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Dear colleagues

In 2023 we brought back our SBTMO (Brazilian Society of Bone Marrow Transplantation and Cellular Therapy) Meeting and XXVI Multidisciplinary Meeting to Curitiba, where they were born. Since the first meeting back in 1996, pioneered by Prof. Ricardo Pasquini, we had very significant growth of the Hematopoietic Stem Cell Transplant (HSCT) field in Brazil, and a consistent development of our Society. Twenty-seven years after, our Society has 1171 associates, an established partnership with ASTCT, EBMT, CIBMTR, LABMT and WBMT, and using the Data Back to Center CIBMTR platform we have developed the Brazilian registry of HSCT. In 2023 we have the 30 th anniversary of REDOME, the Brazilian donor registry, the third biggest in the world. Furthermore, we currently have a well-structured scientific group – GEDECO, which has been intensively productive through the last years, resulting in many papers published in high-impact peer-review journals. More recently, to accomplish our scientific production and growth, Dr. Fernando Barroso Duarte and Dr. Nelson Hamerschlak took the great initiative of creating the JBMTCT, the SBTMO scientific journal, which has been achieving growing importance each year. We were extremely happy to see that in 2023, at the XXVII SBTMO meeting and XXVI Multidisciplinary Meeting we had 221 abstracts submitted, a record accomplishment. Among those, many abstracts of high scientific level will be awarded, presented at the meeting, and published in this issue. That's an example of a Society which has walked on the shoulders of giants to build a mature and promising scientific association that has its place at the world scene of HSCT. In this fertile soil we can see the growth of cellular therapies, the emergence of new supportive measures, more efficient conditioning and immuneprophylaxis regimens. All those innovations tell us thatthe future is now for our SBTMO!

We hope to see all of you in Curitiba for another great meeting!

Vaneuza Funke
President of Annual Meeting SBTMO 2023

Samir Nabhan
Vice President of Annual Meeting SBTMO 2023

Carmem Bonfim
Scientific Director of SBTMO

Fernando Barroso Duarte
President of SBTMO

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AWARDS

MARY FLOWERS AWARD BEST ABSTRACT IN CLINICAL ASPECTS OF HSCT

HAPLOIDENTICAL TRANSPLANTATION USING POST-TRANSPLANTATION CYCLOPHOSPHAMIDE FOR PATIENTS WITH FANCONI ANEMIA: A MULTICENTRIC RETROSPECTIVE STUDY IN BRAZIL

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Introduction: Fanconi anemia(FA) is the most frequent inherited disease bone marrow failure and hematopoietic cell transplantation(HCT) can cure the hematological complications related to this disease. Haploidentical donor transplantation using post-transplantation cyclophosphamide (HAPLO-PTCy) can be an alternative for patients(pts) without matched related or unrelated donors.

Objective: To describe the outcomes of 82 FA pts receiving a HAPLO-PTCy in 6 HCT centers in Brazil, between 2008 and 2023.

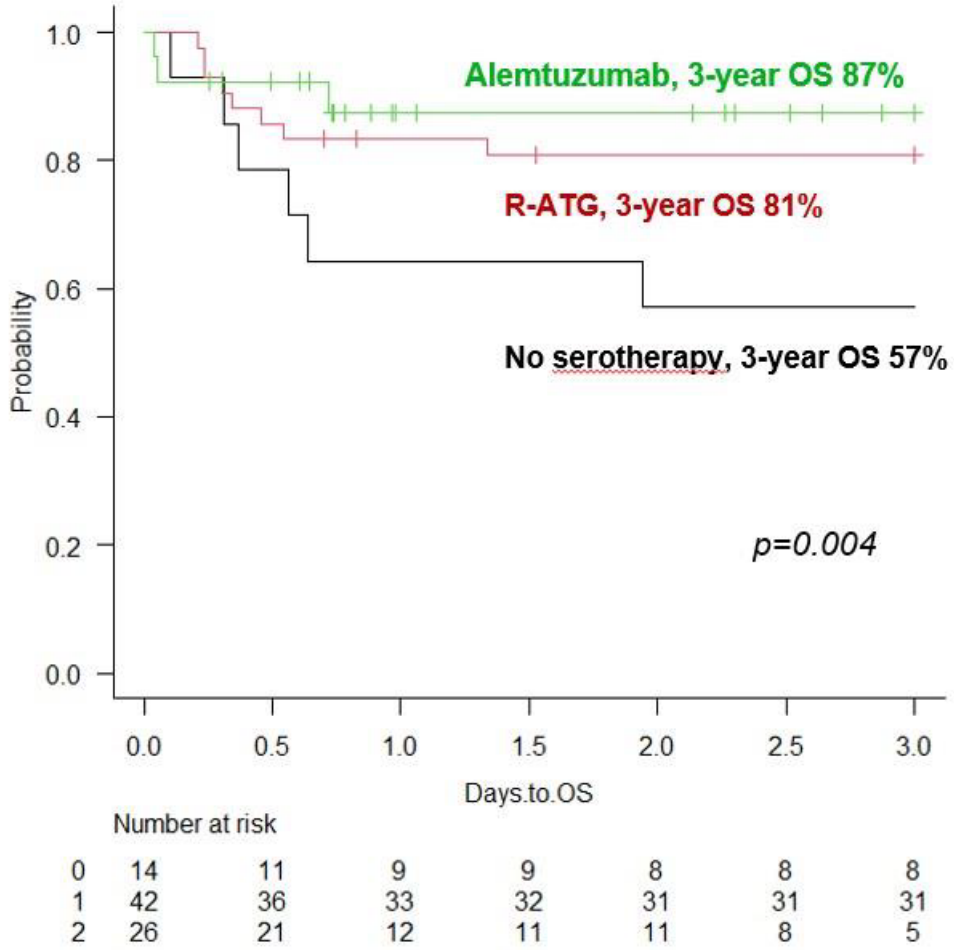
Method: A retrospective, non-randomized, observational study. Database and records were revised, and statistics were performed using the EZR program. 78 pts received a 1st HAPLO-PTCy transplantation, whereas 4 received this procedure after primary or secondary graft failures(GF) from previous related or unrelated HCT. 66% were male, and the median age was 10 years (range;1-44). The majority was CMV positive, 80% had transfusion-dependent aplastic anemia, while 16 had advanced disease (RCMD,n=6; RAEB,n=3; AML,n=7). All received bone marrow from haploidentical donors (father,n=32; mother,n=25; other relatives,n=25) and a modified nonmyeloablative preparatory regimen with a Fludarabine/TBI based regimen without serotherapy (n=14) or with r-ATG(n=42) or Alemtuzumab (n=26). GvHD prophylaxis consisted of a reduced total dose of PTCy(50-60mg/kg) associated with cyclosporine and MMF.

Results: Primary GF or secondary GF occurred in only 3 pts. All received a 2nd Haplo-PTCy BMT, and all died. 1-year incidence of GF was 4% (95%CI: 0.01-0.09). The use of r-ATG or alemtuzumab decreased the day 100 incidence of acute grade 2–4 GvHD (78% to 28%; p<0·0001) and the 2-year incidence of chronic GVHD (78% to 42%; p=0·003. The 100-day incidence of CMV reactivation was 73% (95%CI:0.61 -0.81), and hemorrhagic cystitis was 43%(95% CI: 0.32-0.53). 4 pts, all with chronic GvHD developed oral squamous cell carcinoma between 2-10 years after HCT, one died from progressive disease and the other 3 are currently under treatment. 19 pts died at a median of 134 days after HCT, and the causes of death were GvHD (n=9), infection (n=3), GF (n=3), relapse(n=2), cancer (n=1) and hyperammonemia(n=1). With a median follow-up of 4 years, the 3-year overall survival(OS) for was 78% (95%CI: 0.67-0.86). The 3-year

OS was significantly better for pts receiving serotherapy, 83% vs no serotherapy, 50%; p=0·01. OS was not significantly different according to age of the patient (>= or < 18 years) or disease phase.

Conclusions: There is a learning curve to adapt HAPLO-PTCy for FA in countries with limited resources. This retrospective study shows that HAPLO-PTCy is feasible and associated with excellent survival for FA pts without matched donors. The use of serotherapy (ATG or alemtuzumab) seems necessary to decrease the incidence of GvHD. CMV reactivation is high and lifelong aggressive surveillance for the early detection of cancer is recommended, especially for pts who develop GVHD after HCT.

FIGURE 1: 3-year overall survival according to the use of serotherapy in the preparatory regimen



JÚLIO VOLTARELLI AWARD BEST ABSTRACT
IN CELL THERAPY AND BASIC RESEARCH

IMPROVED IMMUNOREGULATORY MECHANISMS IN PATIENTS WITH SYSTEMIC SCLEROSIS TREATED WITH AUTOLOGOUS HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Systemic sclerosis (SS) is an autoimmune disease characterized by immune dysregulation, vascular damage, and fibrosis of the skin and internal organs. Autologous Hematopoietic Stem Cell Transplantation (AHSCT) has been used as a therapeutic option for patients with severe and progressive forms of the disease. Immunological monitoring studies demonstrate that AHSCT generates a more self-tolerant lymphocyte repertoire, increases immunoregulatory mechanisms, and promotes a more anti-inflammatory profile in patients with autoimmune disorders. However, these investigations require further detail.

Objective: In this study, we evaluated the expression of FOXP3 in regulatory T subpopulations (Tregs) before and after AHSCT and serum levels of interleukin (IL)-10.

Methods: Peripheral blood mononuclear cell (PBMC) samples from 10 SSc patients were evaluated by flow cytometry, and their results were retrospectively correlated with clinical data up to 3.5 years after AHSCT. Frequency and median fluorescence intensity (MFI) were evaluated on Treg expressing CD3, CD4, CD25, CD45RA, and FOXP3. Serum samples were assessed for IL-10 concentrations by the Multiplex assay.

Results: Most participants were female (80%) with a mean age (standard deviation, SD) of 35.9 (11) years. The clinical evaluation of fibrosis, by the modified Rodnan score (mRSS), improved at 6, 12, and 24 months compared to the pre-transplantation period ($p<0.0001$). Median FOXP3 fluorescence intensity increased at 30 months after transplantation compared to pre-transplant ($p>0.05$) in effector/activated Tregs (CD45RA–FoxP3highCD4+). Serum IL-10 levels increased at 12 ($p>0.05$), and 24 months ($p>0.01$) after AHSCT compared to the pre-transplant period.

Conclusion: Our study demonstrated that, after transplantation, there is an increase in the levels of IL-10, an important cytokine with anti-inflammatory properties, and an increase in the expression of FOXP3 in effector regulatory T cells, which have strong immunosuppressive activity. Thus, we believe that these results reflect the therapeutic action of the transplant in generating a change in the autoimmune and inflammatory profile in patients with systemic sclerosis.

Keywords: Systemic sclerosis, Autologous Hematopoietic Stem Cell Transplantation, Immunoregulation

Suporte financeiro: FAPESP, CAPES, CNPQ, FUNDAÇÃO HEMOCENTRO-RP, HCFMRP-USP.

FANI JOB AWARD BEST MULTIDISCIPLINARY ABSTRACT

RELATIONSHIP BETWEEN SARCOPENIA AND CLINICAL ASPECTS IN HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Hematopoietic stem cell transplantation (HSCT) emerges as a therapeutic modality for hematopoietic, oncological, hereditary and immunological diseases, malignant or not, in order to restore the normal production of blood cells. Adverse effects of treatment (dysgeusia, dysphagia, odynophagia, xerostomia and mucositis) impact food intake and may cause weight loss. Sarcopenia, a progressive and generalized skeletal muscle disorder, is associated with an increased probability of unwanted results and is one of the ways to assess nutritional impairment, constituting a risk factor for hospitalized cancer patients, as it increases the chance of mortality and of clinical complications. Thus, nutritional status (NS) is an independent risk factor for HSCT.

Aim: To evaluate sarcopenia in HSCT relating it to clinical and nutritional aspects. Methodology: Cross-sectional, observational study with a quantitative approach, carried out in a hospital in the Brazilian Northeast. Sample consisting of patients hospitalized for autologous HSCT (≥ 18 years old) of both sexes. The EN was assessed by anthropometric data: weight, height, waist circumference (WC) and hip circumference (HC). Body Mass Index (BMI) and Waist-Hip Ratio (WHR) were calculated. Sarcopenia was classified considering the EWGSOP by low muscle density and function. For continuous or discrete variables, measures of central tendency and dispersion were calculated, and for categorical ones, simple and relative frequencies. The Kolmogorov–Smirnov test was used to assess normality. Associations between variables were verified using the Chi-square or Fisher's exact tests or Student's t test and others (5% significance level).

Results: Sample composed of 58 patients, 53% (n=31) male and 47% (n=27) female, most of whom were adults (69% (n=40) with a mean age of 51 years). The most prevalent pathologies were Multiple Myeloma (MM) 61% and Non-Hodgkin's Lymphoma (NHL) 23%. Regarding nutritional parameters, sarcopenia was found in 16% of the sample, being higher in the group of individuals aged >60 years (p=0.022). It was also found that the majority, 59% (n=34), were overweight according to BMI and at high risk for developing cardiovascular diseases (CVD) according to WC and WHR, (62% n=36; 55% n =31), respectively.

Conclusion: The prevalence of sarcopenia in patients undergoing HSCT was moderate, being higher among individuals aged >60 years, indicating an association between sarcopenia and age. It was also found that most patients were overweight and at high risk for developing CVD. Given the relevance of the topic and the scarcity of studies, additional research is needed to identify and manage sarcopenia.

Keywords: Hematopoietic Stem Cell Transplantation; Obesity; Sarcopenia.

RICARDO PASQUINI AWARD YOUNG SCIENTIST
BEST AUTHOR ABSTRACT WITH AGE EQUAL OR UNDER 35

DESCRIPTION OF CLINICAL AND LABORATORY CHARACTERISTICS OF PATIENTS UNDERGOING ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION ACCORDING TO THE ABO BLOOD GROUP IN A TERTIARY HOSPITAL IN SOUTHERN BRAZIL

Ebellins Tabares Calvache[1], Juliana Pires Marafon Franz [2], Cristiane Seganfredo Weber[1], Júlia Plentz Portich[1], L. Esteves Daudt[1,3], Alessandra Aparecida Paz[1], Juliana Pires Marafon Franz[1], Claudia Caceres Astigarraga[1,3]

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Introduction: Allogeneic hematopoietic stem cell transplantation (Allo-HSCT) is the only potentially curative treatment for several malignant and benign diseases. Among patients undergoing this therapy, 30-50% have ABO incompatibility, which can lead to complications such as pure red cell aplasia and/or delayed erythroid engraftment, which translates into a greater need for red blood cell transfusion, iron overload and alloimmunization.

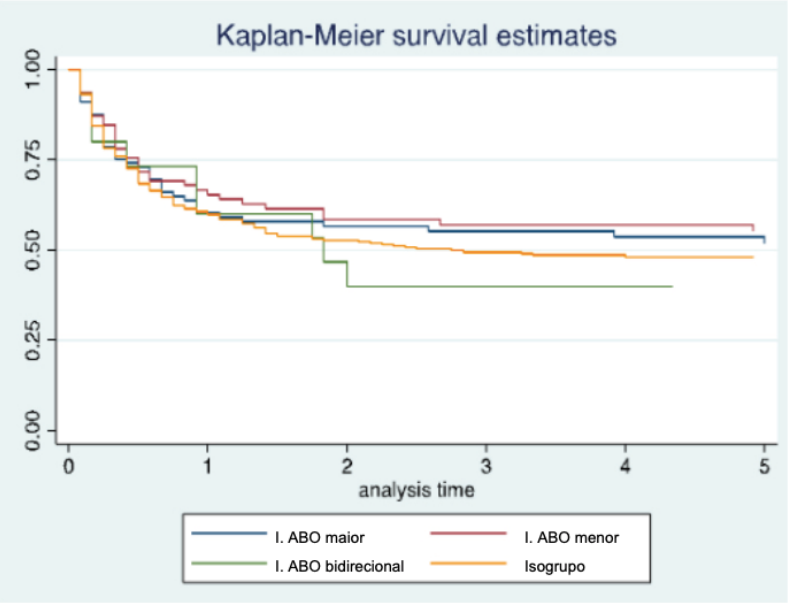
Objective: To describe the main clinical and laboratory conditions and transfusion requirements of patients undergoing HSCT according to ABO blood group in a tertiary hospital in southern Brazil, besides the main associated complications.

Methods: From November 1th, 1994 to May 31th, 2021, all pediatric and adult patients who underwent Allo-HSCT, carriers of malignant and benign diseases, using related, unrelated and haploidentical donors were retrospectively evaluated. Identification of patients' demographic, clinical and transfusion information was performed through medical records. Continuous variables were described as median, categorical variables as n(%) and compared using Fisher's exact test or x^2. To compare independent continuous variables, the t-student or Mann–Whitney test was applied. The significance level was $p < 0.05\%$.Outcomes: Primary: describe overall survival (OS), defined as the number of days between infusion and death from any cause among ABO blood groups; secondary: description of clinical complications associated with ABO incompatibility, such as primary neutrophilic engraftment failure and pure red cell aplasia, and its association with acute GVHD (Graft versus Host Disease).

Results: In this cohort of 543 patients undergoing Allo-HSCT, 35.9% of transplants presented with ABO incompatibility, of which 17.7% were major, 14.9% minor and 3.3% bidirectional. There was no statistical difference in acute GVHD or overall survival (OS) when comparing with the isogroup cohort. Pure red cell aplasia was diagnosed in three patients with major ABO incompatibility (3.1%), and did not occur among isogroup patients. There was a greater incidence of engraftment failure among transplants with ABO incompatibility (vs) isogroup transplants (p=0.038).

Conclusions: In our cohort, ABO incompatibility was not associated with more severe outcomes, such as acute GVHD and overall survival, but all cases of pure red cell aplasia were diagnosed in patients with major ABO incompatibility, a complication that, despite not being properly associated with death, brings great morbidity to the patient. Furthermore, the incidence of graft failure was higher among patients with ABO incompatibility.

FIGURE 1: Overall survival (OS) between isogroup and ABO incompatibility patients



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CARMEM BONFIM AWARD BEST ABSTRACT IN THE PEDIATRICS AREA

ALLOGENIC HEMATOPOIETIC STEM CELL TRANSPLANTATION IN PEDIATRIC PATIENTS WITH ACUTE LYMPHOBLASTIC LEUKEMIA: A BRAZILIAN RETROSPECTIVE AND MULTICENTRIC STUDY

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Introduction: Acute lymphoblastic leukemia (ALL) is the main type of cancer in childhood, with overall survival overt to 90%. It is the most common indication for allogeneic Hematopoietic Stem Cell Transplantation (HSCT) in pediatrics and may represent the main curative therapeutic option for patients at high risk of relapse.

Goal: To evaluate the epidemiological profile and outcome of pediatric patients with ALL undergoing HSCT in five centers in Brazil.

Casuistic: A total of 439 patients aged up to 18 years who underwent HSCT for ALL between January 2010 and June 2020 with a median follow-up of 31 months were included.

Method: Multicentric retrospective cohort study data was collected from medical records. The variables analyzed were age, sex, ethnicity, clinical and transplant characteristics and post-HSCT complications. Outcomes evaluated were overall survival and event-free survival, non-relapse mortality and its causes.

Results: Among the 439 patients undergoing HSCT, the majority (69%) were male and B cell ALL was predominant (78.9%). The median age at HSCT was 9 years old (p25: 6; p75: 13). 38.7% were transplanted in first complete remission (1CR), 44.2% in second remission (2CR), and the remaining in third remission or with active refractory disease (3CR). 25.9% of pa-

tients had positive minimal residual disease before HSCT. 97.7% underwent a myeloablative conditioning regimen, 87% included Total Body Irradiation (TBI). The main stem cell source was bone marrow (82.6%). Regarding the donor type, 49.9% of the transplants were unrelated matched donors, 31.2% matched sibling donors and 18.9% haploidentical. The main graft versus host disease (GVHD) prophylaxis was cyclosporine plus methotrexate (70.2%). 46.1% of patients had acute GVHD, with 33.1% having grade III and IV disease. 25.5% had chronic GVHD, of which, 20% had severe disease. Cytomegalovirus reactivation occurred in 49.1% of patients within the first 100 days. Overall survival was 52.4% at 5 years (70.2% 1CR; 46.6% 2RC; 29.3% 3RC). Non-relapse mortality was 37.3%. Among patients undergoing haploidentical HSCT, disease-free survival was 49.25% (p 0.036).

Conclusion: Through the present study, we describe the results of HSCT in children with acute lymphoblastic leukemia treated in recent years in large centers in our country, thus allowing comparison with international data and discussion of better care strategies.

Keywords: Acute Lymphoblastic Leukemia. Bone Marrow Transplant. Pediatrics.

NELSON HAMERSCHLAK AND MARCELO PASQUINI AWARD

BEST ABSTRACT IN THE DATA MANAGEMENT AREA

IMPACT OF NATIONAL STRATEGIES ON THE ADHERENCE OF CELLULAR THERAPY CENTERS TO MULTICENTER DATA REGISTRIES

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Introduction: Data reporting on hematopoietic stem cell transplants (HCT) using multicenter data registries is crucial for understanding outcomes and the quality of services. In Brazil, the Brazilian Society of Cellular Therapy and Bone Marrow Transplantation (SBTMO) and the HCT Data Managers Working Group (GTGD) from the SBTMO have developed strategies to encourage centers to register their productivity in multicenter databases (Figure 1).

Objective: To describe the impact of national strategies on the adherence of Brazilian HCT centers to report to multicenter data registries.

Methods: Brazilian HCT data registered in the databases of the Brazilian Association of Organ Transplants (ABTO), Center for International Blood and Marrow Transplant Research (CIBMTR), and Latin American Bone Marrow Transplantation Group (LABMT) were obtained from 2010 to 2022 at their respective platforms (and 2019 for LABMT as this data base platform is undergoing a system migration). As of 2016, the SBTMO and the GTGD intensified strategies to improve the report of Brazilian HCT to the CIBMTR.

Results: According to the ABTO, between 2016 and 2022 there was an 83% increase in the number of HCTs reported (from 2187 to 3991) and 82% increase in allogeneic transplants (alloHCT) for the same period (from 802 to 1462). Additionally, the number of participating centers increased from 49 to 83. An increase of 171% was observed in the HCT reported to the CIBMTR (from 615 to 1668), with 104% increase observed for alloHCT (373 to 761). Moreover, the number of active centers reporting to CIBMTR increased from 11 to 34. The number of HCTs reported to the LABMT increased 19% (1960 in 2016 and 2334 in 2020) with more centers reporting their data to this registry (from 32 to 38). The increment for alloHCT was 32% (793 to 1046), (Figures 1 and 2).

Conclusion: The percentage of cases reported at ABTO, CIBMTR and LABMT was higher over time, especially from 2016, suggesting that the efforts of SBTMO and GTGD had a significant impact. The implementation of the national HCT registry using the CIBMTR infrastructure has enabled scientific production and the conduction of multicenter studies. Furthermore, data managers training, and recognition have impacted in the quality and reliability of the data, as the representation of Brazilian professionals in international committees, sharing our experience to improve the Latin America HCT registry. Strategies like these are important, since the knowledge of HCT outcomes helps to support public health policy decision making, leading to improvements in HCT quality and patient outcomes.

Keywords: Data Management. Database. Hematopoietic Stem Cell Transplant.

FIGURE 1. SBTMO and GTGD's actions and strategies

FIGURE 2. Number of HCTs registered with ABTO, CIBMTR and LABMT (LABMT data from 2019-2022 is currently being collected)

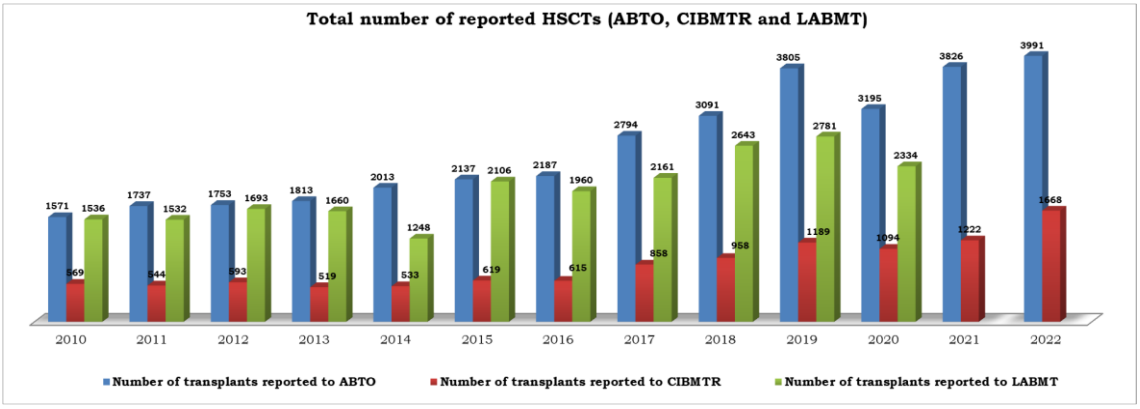
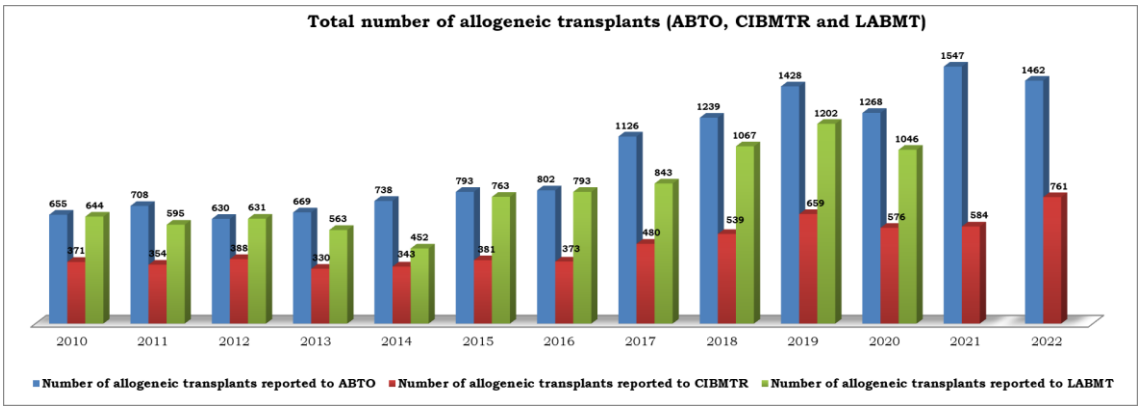


FIGURE 3. Number of allogeneic HCTs registered with ABTO, CIBMTR and LABMT (LABMT data from 2019-2022 is currently being collected)



ALIRIO PFIFFER AWARD BEST ABSTRACT IN BONE MARROW FAILURE SYNDROMES

COMPARISON OF OUTCOMES AFTER MATCHED RELATED, UNRELATED AND HAPLOIDENTICAL DONOR BONE MARROW TRANSPLANTATION FOR PATIENTS WITH ACQUIRED APLASTIC ANEMIA: A MULTICENTER RETROSPECTIVE ANALYSIS OF REAL-WORLD EXPERIENCE IN BRAZIL

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Introduction: Severe Aplastic Anemia(SAA) is the most frequent indication for Hematopoietic cell transplantation(HCT) for nonmalignant diseases in Brazil. Survival after HCT from HLA-matched related(MRD), HLA-matched unrelated(MUD), and haploidentical donors(HID) has improved over the past decades.

Objective: We aimed to compare the outcomes of a large cohort of patients(pts) submitted to HCT for acquired SAA in Brazil.

Methods: A retrospective, non-randomized study included 328 pts with acquired SAA who underwent HCT in 5 Brazilian HCT centers between 01/2012 and 12/2022. All pts received bone marrow as the graft source from MRD(n=154), MUD(n=96), or HID(n=78). MUD was defined as HLA 10/10 or 8/8.

Results: Pts and donors' characteristics are summarized in Table 1. Median follow-up after HCT was 4,7 years. Median age was 18,4 years(1-69 years), most were CMV positive and heavily transfused. 74% had received previous immunosuppression with(n=109) or without Rabbit-ATG(n=134). Median disease duration before transplant was 7 months (0,6-184), however pts with a MRD were transplanted earlier. There were some statistical differences among groups: HID were performed more recently and ATG was more frequently used in MUD. Conditioning regimen and GVHD prophylaxis were also different among donor groups. One-year cumulative incidence of graft failure (GF) in MRD, MUD, and HID cohort was 4,8%, 10,8% and 18,1%(p=0,0028), respectively. 27 pts were rescued with a 2nd transplant (MRD,n=7;MUD,n=8;HID,n=12) at a median of 40 days after 1st HCT, and 14 are alive. In a multivariate analysis(MVA), MUD-HCT (HR:2.35,p=0.078) and HID-HCT (HR:4.30,p=0.0012) were associated with a higher incidence of GF (Table 2). MRD-HCT had a lower incidence of grade II–IV acute graft versus host disease (aGvHD) compared with MUD and HID (12,4% vs 30,3% vs 16,9%,p=0,00175) and lower incidence of chronic GvHD (cGvHD)(8,7% vs 26,9% vs 27,2%,p=<0,001).The estimated non adjusted 5-year overall survival(OS) for the MRD, MUD, and HID groups were 86%, 72% and 79%(p=0.02),

respectively; event-free survival (event: rejection or death) rates were 85%, 68% and 56%, respectively(p<0.001)(Fig. 1 and 2). In MVA, OS was increased for transplantations after 2018 (HR:0.38,p=0.002) (Fig. 3). MUD-HCT (HR:3.13,p=<0.001) and HID-HCT (HR:2.97,p=0.0039) were associated with decreased OS in comparison to MRD-HCT. The 100-day CI of CMV reactivation and hemorrhagic cystitis were 56% and 8% respectively, with no significant differences between groups. 64 pts died at a median of 102 days (range 2–2328), and the main causes of death were GF,n=20;sepsis,n=11;GvHD,n=9.

Conclusion: These real-world data from a large cohort of SAA pts demonstrate that HCT remains an effective curative treatment with significant improvement in survival in the last 5 years across different donor groups. Improved OS in HID-HCT comes at the expense of higher rates of graft rejection and higher rates of aGvHD remain an issue after MUD-HCT.

TABLE 1: Demographics and major transplant outcomes

VARIABLES	TOTAL N= 328	MATCHED RELATED N=153	MATCHED UNRELATED N=97	HAPLOIDENTICAL DONORS N=78
Age: Range, years (Median) . Younger than 18 years-old . 18-years old or above	1,0 - 69 (18,4) 48,2% 51,8%	2,0 - 62 (23) 40,5% 59,5%	1,0 - 52,4 (18,1) 48,5% 51,5%	1,8 - 69 (13,1) 71,8% 28,2%
Disease duration: range; months (Median)	0,6 – 184 (7)	0,6 - 82,2 (4)	1,4 - 184,1 (13,6)	1,5 - 179,8 (9,6)
ABO incompatibility n (%) . No . Minor/major	204 (62) 123 (38)	100 (65) 53 (35)	51 (53) 45(47)	53 (68) 25 (32)
Donor Age: range (Median)	1 – 59 (29)	1 – 59 (23)	20 – 53 (30)	10 – 57 (34)
Year of BMT . 2012 – 2017 . 2018 - 2022	179 149	99 54	63 34	17 61
Prep regimens . CY + /- ATG . BU + CY/FLU +/-ATG . CY+FLU+/- ATG +/-TBI (200-400)	47 119 161	47 66 40	0 53 44	0 0 77
ATG in the preparatory regimen n (%)	176 (53,6%)	64 (41,8%)	91 (93,8%)	21 (26,9%)
GVHD prophylaxis . CSA + MTX . PTCy + CSA + MMF . Other	233 88 7	147 0 6	86 10 1	0 78 0
TNC x 10*8/kg infused: range (Median)	1,2 - 11,8 (4,0)	1,2 - 11,2 (3,7)	1,5 - 11,8 (3,8)	2,2 - 11,0 (5,5)
Engraftment: days, range(M) . Time to ANC>500/ul, . Time to platelet >20.000/ul,	11 - 52 (18) 7 - 203 (21)	12 - 52 (19) 9 - 153 (20)	11 - 46 (18) 7 - 203 (22)	13 - 37 (16) 16 - 200 (21)
Survival . 5-year OS (95% CI)	80,4% (0.75-0.84)	89,1% (0.82-0.93)	67,4% (0.56-0.75)	80,5% (0.69-0.87)
Graft failure (GF): n; evaluable pts . Primary GF: . Secondary GF/poor graft function . 1y GF, % (95% CI)	N = 319 15 16 9,8% (0.06-0.13)	N = 150 1 6 4,8% (0.02 - 0.09)	N = 92 4 6 10,8% (0.05 - 0.18)	N = 77 10 4 18,1% (0.10 - 0.27)

Second transplants, n . Time to second transplant, days, range (Median)	26 37 - 834 (49)	7 43 - 536 (224)	7 37 - 834 (45)	12 37 - 115 (44)
GvHD . 100-days grade II-IV acute GvHD, % (95% CI) . 2-year CI of Chronic GvHD, % (95% CI)	18,7% (0.14-0.23) 20,3% (0.16-0.24)	12,4% (0.07 - 0.18) 8,7% (0.04 - 0.13)	30,3% (0.21 - 0.39) 26,9% (0.18 - 0.36)	16,9% (0.09-0.26) 27,2% (0.17 - 0.37)
100-day CI of CMV reactivation, %, (95% CI)	56,7 % (0.51-0.69)	49% (0.40 - 0.56)	63,9% (0.53 - 0.72)	62,8% (0.50 - 0.72)
Deaths, number of patients Days after HCT range (Median)	N=64 2 – 2328 days (102 days)	N=18 5 - 2328 days (175 days)	N=31 2 - 1322 days (87 days)	N=15 16 - 270 days (83 days)
Median follow-up, years	4,7	5,2	5,1	2,5

TABLE 2: Multivariate Analysis for OS and GF

VARIABLE	HR (95% CI)	P VALUE
1-year OS		
MUD-HCT	2.35 (0.91- 6.09)	.078
HID-HCT	4.30 (1.78-10.38)	.0012
1-year Graft failure		
Year of BMT ≥ 2018	0.38 (0.20-0.70)	.002
MUD-HCT	3.13 (1.74-5.61)	.00014
HID-HCT	2.97 (1.42-6.21)	.0039

ASTCT-SBTMO AWARD: BEST ABSTRACT OF YOUNG INVESTIGATOR

UPFRONT HLA-HAPLOIDENTICAL STEM CELL TRANSPLANTATION WITH POST-TRANSPLANTATION CYCLOPHOSPHAMIDE (HAPLO-PTCY) IN 205 PEDIATRIC PATIENTS WITH NON-MALIGNANT DISEASES

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Introduction: Hematopoietic cell transplantation (HCT) is the treatment of choice for many nonmalignant diseases (NMD). HLA-haploidentical cell transplantation with post-transplantation cyclophosphamide (HAPLO-PTCy) is an important option for patients lacking matched related or unrelated donors, especially in resource-limited countries.

Objective: To analyze the outcomes of pediatric patients with NMD submitted to an upfront HAPLO-PTCy in 3 pediatric HCT centers in Brazil.

Patients and Method: This retrospective study reports the outcomes of 205 children with NMD diseases who received an upfront HAPLO-PTCY between April-2008 and December-2022 in 3 pediatric HSCT centers. Databases and records were revised, and statistics were performed using the EZR program. Median age was 7 years (0.2 months – 17.5 years) and 73% were male. Preparatory regimens varied according to the disease type and are described in Table 1 along with other HSCT details.

Results: Primary graft failure (GF) occurred in 14 (6,8%), while 12 (5,8%) developed secondary GF. The 28-day incidence of neutrophil recovery was 96,8% (95%CI: 92,7-98,6). One-year incidence of GF was 11.7% (95%CI: 7.8-16.5), 25 patients were rescued with a 2nd transplant and 15 are alive. The 100-day incidence of any grade acute-GvHD was 29.2% (95%CI: 23.1-35.6) and 2-year incidence for chronic-GvHD was 18.5% (95%CI: 13.4-24.2).

The 1-year and 3-year event-free survival (EFS defined by graft failure or death) were 75.9 (95%CI: 69.4-81.2) and 69.7% (95%CI: 62.4-75.6), respectively. Forty-eight patients died and the main causes of death were infections, GvHD and GF. The 100-day CMV reactivation was 60.8% (95%CI:53-67) and the 100-day CMV reactivation was 60% (95%CI:53-67) and the 100-day incidence of hemorrhagic cystitis was 20% (95%CI:14-26). After a median follow-up of 28 months, the 1- and 3-year overall survival (OS) was 83.7% and 76.1% (95%CI: 0.690-0.818). There was no difference in OS according to the disease groups: acquired aplastic anemia: 89.7% (95%CI: 74.9-96); inherited bone marrow failures: 73.5% (95%CI: 60.5-82.8); immunodeficiencies 70.5% (95%CI: 58.2-79.8); other NMD: 88.2% (95%CI: 60.6-96.9). At 30-days, of all patients evaluated for donor chimerism (n=187) 85% sustained a complete donor chimerism.

Conclusions: This is one of the largest experiences using HAPLO-PTCy for children with NMD worldwide. This study demonstrates that PTCy can be successfully used to treat patients with a variety of non-malignant disorders. It is effective across all disease groups and associated with high rates of engraftment and overall survival and low rates of GVHD. Although results have improved, some challenges remain. These include viral reactivation for the whole cohort, graft failure, hepatic sinusoidal obstructive syndrome and acute and chronic GvHD for some specific disease subtypes.

TABLE 1: Diagnoses and HSCT details.

Disease Type, n (%)	Acquired aplastic anemia 39 (19%)	Aplastic Anemia (39)
	Inherited BMFS 72 (35,1%)	Fanconi Anemia (54) Congenital Dyskeratosis (7) Congenital amegakaryocytic thrombocytopenia (3) Blackfan Diamond Anemia (1) MECOM (1) Other congenital BMF (5)
	Immunodeficiencies 77 (37,5%)	SCID (41) Wiskott Aldrich (22) Congenital Neutropenia (1) CD40L deficiency (1) Chediak Higashi (4) XIAP (3) HLH (2) CGD (2) IPEX (1)
	Others 17 (8,2%)	Adrenoleukodystrophy (11) Sickle Cell Anemia (4) Osteopetrosis (2)
ABO Matching, n (%)	ABO incompatibility	79 (38,5)
CMV patient, n (%)	Positive	188 (91.7)
Donor Type, n (%)	Father Mother Sibling Other	128 (62.4) 48 (23.4) 24 (11.7) 5 (2.4)
DSA status, n (%)	Negative DSA	193 (94.1)
	Positive DSA	12 (5.8)
Preparatory regimens	TBI based (100 - 400 cGy)	118 (57.5)
	Busulfan based	77 (37.5)
Serotherapy	+ ATG or Campath	143 (69.7)
GVHD prophylaxis	PTCY 100mg/kg + CSA + MMF	146 (71.2)
	PTCY 50-60mg/kg + CSA + MMF	53 (25.8)
	PTCY 100mg/kg + sirolimus/MTX	6 (3)
CD34 (x106 /kg), median (range)		4.8 [1.2, 20.0]
TNC (x108 /kg), median (range)		6.5 [2.2, 25.0]
HSC Source, n (%)	Bone Marrow Peripheral Blood	198 (96.5) 7 (3.5)

ORAL PRESENTATIONS

ALOGENEIC HSCT

APPLICATION OF A GERIATRIC SCORE IN OLDER ADULTS SUBMITTED TO AN ALLOGENEIC BONE MARROW TRANSPLANTATION. A RETROSPECTIVE ANALYSIS.

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Introduction: In the last decades the number of older adults submitted to an allogeneic transplant continue increasing worldwide. The population is heterogeneous and accumulates comorbidities, to better assess who will benefit from the transplant, the comprehensive geriatric assessment and its tools are commonly used.

Objective: evaluated in two Brazilian center the use of geriatric score (GS) and outcomes in predicting OS.

Casuistic: we evaluate retrospectively the geriatric score used at Hospital Universitario Walter Candidio (HUWC) and in the Hospital Israelita Albert Einstein (HIAE) patients that got a geriatric assessment between 2018 to 2023.

Methodology: evaluation of GS that use 10 geriatric tools (AIDL, polypharmacy, falls, hospitals' admission, cognition, nutrition, social support, gait speed, and self-health evaluation) in the HUWC and In the HIAE data were collect from a complete geriatric assessment and translated to GS. Statistic analysis were done with Fisher exact test, chi-square test, logtank, and kappaln-meier for survival

Results: Between 2018-2023 The Hospital Universitario Walter Candidio evaluate 53 patients 50 years old with a geriatric score. The Hospital Israelita Albert Einstein evaluate 58 patients 60 years old with complete geriatric assessment. Retrospectively was only possible apply the GS in 29 patients from HIAE and that was used in the analyses together with 53 patients from HUWC. Table 1 summarize the Demographic data. Thirty (56%) of HUWC patients went to transplant in contrast to 100% in HIAE. Related to patients that do not transplanted 69% were due comorbidities and 13% early death. The HUWC population was younger (67% - 50-59 yo) than HIAE in witch 65,5% were older than 65yo. There were no difference in the geriatric score between centers. The OS was 68% in 2 years. Comparing the GS survival low risk went worse than inter/high risk (p=0,09). We have a lot of limitation, first it's a retrospective study based in equivalence of tools used in the GS what can cause misinterpretation. Second we have a low number of patitens analysed, furthermore patients with more cormobidities do not receive transplant in one center and more patiets wirh cormobidities were transplanted in other what can be a confouder. Related to the GS difference survival curve one explanation could be that intervention were done when a disability was found mitigating deaths.

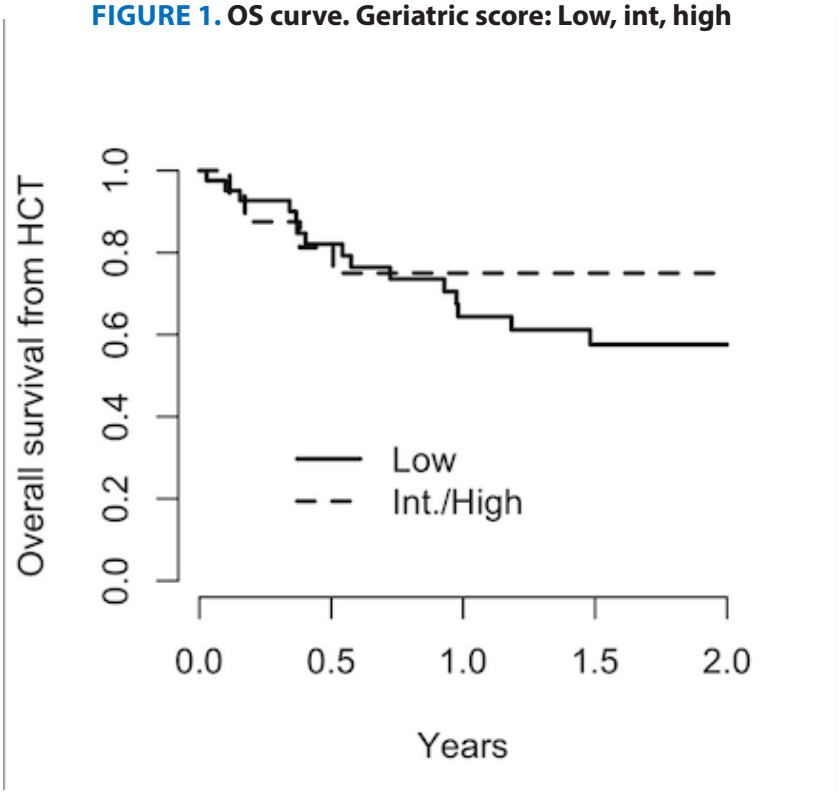
Conclusion: The GS was not able to predict OS in our retrospective study. A multicentric randomizes study using geriatric assessment and it tools in the geriatric population submitted to bone marrow transplantation is warranted to better define who can benefit from transplant

TABLE 1. Demographic data

	HUWC	HIAE	P value
Total	53	29	
AGE			< 0.001
50-59	35 (67.3)	0 (0)	
60-64	6 (11.5)	10 (34.5)	
65-70	9 (17.3)	8 (27.6)	
>70	2 (3.8)	11 (37.9)	
SEX			0.986
M	33 (62.3)	18 (62.1)	
F	20 (37.7)	11 (37.9)	
HCT- CI	13	29	< 0.001
1	13 (100)	12 (41.4)	
2	0 (0)	5 (17.2)	
3	0 (0)	12 (41.4)	
Diagnosis			0.117
LMA	16 (30.2)	17 (58.6)	
MM	0 (0)	1 (3.4)	
Linfoma	3 (5.7)	0 (0)	
SMD	14 (26.4)	8 (27.6)	
Mielofibrose	4 (7.5)	2 (6.9)	
LLC	2 (3.8)	0 (0)	
LLA	9 (17)	1 (3.4)	
LMC	3 (5.7)	0 (0)	
AAG	1 (1.9)	0 (0)	
Neo Celulas plamablasticas	1 (1.9)	0 (0)	
DRI			0.05
Low	0 (0)	1 (3.4)	
Inter	5 (17.9)	13 (44.8)	
high	15 (53.6)	12 (41.4)	
very high	8 (28.6)	3 (10.3)	
Geriatric score			0.076
Low	31 (58.5)	24 (82.8)	
Inter	12 (22.6)	2 (6.9)	
high	10 (18.9)	3 (10.3)	
HSCT			< 0.001
0	30 (56.6)	29 (100)	
1	23 (43.4)	0 (0)	
Tipo TMO			< 0.001
Related	19 (76)	6 (20.7)	
Not related	2 (8)	15 (51.7)	

Haplo	4 (16)	8 (27.6)	
Intensidade.Condicionamento			1
RIC	17 (85)	25 (86.2)	
MAC	3 (15)	4 (13.8)	
Condicionamento			< 0.001
Buflu	13 (24,5)	1 (3.4)	
Flumel	1 (4.2)	0 (0)	
Flu/Mel/TBI/ciclo pos	0 (0)	2 (6.9)	
BuTiotepa/ciclo pos	0 (0)	1 (3.4)	
BuFluTMI +ATG	0 (0)	9 (31)	
BuFlu + ATG	2 (3,7)	7 (24.1)	
Flu Mel ATG	0 (0)	1 (3.4)	
BuFlu TMI	0 (0)	2 (6.9)	
Flumel + Tbi + RTX esplênica	0 (0)	1 (3.4)	
BuFluTMI + Cyclo pos	0 (0)	3 (10.3)	
FluTBI/ciclo pos	0 (0)	2 (6.9)	
Buflu ciclo pos	4 (16.7)	0 (0)	
Buciclo	3 (12.5)	0 (0)	
Flucy/ATG	1 (4.2)	0 (0)	

FIGURE 1. OS curve. Geriatric score: Low, int, high



BACK TO THE FUTURE: 20 YEARS FOLLOW UP OF ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT) FOR CHRONIC MYELOID LEUKEMIA PATIENTS RESISTANT TO TKI

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Background: The management of chronic myeloid leukemia (CML) has changed over the last two decades after the introduction of tyrosine kinase inhibitors (TKI). The majority of patients treated with TKIs achieve excellent responses. However, some of them do not achieve molecular response due to treatment failure. The definition of treatment failure is characterized by both resistance to medication and intolerance to side effects. For patients who fail to TKIs, hematopoietic stem cell transplantation (HSCT) continues to be considered an effective and potentially curative therapy. HSCT should be indicated for patients resistant or intolerant to two or more TKI and for patients progressing to the accelerated or blastic phase. However, there is a lack of data from literature about results of transplants performed after TKI failure.

Objectives: this study aims to determine overall survival of CML patients who received HSCT after TKI failure in a reference center in Brazil. As secondary objectives we studied relapse rate, non-relapse mortality and cumulative incidence of acute or chronic GVHD.

Patients and Methods: The study is retrospective, observational, and analytical, held from data record in either STMO database or medical chart. Survival Curves were performed using Kaplan Meier Method and Fisher exact test was used for categoric variables. EZR was used for statistical analysis.

Results: we analyzed 70 patients with the diagnosis of CML resistant to TKIs transplanted at a single BMT Center in Brazil, from January 2001 to May 2019. Median age was 38 years (10-60). There were 46 male (66%). Fifty-five patients were in CP (79%), 8 in AP and four patients in blast phase. Nineteen patients (27 %) had mutations identified. Thirty-three pts received HSCT from unrelated and 37 from related donors. Marrow was used as graft source for 37 patients and 33 remaining received peripheral blood. Median Survival for the whole cohort was 11 years; being 1-year OS: 70% (57,8-79,3), 5-year OS: 57,7 % (45,1-68,5) and 10-year OS: 51,4% (38,3-63,1). Five years estimated overall survival was no different for CP1 (60%) versus for advanced phases (45%); p=0,6. Cumulative incidence of non-relapse mortality (NRM) at 100-days: 12,9% (6,3-21,9) and at 1-year: 21,4 % (12,7-31,7). Cumulative incidence of acute GVHD (aGVHD) at 100-days: 34,3% (23,4-45,5) and of cGVHD at 1-year: 34,3% (23,3-45,5). Cumulative incidence of cGVHD at 2-years: 35,7% (24,6-47,0). Regarding to relapse rates at 1-year, cumulative incidence of relapse was 27,1 % (17,3-38) and at 2-years 34,3 (23,4 - 45,5).

Conclusions: Stem cell transplant can be used effectively for achieving long term survival in patients with CML who failed TKI therapy. Considering that best results are reached when patients are still in chronic phase is very important to evaluate the best time to indicate HSCT.

CLINICAL VALIDATION OF FLOW CYTOMETRY 10 COLOR PANEL FOR MEASURABLE RESIDUAL DISEASE IN ACUTE MYELOID LEUKEMIA: PRELIMINARY RESULTS

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Introduction: Measurable residual disease (MRD) is an important biomarker for predicting relapse in acute myeloid leukemia (AML) patients in pre- and post-hematopoietic stem cell transplantation (HSCT) settings. Besides the wide applicability of multiparametric flow cytometry (MFC) in AML MRD, the use of a greater number of fluorochromes in appropriate combinations can improve the sensitivity of the method, but requires the implementation of rigorous standardization of laboratory processes to ensure reliable results for clinical use. In addition, MRD protocols must be clinically validated to prove their effectiveness.

Objective: the aim of this study was to evaluate the effectiveness of a validated MFC protocol using a 10-color panel for detecting MRD in AML patients undergoing HSCT.

Patients and methods: we analyzed the outcomes of 49 patients with non-APL AML, aged 16 to 69 years, with MRD evaluation by the MFC protocol from April 2021 to December 2022. Patients included in the cohort should have had at least 4 months of follow-up after the last MRD evaluation or who had died of leukemia relapse before this period. 49 and 43 patients had pre- and post-HSCT MRD evaluation, respectively. Six patients died of transplant related mortality (TRM) and had no post-HSCT MRD evaluation. The databases of the flow cytometry laboratory and the bone marrow transplant service were used to collect patient data. Calculations of clinical sensitivity and specificity were performed considering, respectively, the number of patients with MRD+ and those with undetectable MRD (uMRD) who relapsed or not after the MRD results.

Results: 4/7 patients with pre-HSCT MRD≥0.1% had relapses in the first post-HSCT MRD evaluation, from D+34 to D+209 post-HSCT. Eight patients with MRD ≤ 0.07% (0.002 – 0.07%) had no post-HSCT relapse at a median follow-up of 9 months. Therefore, MRD<0.1% had no impact on post-transplant relapse in this series. One out of 34 patients with pre-HSCT uMRD (limit of detection LOD=10-5) relapsed on D+88 post-HSCT. Thirty seven out of 38 patients with post-HSCT uMRD (LOD = 10-5) did not relapse during a median of 12 months of follow-up. One patient with post-HSCT uMRD relapsed 3 months after the MRD evaluation. Although sensitivity calculation was hampered by the low number of patients with clinically significant levels of MRD+ (>0.1%), 57% of these patients had relapse after HSCT. However, the clinical specificity of the protocol was 97%. Discussion: these are preliminary results from the clinical validation of the 10-color MFC protocol for AML MRD detection. Despite the small cohort and the short follow-up time, the MFC protocol for AML MRD showed efficacy for clinical use. In this study, objective parameters needed to be used to calculate the clinical sensitivity and specificity of the MRD tests. However, it should be considered that relapses in AML depend on the variability of the biological behavior of the disease, the kinetics of the MRD and the therapeutic intervention.

Key words: Acute Myeloid Leukemia, Measurable residual disease, Flow cytometry MRD

COMPARISON BETWEEN POST-TRANSPLANT CYCLOPHOSPHAMIDE USE AND CONVENTIONAL PROPHYLAXIS OF GRAFT-VERSUS-HOST DISEASE: A RETROSPECTIVE STUDY

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Introduction: In order to modify the immune response balance between donor and recipient in the context of haploidentical transplantation, the use of post-transplant cyclophosphamide (PTCy), which reduces the population of recipient alloreactive T cells, has become the preferred strategy for graft-versus-host disease (GVHD) prophylaxis. Recently, this approach has also been tested and validated in HLA-matched related or unrelated transplants, as well as in unrelated transplants with HLA mismatch. However, high doses of PTCy can cause cardiac toxicity, hemorrhagic cystitis, and potentially increase the incidence of viral infections. Therefore, comparative studies are needed to evaluate the outcomes of PTCy use compared to other conventional GVHD prophylaxis strategies.

Objective: To evaluate the outcomes of patients undergoing allogeneic peripheral blood stem cell transplantation (PBSCT) and to compare the use of post-transplant cyclophosphamide with other GVHD prophylaxis strategies.

Patients and Methods: Retrospective analysis of consecutive patients transplanted between March 2014 and March 2023 at two transplant centers. The median follow-up was 24 months (range: 3-116 months).

Results: A total of 118 adult patients undergoing PBSCT were included. There were 70 HLA-matched related donors, 28 HLA-matched unrelated donors, and 20 unrelated donors with one HLA mismatch. The median age was 52 years (range: 18 to 80), with a majority being male (51%). The most common diagnoses were acute myeloid leukemia (37%), acute lymphoblastic leukemia (18%), and myelodysplastic syndrome (18%). The disease risk index (DRI) was considered low or intermediate in 53% of cases, high in 31%, and very high in 16%. The majority of patients (76%) had a low risk of transplant-related complications (HCT-CI). Most patients received reduced-intensity conditioning regimens (78%), and the majority (72%) received some sort of T-cell depletion, with 36 (31%) patients receiving PTCy and 49 (41%) receiving ATG.

No significant differences were found between the groups (PTCy vs. non-PTCy) in overall survival at 24 months (65% vs. 61%, p = 0.71, respectively), disease-free survival at 24 months (55% vs. 53%, p = 0.76), non-relapse mortality at 24 months (21% vs. 23%, p = 0.84), relapse rate at 24 months (24% vs. 24%, p = 0.61), neutrophil engraftment at 30 days (89% vs. 93%, p = 0.49), and incidence of grade II-IV acute GVHD at 100 days (31% vs. 29%, p = 0.99), grade III-IV acute GVHD at 100 daus (6% vs. 12%, p = 0.22), chronic GVHD at 24 months (42% vs. 50%, p = 0.51), and moderate/severe chronic GVHD at 24 months (19% vs. 23%, p = 0.66). There was also no difference in the incidence of infections, including viral infections and cytomegalovirus reactivation.

Conclusions: The use of PTCy demonstrated similar clinical outcomes to other GVHD prophylaxis strategies, without an increased risk of infections or mortality. Therefore, PTCy can be considered a viable, safe, and cost-effective option for GVHD prophylaxis in the context of HLA-matched and HLA-mismatched transplants.

Keywords: Bone marrow transplantation, graft-versus-host disease, post-transplant cyclophosphamide.

FIGURE 1 – **Overall survival**

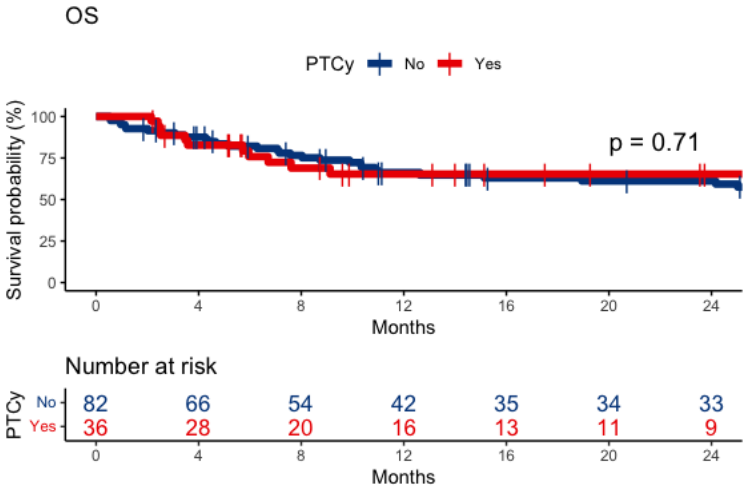
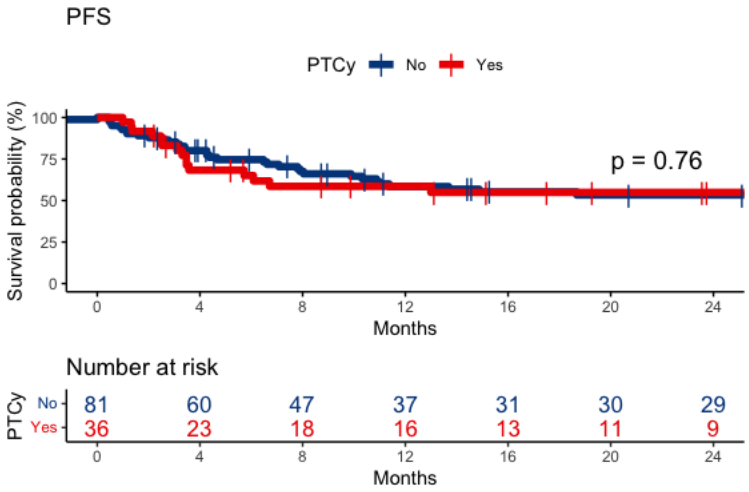


FIGURE 2 – **Progression-free survival**



EVALUATION OF THE IMPACT OF THE DISEASE RISK INDEX SCORE AND MINOR RESIDUAL DISEASE BY FLOW CYTOMETRY AS PROGNOSTIC FACTORS IN ALLOGENOUS BONE MARROW PRE-TRANSPLANTATION IN PATIENTS WITH ACUTE MYELOID LEUKEMIA

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Introduction: Allogeneic hematopoietic stem cell transplantation (HSCT) is the therapy with the best curative potential for patients with intermediate/high-risk acute myeloid leukemia (AML). Although many factors influence the outcome of allogeneic HSCT, disease type and disease state at the time of transplant are two of the strongest determinants of post-transplant survival[2]. In this context, the Disease Risk Index (DRI) was developed and validated in a cohort of more than 13,000 patients, which stratified patients into 4 groups with different overall survival (OS)[2]. Minimal residual disease (MRD) is an important biomarker that is consolidated for the prognosis, monitoring and evaluation of the effectiveness of the treatment performed[3].

Objective: Evaluate the results of the pre-transplant DRI and MRD in patients with AML and to correlate the outcomes of patients treated with allogeneic HSCT for AML in a private institution in Brazil from January 2017 to May 2023.

Methods: This is a retrospective, unicentric and descriptive study. MRD was evaluated immediately pre-transplantation through flow cytometry and was considered positive when ≥0.1%. DRI was grouped into two groups: low/intermediate risk and high/very high risk. Statistical analyzes were performed using the Cox regression model.

Results: A total of 57 patients were evaluated, 34 of whom had negative MRD and 23 positive, the mean age between the groups was 55 and 60 years, as well as HCT-CI between 0-2 in 91% of the patients in the negative MRD group and 78% of the MRD positive group. Regarding the HSCT subtype, approximately 70% of patients in both groups were performed with alternative donors (unrelated and haploidentical), with a reduced-intensity conditioning regimen (RIC) and apheresis cell source of peripheral blood. The median follow-up time was 18 months. In the univariate analysis, DRI was shown to have an impact on overall survival (OS), while in the multivariate analysis this impact was not maintained. With regard to DRM, when positive, it is shown as a risk factor with HR 5.48 (1.98-15.16) and p 0.001. The impact of MRD, age and bone marrow source are prognostic factors even when controlled for age, cell source and type of transplant.

Conclusion: Our results show that both DRI and pre-transplant MRD have a prognostic impact. Apparently, MRD is more important than DRI for survival prognosis.

Keywords: Disease Risk Index (DRI), Minimal residual disease (MRD), Acute Myeloid Leukemia (AML)

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FIGURE 1. Overall survival analysis. In patients with negative MRD it was 90% (79-100%), while in patients who had positive MRD it was 53% (36-80%).

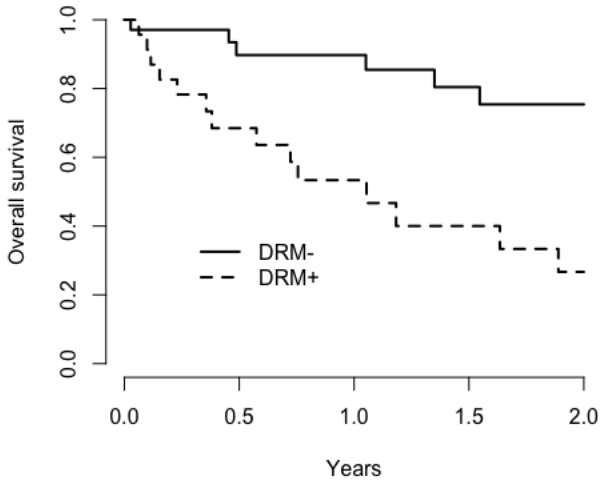
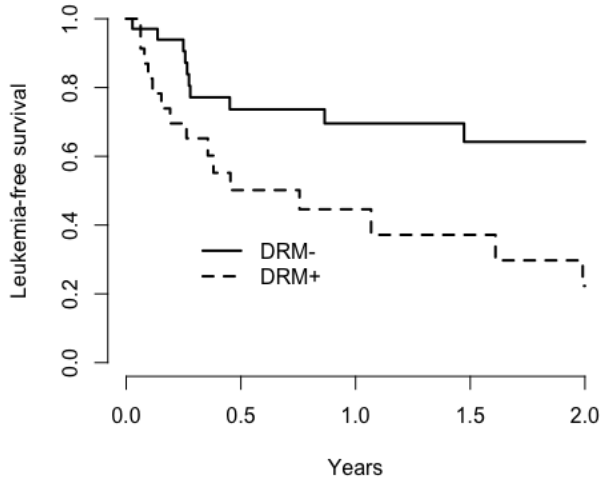


FIGURE 2. Analysis of leukemia-free survival. In patients with negative MRD it was 70% (55-89%), while in patients who had positive MRD it was 45% (28-72%).



HAPLOIDENTICAL HEMATOPOIETIC CELL TRANSPLANTATION WITH POSTTRANSPLANT CYCLOPHOSPHAMIDE, A CALCINEURIN INHIBITOR, AND MYCOPHENOLATE MOFETIL 30 MG/KG: A SINGLE CENTER STUDY AND A COMPARISON WITH A CONCURRENT COHORT OF UNRELATED DONOR TRANSPLANTATION

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Introduction: Haploidentical BMT has been a reality since the 80s, but it was after the publication of Ephraim Fucks et al. with the "in-vivo" lymphodepletion with posttransplant cyclophosphamide that the procedure was widely adopted. The original regimen is based on reduced-intensity conditioning and graft-versus-host disease prophylaxis with cyclophosphamide 50mg/kg on D+3 and D+4, tacrolimus + mycophenolate mofetil at a dose of 45mg/kg.

Justification: Due to the high seroprevalence of cytomegalovirus in Brazil, the first haploidentical transplants performed at the Bone Marrow Transplant Center of Instituto Nacional do Cancer were accompanied by 50% CMV disease and, from then on, we reduced mycophenolate to a dose of 30mg/kg, like Genova protocol.

Method: A retrospective study of patients who underwent unrelated and haploidentical bone marrow transplantation between July 2016 and December 2022. All haploidentical patients received PTCy-based GVHD prophylaxis (50 mg/kg D+3 and D +4) with a calcineurin inhibitor and MMF 30 mg/kg starting at D+5. All URD patients received ATG-based GVHD prophylaxis (6 mg/kg, proximal to the transplant) with a calcineurin inhibitor and a short-course methotrexate. Studied outcomes were overall and disease-free survival, relapse, non-relapse mortality, grades II-IV and III-IV acute GVHD, chronic GVHD, moderate/severe GVHD, and CMV reactivation. All analyzes were carried out with R, R Foundation for Statistical Computing, Vienna, Austria, version 4.2.1.

Results and Discussion: With a median follow-up of 2.1 years, 119 patients were analyzed, 46 of them submitted to haploidentical transplantation, and 73 of them to unrelated transplantation. The median age was 25 years in the unrelated transplant group and 21 years in the haploidentical transplant group. Graft failure occurred in 3/46 of patients submitted to haploidentical and 2/73 of patients submitted to unrelated. No significant difference was observed in overall 2-year survival (67% in unrelated and 50% in haploidentical p=0.20). Disease-free survival was not different either (63% in unrelated vs 49% in haploidentical p=0.20). The rate of acute and chronic graft-versus-host disease was also not different, as well as the rate of relapse and non-relapse mortality. These results are similar to the literature and were not different from studies that used MMF at a dose of 45mg/kg.

Conclusion: In our study, the results of PTCy-based haploidentical transplantation with 30 mg/kg of MMF were similar to the ones of a concurrent cohort of ATG-based, unrelated donor transplantation. No outcome was different. Main limitations of our study are its retrospective nature and the relatively small sample size that hampers finding small differences. Nonetheless, we have shown that PTCy-based haploidentical transplantation with 30 mg/kg of MMF is able to achieves excellent results. Prospective comparisons of mycophenolate at a dose of 45mg/kg and 30mg/kg are needed.

TABLE 1. Population characteristics

	URD	Haplo	P value
Total	73	46	
Age			0.889
median(IQR)	25.1 (10.5,44.6)	21.4 (13.4,40.5)	
Sex			0.379
M	45 (61.6)	32 (69.6)	
F	28 (38.4)	14 (30.4)	
Diagnosis			0.013
Hodgkin L	0 (0)	5 (10.9)	
ALL	35 (47.9)	20 (43.5)	
AML	20 (27.4)	11 (23.9)	
CML	9 (12.3)	2 (4.3)	
JMML	1 (1.4)	0 (0)	
NHL	1 (1.4)	5 (10.9)	
PMF	1 (1.4)	0 (0)	
MDS	6 (8.2)	3 (6.5)	
DRI			0.505
1	8 (11)	2 (4.3)	
2	37 (50.7)	29 (63)	
3	22 (30.1)	12 (26.1)	
4	6 (8.2)	3 (6.5)	
Sex of donor			0.721
M	53 (72.6)	32 (69.6)	
F	20 (27.4)	14 (30.4)	
Source			0.082
BM	54 (74)	27 (58.7)	
PBSC	19 (26)	19 (41.3)	
Regiment			< 0.001
MAC	71 (97.3)	33 (71.7)	
RIC	2 (2.7)	13 (28.3)	

TABLE 2. Outcomes.

Outcome (at 2y)	URD (n = 73)	Haplo (n = 46)	p-value
Overall survival	67%	50%	0.20
Relapse-free survival	63%	49%	0.20
Relapse	16%	21%	0.65
Non-relapse mortality	20%	31%	0.32
aGVHD II-IV	45%	37%	0.53
aGVHD III-IV	11%	7%	0.71
cGVHD	37%	34%	0.93
cGVHD, mod./severe	18%	21%	0.83

HAPLOIDENTICAL HEMATOPOIETIC STEM CELL TRANSPLANTATION OF MYELODYSPLASTIC SYNDROME PATIENTS FROM THE LATIN AMERICAN REGISTRY

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Background: Haploidentical Hematopoietic Stem Cell Transplantation is an alternative in the absence of an HLA-matched donors. The aim of this study is to analyze the characteristics and survival time of patients undergoing Hematopoietic Stem Cell Transplantation (HSCT).

Methods: Data from 400 patients were collected patients, during July 2016 to May 2023 from the transplant registry of 32 centers in Latin America available at: tmo.med.br website. Statistics were performed using SPSSv.23.1, considering a significant $p<0.05$.

Results: mean age was 45,54 years. Most patients were ≤ 50 years (50,50 %), about 27,25 % were between 50 and 61 and 22,25 % were > 60 years. There was a predominance of males (58 %). Regarding to the Prognosis Scoring System (IPSS-R), patients were classified as: Very low risk (n=2; 0,50 %), Low risk (n=38; 9,50 %), Intermediate (n=88; 22%), high

risk (n=72; 18%) and very high risk (n=24; 6% %). 176 (44%) patients had no data about R-IPSS stratification. Myeloablative conditioning (MAC) was performed in 287 patients (71,75%). In 65,50% (n=266) of cases, a prior treatment was performed. From these patients, 58,65% used chemotherapy, 31,20% hypomethylating and 10,15% used both. Complications post-HSCT were observed in 314 patients (78,5%) and the most frequent was Infections (n= 253; 80,57%), followed by acute graft versus host disease (GVHD) (n=145; 46,18%) and chronic GVHD (n=113; 35,99%). The frequency of death was 39,5% (n=158). Haploidentical donor (HID) accounted for 12,25% of the HSCT. The predominant donor type was related (MRD) (65%) followed by non-related (MUD) (22,75%).

The association of variables according to type of donor showed that as for the median age of the patients, MUD and HID HSCT patients were younger than the MSD. There was a predominance of MRD donors (16.5%) and MUD (25.4%) in Low Risk patients, while in the intermediate group MUD donors predominate (47.2%). At high risk and very high risk, MSD and (HID) predominate. As for previous treatment or not, it was more used in MUD (81.3%) and HID (85.1%) donors, when compared with MSD (59.1%). From those who underwent treatment, there was a predominance of chemotherapy in MSD and MUD compared to HID, while treatment with hypomethylating agents was more frequent in patients with HID. Reduced Intensity/ non myeloablative conditioning was more frequent in the HID (57.14%), while the Myeloablative was more frequent in the MSD and MUD. Results for acute GVHD were similar but chronic GVHD was less frequent in HID (23.6%) and MSD (42.36%). CMV reactivation was more frequent for HID (55.26%) compared to the other groups. The 5-years was similar for different type of donors.

Conclusion: In general, the study demonstrated similar outcomes after allo-SCT with (HID). Even with a higher frequency of MCV reactivation, Haploidentical HSCT did not influenced death and overall survival for MDS patients being a suitable alternative for HSCT.

Keywords: Hematopoietic Stem Cell Transplantation. Outcomes. Haploidentical Donor

TABLE 1 – Association of transplant characteristics and type of donor (N = 400).

Variables	MSD	MUD	HID	p value
Recipient age (years), median (range)	52 (17,25)	35 (37,5)	41 (43)	<0,001c
Recipient age at TMO (years), median (range)	46 (21)	31 (37,5)	40 (44)	<0,001c
Recipient gender				
Female	114/260 (43,85%)	39/91 (42,86%)	15/49 (30,61%)	0,223a
Male	146/260 (56,15%)	52/91 (57,14%)	34/49 (69,39%)	
Recipient Race				
Black	214/237 (90,3%)	76/86 (88,37%)	40/46 (86,96%)	0,653b
White	23/237 (9,7%)	10/86 (11,63%)	6/46 (13,04%)	
R-IPSS				
Low	24/145 (16,55%)	14/55 (25,45%)	2/24 (8,33%)	0,022b
Intermediate-1	28/145 (19,31%)	12/55 (21,82%)	1/24 (4,17%)	
Intermediate-2	27/145 (18,62%)	14/55 (25,45%)	6/24 (25%)	
High	53/145 (36,55%)	11/55 (20%)	8/24 (33,33%)	
Very high	13/145 (8,97%)	4/55 (7,27%)	7/24 (29,17%)	
Transfused red blood cells				
0	101/257 (39,3%)	34/91 (37,36%)	20/49 (40,82%)	0,208a
less 20 units	74/257 (28,79%)	17/91 (18,68%)	14/49 (28,57%)	
more 20 units	82/257 (31,91%)	40/91 (43,96%)	15/49 (30,61%)	
Transfused platelets				
0	116/257 (45,14%)	38/91 (41,76%)	22/49 (44,9%)	0,094a
less 15 units	54/257 (21,01%)	11/91 (12,09%)	13/49 (26,53%)	

more 15 units	87/257 (33,85%)	42/91 (46,15%)	14/49 (28,57%)	
Previous treatment				
No	105/257 (40,86%)	17/91 (18,68%)	7/47 (14,89%)	<0,001a
Yes	152/257 (59,14%)	74/91 (81,32%)	40/47 (85,11%)	
Type previous treatment				
Chemotherapy	112/152 (73,68%)	37/74 (50%)	7/40 (17,5%)	<0,001b
Hippotherapy	28/152 (18,42%)	29/74 (39,19%)	26/40 (65%)	
Chemotherapy and hippotherapy	12/152 (7,89%)	8/74 (10,81%)	7/40 (17,5%)	
Conditioning type				
Reduced intensity	51/260 (19,62%)	14/91 (15,38%)	25/49 (51,02%)	<0,001b
Myeloablative	192/260 (73,85%)	74/91 (81,32%)	21/49 (42,86%)	
Not myeloablative	17/260 (6,54%)	3/91 (3,3%)	3/49 (6,12%)	
Stem cell source				
Bone marrow	132/260 (50,77%)	48/85 (56,47%)	26/49 (53,06%)	0,654a
Peripheral blood	128/260 (49,23%)	37/85 (43,53%)	23/49 (46,94%)	

TABLE 2. Association of post transplant characteristics and type of donor (N = 400).

Variables	MSD	MUD	HID	p value
Post transplant complications				
Yes	203/260 (78,08%)	73/91 (80,22%)	38/49 (77,55%)	0,899a
No	57/260 (21,92%)	18/91 (19,78%)	11/49 (22,45%)	
Rejection				
Yes	10/203 (4,93%)	5/73 (6,85%)	1/38 (2,63%)	0,736b
No	193/203 (95,07%)	68/73 (93,15%)	37/38 (97,37%)	
VOD				
Yes	16/203 (7,88%)	8/73 (10,96%)	6/38 (15,79%)	0,237b
No	187/203 (92,12%)	65/73 (89,04%)	32/38 (84,21%)	
Chronic GvHD				
Yes	86/203 (42,36%)	18/73 (24,66%)	9/38 (23,68%)	0,006a
No	117/203 (57,64%)	55/73 (75,34%)	29/38 (76,32%)	
Acute GvHD				
Yes	95/203 (46,8%)	33/73 (45,21%)	17/38 (44,74%)	0,956a
No	108/203 (53,2%)	40/73 (54,79%)	21/38 (55,26%)	
CMV				
Yes	85/203 (41,87%)	22/73 (30,14%)	21/38 (55,26%)	0,033a
No	118/203 (58,13%)	51/73 (69,86%)	17/38 (44,74%)	
Infection				
Yes	169/203 (83,25%)	55/73 (75,34%)	29/38 (76,32%)	0,266a
No	34/203 (16,75%)	18/73 (24,66%)	9/38 (23,68%)	
Survival status				
Dead	109/260 (41,92%)	33/91 (36,26%)	16/49 (32,65%)	0,368a
Alive	151/260 (58,08%)	58/91 (63,74%)	33/49 (67,35%)	

REDOME 30 YEARS – THE EVOLUTION OF SEARCH AND UNRELATED TRANSPLANT PROCESS IN BRAZIL

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Introduction: Created in 1993 to meet the needs of Brazilian patients who did not have a compatible donor for hematopoietic stem cell transplantation, the Brazilian Registry of Volunteer Bone Marrow Donors (REDOME) is also responsible for selecting and identifying donors compatible for these patients. Over these three decades, this process has been updated with the incorporation of technological resources that have expanded patient access, the revision of compatibility criteria and the inclusion of international donors.

Objective: To evaluate the profile of registered and transplanted patients since the beginning of REDOME activities, choosing the years 2000, 2011 and 2022 as time frames.

Results: In 1993, REDOME registered only 13 patients, the vast majority linked to HC-USP, which is justified by the initial location of the Registry in São Paulo. Until 1999, this number increased irregularly, totaling 337 patients. As of 2000, already under the coordination of INCA/MS, this activity was structured and the number of patients increased from 278 (2000) to 1636 (2022), with a prevalence of pediatric patients from the Southeast (53%) and South (18 %) regions, and an increasing share of elderly patients, as shown below:

	2000	2011	2022
Registered patients	278	1118	1636
Age (mean)	22	24	30
Elderly patients - > 65 y/o (%)	0	1	6
Aplastic Anaemia (%)	15,5	15,5	14
ALL / ALM (%)	34,9	62	63
CML / Myeloproliferative disorders (%)	34,9	7	5,2
MDS (%)	3,2	5,4	7,5
NHL / Hodgkin disease (%)	3,2	4	2
Immunodeficiency / Metabolic disorders (%)	2,1	2,5	4,2
Others conditions (%)	6,1	3,5	4

Considering the transplants that occurred in this period, the first transplant with an unrelated donor at REDOME took place in 1995, but this activity was limited in the first years. In 2000, only 7 Brazilian patients underwent transplantation with an unrelated donor and only one of them used a national donor. Between 2001 and 2010, there were 932 transplants from an unrelated donor, with a progressive increase in the participation of REDOME donors and national umbilical cord units, so that, from 2007, they started to represent the main source. Data from 2011 and 2022 demonstrate the consolidation of this activity with a reduction in the time required to identify a compatible donor and a significantly longer time to perform the transplant:

	2011	2022
Transplanted patients	199	359
National donor (%)	65	61
International donor (%)	35	39
Time to identify matched donor (med - days)	280	78
Time from registration to transplant (med - days)	381	229

Conclusion: The observed results highlight the consolidation of REDOME in the national and international scenario with the significant improvement of its results, but also indicate the challenges related to patient access to transplantation, once the donors have been identified.

RESULTS OF ALLOGENIC HEMATOPOIETIC STEM CELL TRANSPLANTATION IN PATIENTS WITH RELAPSED/REFRACTORY CLASSICAL HODGKIN LYMPHOMA IN A BRAZILIAN TRANSPLANT CENTER

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Introduction: In Brazil, 3080 new cases of classical Hodgkin lymphomas (cHL) are expected between 2023 to 2025. Of these, up to 80% will be cured with first line treatment. However, for relapsed / refractory (R/R) patients, the scenario of curative therapeutic possibilities is restricted. Allogeneic stem cell transplantation (alloSCT) is one of the currently curative treatment modality in the setting of R/R patients. The data of Brazilian patients submitted to alloSCT are poorly known.

Objective: To describe the demographic and clinical characteristics of patients submitted to alloSCT as well as their progression free survival (PFS) and overall survival (OS) in a Brazilian transplant center.

Methods: The study is characterized by observational, retrospective and descriptive design. Medical record data of patients with R/R HL submitted to alloSCT between January 2020 and May 2023 at a Brazilian transplant center were analyzed to obtain demographic analysis of the sample as well as for estimates PFS and OS by using Kplan-Meier function.

Results: 15 patients underwent alloSCT with a median age of 29 years and 53,3% were male. All patients received reduced intensity conditioning (RIC). In 60% of the cases, the donor was haploidentical and in 40% a related donor was used. The median number of prior lines of treatment was 6. 86.7% of patients had previously undergone autologous stem cell transplantation (ASCT). The progression-free survival and overall survival in 12 months were 45,7% and 64,6%, respectively. The incidence rate of acute and chronic graft-versus-host disease (GVHD) was 26,7% and 20,0%, respectively. Conclusion: We can conclude that patients with R/R LH treated with alloSCT in a Brazilian transplant center share clinical features, PFS and OS similar to those already described by other authors. Collaborative studies among centers in our country are needed in an effort to better treat this patient population.

Keywords: relapsed, refractory Hodgkin's lymphoma; allogeneic stem cell transplantation; reduced intensity conditioning.

THE ROLE OF RED BLOOD CELLS AND PLATELETS TRANSFUSIONS ON HEMATOPOIETIC STEM CELL TRANSPLANTATION OF MYELODYSPLASTIC SYNDROME PATIENTS

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Background: Patients with Myelodysplastic Syndrome (MDS), even using erythropoietin, chemotherapy, hypomethylating agents or Venetoclax, often require transfusion of concentrated red blood cells and platelets. It is known that these procedures can interfere with the prognosis, mainly due to the risk of alloimmunization. This fact becomes more prevalent in patients eligible for hematopoietic stem cell transplantation (HSCT), the only truly curative option. HSCT is not always possible, due to comorbidities or even general clinical conditions. The impact of transfusions on the outcomes of HSCT is supposed to be relevant. Therefore, we decided to study the role of transfusions in our MDS transplanted patients.

Methods: We analyzed data of 402 MDS patients from 32 centers of the Latin American MDS Transplant Registry since 1989 to 2022. Patients were stratified according to number of red blood and platelets

units transfused (< or > than 20 units/< or > than 15 units, respectively) and data was associated to R-IPSS risk. Statistics were performed using SPSSv.23.1, considering a significant p<0.05.

Results: From 402 patients, 201 could be stratified for R-IPSS risk. Most of patients were classified as high risk (82; 40,79%) and intermediary (82; 40,79%), followed by low/very low risk (37; 18,42%). From the 201 stratified, 66 (32,84%) did not received red blood cells transfusion, 52 (25,87%) received less than 20 units and 83 (41,29%) received more than 20 units. For platelets, 74 (36,82%)did not received transfusion, 41 (20,4%) received less than 15 units and 86 (42,79%) received more than 15 units. The difference was not significant among the groups in both analysis. The 2-years-Overall survival for red blood cells was not significant different among groups (Figure1). For platelets, it was significantly lower for patients who received more than 15 units (p=0,0096) (Figure 2). Regarding red blood cells, the results were similar for the groups.

Conclusion: Transfusions add a risk for HSCT outcomes, especially considering the risk of alloimmunization. In this study, patients classified as high risk showed to be more dependent of blood cells transfusions; however, the overall survival was influenced only by transfusions of platelets in amount of 15 units.

Keywords: Hematopoietic Stem Cell Transplantation. Myelodysplastic Syndrome. Transfusions

FIGURE 1: 2-years- Overall Survival according to number of blood cells transfusions in MDS patients.

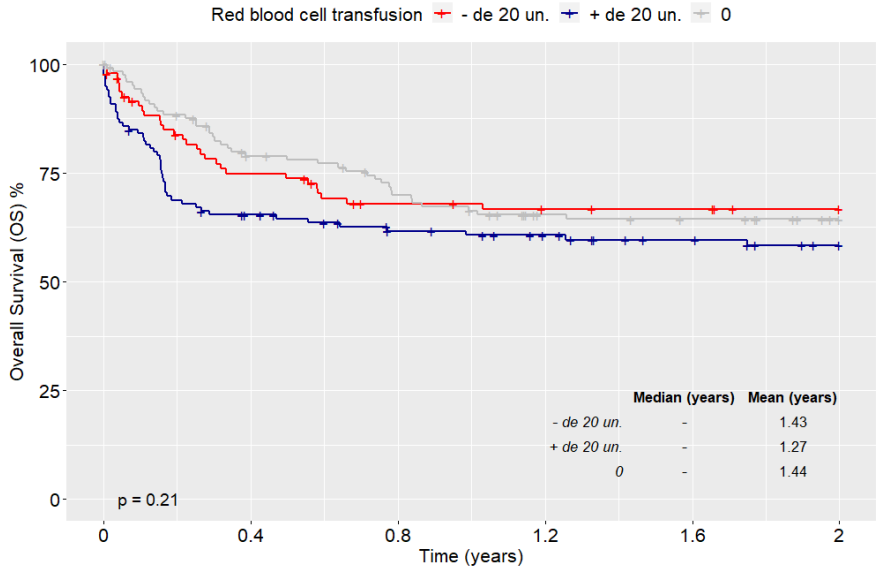
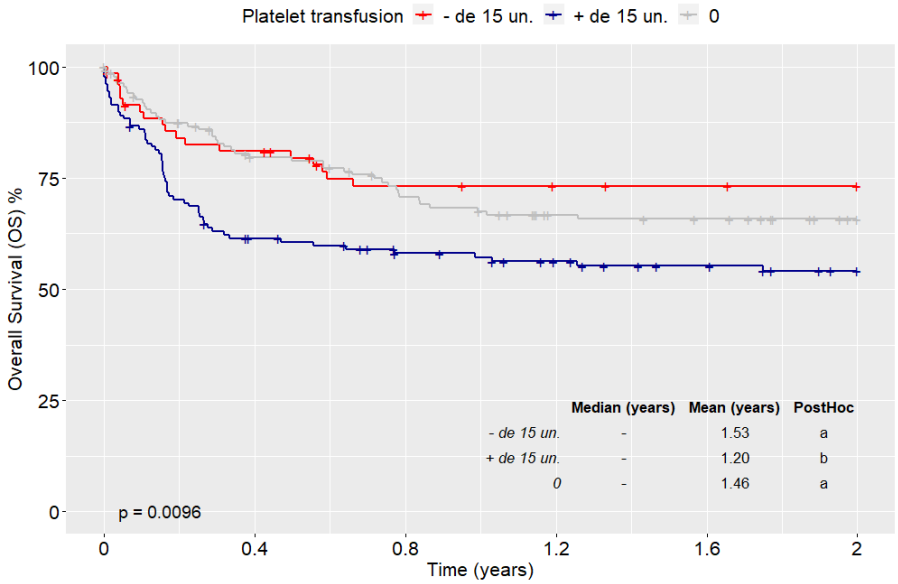


FIGURE 2: 2-years- Overall Survival according to number of platelets transfusions in MDS patients.



AUTOLOGOUS HSCT

CRYOPRESERVATION OF HEMATOPOIETIC STEM CELLS AT - 80°C: HOW LONG IS IT SAFE?

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Introduction: Certain methods of bone marrow transplantation (BMT) require prior cryopreservation of hematopoietic stem cells (HSCs). Proper preservation of these cells proves critical to ensure product quality and, consequently, bone marrow engraftment outcome. Cooling the cells to temperatures below 0 ºC reduces their metabolism but fails to completely stop it, leading to a gradual deterioration of the cells. Evidence demonstrates that storage at -196 °C in liquid nitrogen slows this deterioration process by interrupting intracellular metabolic pathways (1-5). However, storing in liquid nitrogen presents a significant challenge for many transplant programs as they expand and accumulate products, causing a consistent decrease in available space.

Objective: This study aimed to evaluate the cell viability of HSCs maintained at short and long-term storage at -80°C and to analyze the relationship between time of storage and cell viability as well the impact of cell concentration (total nucleated cells – TNCs) in cell viability after thawing. Finally, to analyze the impact of number of CD34+ cells viable on engraftment outcome.

Methods: Twenty-nine aliquots were previously separated at the time of cryopreservation of HSCs from 21 patients with multiple myeloma and 8 patients with lymphoma. The cells were cryopreserved in cryovial with 5% dimethyl sulfoxide, 6% hydroxyethylamide solution and 4% albumin at –80º C freezer. In all samples, the cell concentration was evaluated in XN-350 Sysmex Hematology Analyzer, and the viability of CD34+ cells was evaluated with 7AAD (flow cytometry; ISHAGE protocol; FACS Canto II and FACS Lyric, BD Biosciences). Samples were categorized into three groups, referred as: T0 (before cryopreservation), T1 (HSCs cryopreserved up to 6 months) and T2 (HCSs cryopreserved for 4-6 years).

Results: There was no difference of cell viability of groups T0, T1 and T2 (pre-cryopreservation, until 6 months and 4 to 6 years respectively) (Table 1 and Figure 1). In the paired analysis, when compared T1 and T2 groups, the cell viability was not impacted by storage time ($p<0.05$) (Figure 1). When evaluating, together or separately, the correlations between viability and storage time and cell concentration, there was no significant association (Figure 2). Finally, there was also no association between engraftment time and cell viability, and engraftment time and CD34+cells/Kg, even when adjusted for viability and recovery (Figure 3).

Conclusion: Findings indicate that cryopreservation at -80°C for up to six years does not impact cell viability. This finding holds significance for safely storing cryopreserved cells without compromising their quality when nitrogen storage remains unfeasible. Despite this encouraging result, careful monitoring of the clonogenic assay should follow to also ensure the functional capacity of the HSCs.

Keywords: Hematopoietic Stem Cells. Viability Cell. Cryopreservation.

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TABLE 1. Comparison of number of cryopreserved total nucleated cells (TNCs), recovery after thawing, number of CD34+ cells/mm3 and viability of CD34+ cells in according to cryopreservation time. Mann-Whitney test.

Time of cryopreservation in freezer -80°C	Until Six months (n=29)	Four-Six years (n=19)	p value
Total nucleated cells	370.470 (198.950-512.100)	373.650 (210.820-523.060)	0.81
Recovery after thawing (%)	100 (70-100)	97 (83-100)	0.80
CD34+ cells/Kg (x106)	4.02 (2.10 -17.23)	3.92 (2.13-17.53)	0.93
7-AAD Viability CD34+ cells	98.2 (94.5-100)	98.0 (97.00-99.5)	0.10

FIGURE 1: Comparison of hematopoietic stem cell viability before cryopreservation (T0), until 6 months (T1) and 4 to 6 years of cryopreservation (T2) (Kruskal-Wallis test, p>0.05). Paired test between viability observed in groups T1 (until 6 months of cryopreservation), and T2 (4 to 6 years of cryopreservation) (Wilcoxon test, p<0.05). Correlation between time of storage (cryopreservation) and cell viability (Spearman test: r= -0.1592 and p=0.2798) and correlation between time of storage (cryopreservation) and cell concentration (Spearman test: r= -0.025 and p=0.078).

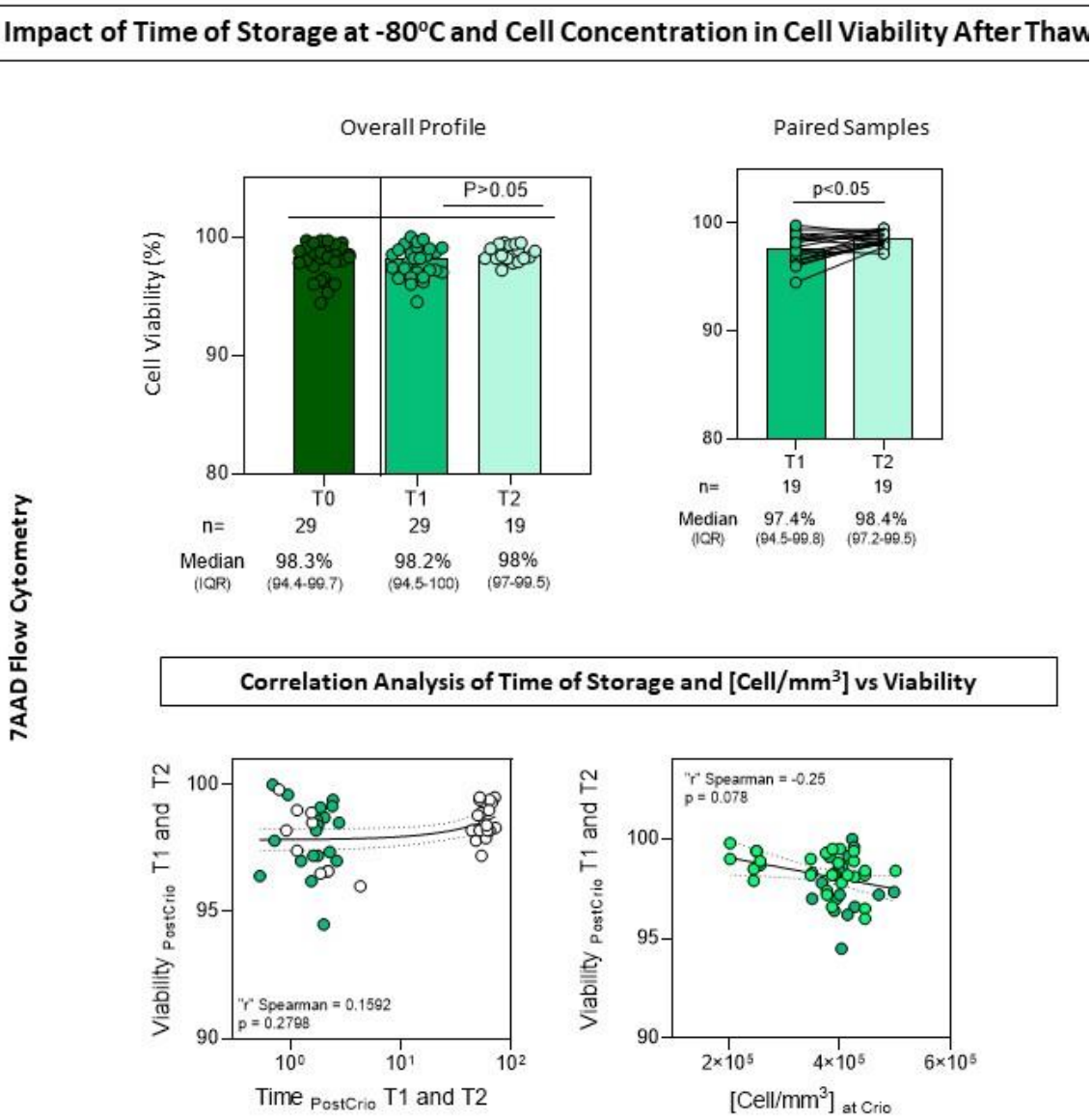


FIGURE 2: Correlation between time of storage (cryopreservation) and cell viability (Spearman test: r= 0.220 and p=0.250) and correlation between time of storage (cryopreservation) and cell concentration (Spearman test: r= 0.307and p=0.108) for T1 group (until six months of cryopreservation). Correlation between time of storage (cryopreservation) and cell viability (Spearman test: r= 0.308 and p=0.199) and correlation between time of storage (cryopreservation) and cell concentration (Spearman test: r= -0.068 and p=0.687) for T2 group (4 to 6 years of cryopreservation).

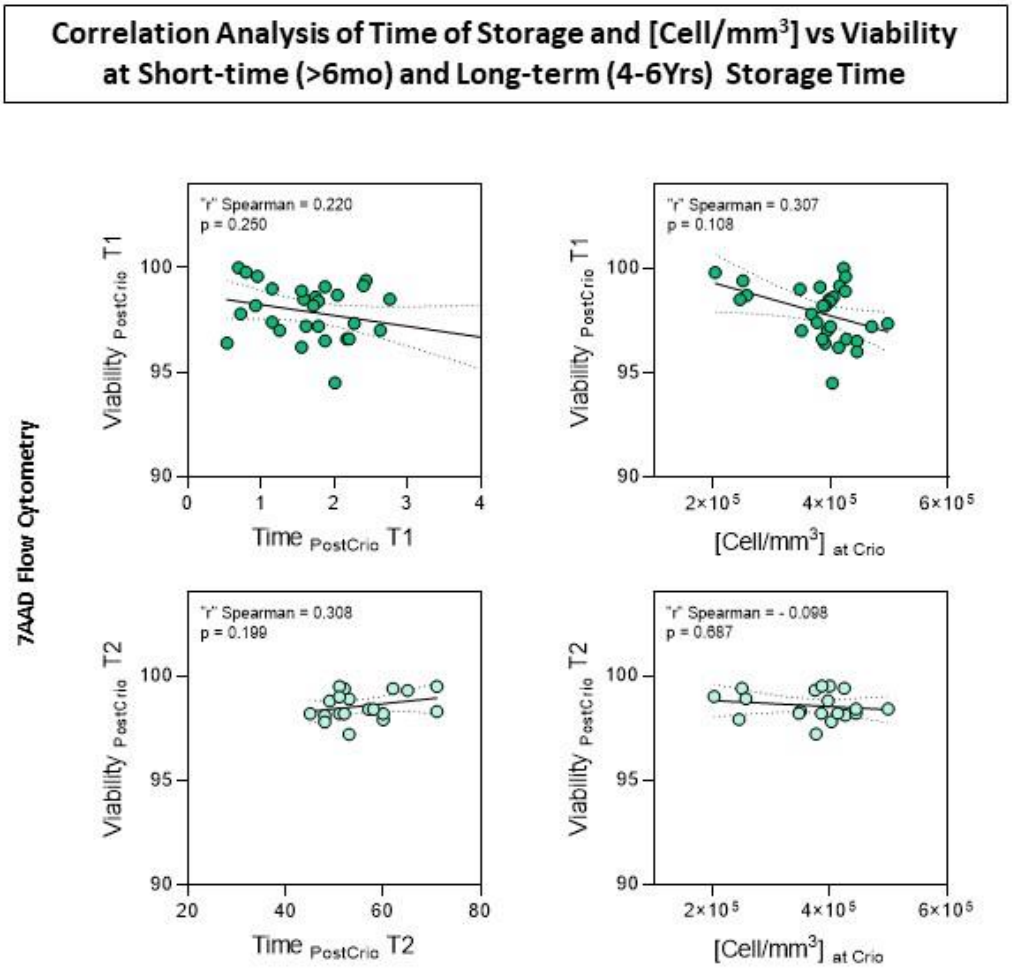
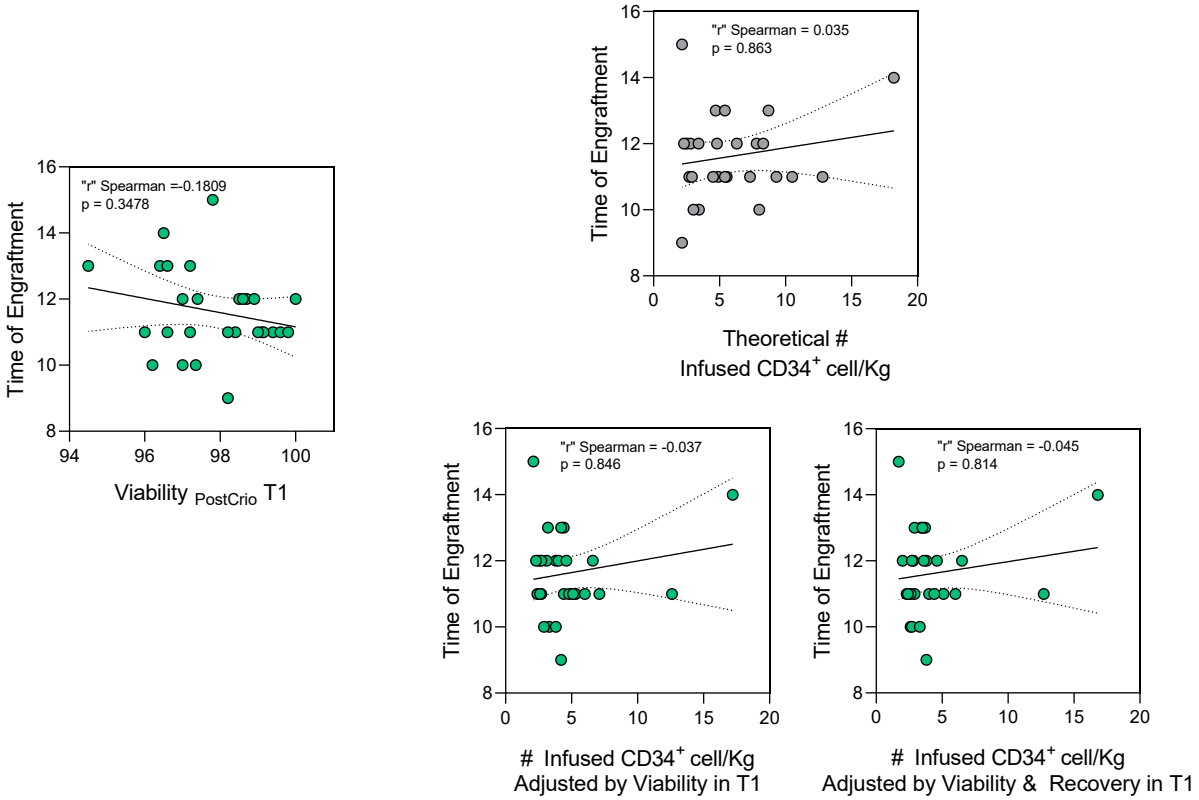


FIGURE 3: Correlation between time of engraftment and cell viability (Spearman test: r= 0.220 and p=0.250) in T1 group. Correlation between time of engraftment and theoretical infused CD34+ cell/Kg (r= 0.035, p=0.863), CD34+ cell/Kg adjusted by viability (r= 0.037, p=0.846), and CD34+ cell/Kg adjusted by viability and recovery (r= 0.045, p=0.814) in T1 group (Spearman test).



EFFICACY AND SAFETY OF VINORELBINE PLUS GRANULOCYTE COLONY-STIMULATING FACTOR FOR HEMATOPOIETIC PROGENITOR CELL MOBILIZATION IN POOR MOBILIZERS PATIENTS

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Introduction: Granulocyte colony-stimulating factor (GCSF), alone or combined with chemotherapy, is commonly used for hematopoietic progenitor cells (HPC) mobilization for autologous stem cell transplantation (ASCT). The chemotherapy regimen most frequently used for chemomobilization is cyclophosphamide with GCSF, but it has disadvantages such as the difficulty to predict the ideal time for leukapheresis and the increased risk of hospitalization for neutropenic fever and other toxicities. Recently, plerixafor with GCSF has been shown as an effective option for HPC mobilization, but it can be prohibitively expensive, limiting its use. A few years ago, the potential of stem cell mobilization with vinorelbine and GCSF was demonstrated in two studies. In view of these considerations, we decided to evaluate the results of HPC mobilization with vinorelbine and GCSF in patients at high risk of mobilization failure in a Brazilian Public Hospital.

Objectives: Evaluate the mobilization efficacy and safety of vinorelbine and GCSF in poor mobilizers pacients.

Methods: Retrospective study, including patients with previous mobilization failure and at high risk of mobilization failure who underwent HPC mobilization for ASCT from January 2021 to January 2023. The mobilization regimen used was vinorelbine (35mg/m2; maximum of 60mg) on day 1 and daily GCSF (10µg/kg/day) from day 4 to leukapheresis. We evaluated the mobilization failure rate and the related adverse events.

Results: We analyzed 18 patients with myeloma (n=7), non-Hodgkin's lymphoma (n=4), Hodgkin lymphoma (n=4), promyelocytic leukemia (n=2) and germ cell tumor (n=1). The median age was 50 years (quartil ranges: 46-60 years). Thirteen patients had previously failed mobilization attempts with GCSF alone. Adverse events, described as mild and transient, were observed in 8 patients and included constipation (36%), phlebitis (18%) and headache (18%). One patient had neutropenic fever requiring antibiotic treatment. Blood transfusions were not required. Stem cell collection was successfully performed in 17 patients (94%) with a median of 4.3 ×106 CD34+ cells/kg (quartil range: 3.0–4.7) in the collect product. One patient undergoin multiple lines of chemotherapy reached a maximum of 2.0 CD34+ cells/µL in peripheral blood and did not proceed to leukapheresis. In 16 patients (89%), the stem cell apheresis was performed on day 8, as planned, and for 16 patients (89%) a sufficient stem cell dose was reached with one apheresis only.

Conclusions: Mobilization with vinorelbine and G-CSF is an interesting alternative of chemomobilization due to its effectiveness, favorable toxicity profile and lower cost. Moreover, the administration of vinorelbine in a single dose and the more accurately timed apheresis compared to other chemomobilization regimens reduce the lengh of hopitalization and simplify the hematopoietic progenitor cells collection procedure.

EVALUATION OF THE EFFICACY OF INCREASED FILGRASTIM DOSE ON MOBILIZATION FOR AUTOLOGOUS HEMATOPOIETIC STEM CELL TRANSPLANTATION (ASHCT)

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Introduction: Mobilization of hematopoietic stem cells (HSCs) is a critical step in Autologous Hematopoietic Stem Cell Transplantation (AHSCT). Patients who fail to achieve an adequate number of CD34-positive (CD34+) cells in peripheral blood (PB) on the 4th day of mobilization using filgrastim alone have a success rate of less than 40% on the 5th day. The use of plerixafor in this situation is a strategy to enhance mobilization performance, but its high cost poses difficulties in accessing

Objectives: Assess whether there is benefit from increasing the dose of figrastim on the 4th day based on the CD34+ cell count in the PB and identify variables that influence the success of dose adjustment and mobilization.

Methods: Patients eligible for AHSCT underwent mobilization with an initial average dose of 10 mcg/kg/day of filgrastim. On the 4th day, CD34+ cell count was performed, and if it was less than 10 cells/μL, the average dose was increased to 20 mcg/kg/day. On the 5th day, a reassessment of CD34+ cell count was conducted, and if it was ≥ 9 cells, collection was initiated. In addition to evaluating the efficacy of this strategy, predictive variables including gender, age group, underlying onco-hematological disease, pre-mobilization blood count, albumin levels, and number of previous therapies were assessed. Statistical analysis involved Wilcoxon test for paired data, given the non-normal distribution of the sample, and datas non-parametrics. And multiple regression modeling. Statistical significance was set at $p < 0.05$.

Results: A total of 103 patients were evaluated, with a median age of 52 years, 56 (54%) were male, and 69 (66%) with Multiple Myeloma (MM). Albumin levels, previous therapies, pre-AHSCT therapeutic response, and previous use of radiotherapy were determinant factors for mobilization success based on generalized regression analysis. Seventy-two (70%) patients did not require dose adjustment, while among the 31 (30%) patients who had their dose adjusted, 21 (67%) had MM, and only in these cases this strategy was effective, resulting in adequate CD34+ cell count for collection in 13 (61%) cases.

Conclusions: The success rate of mobilization with the traditional dose of 10 mcg/kg/day of filgrastim was comparable to the literature. For MM patients, increasing the dose on the 4th day of mobilization based on CD34+ cell count led to a higher success rate compared to other authors who maintained the traditional dose, with 61% of patients achieving an adequate CD34+ cell count compared to 35% to 48% reported in the literature. This strategy was not effective for lymphoma patients, and randomized studies are needed to adequately evaluate its effectiveness in patients with MM.

HORMONAL EVALUATION, BONE MASS AND SARCOPENIA IN PATIENTS AFTER HIGH-DOSE CHEMOTHERAPY FOR AUTOLOGOUS HEMATOPOIETIC STEM CELL TRANSPLANTATION FOR LYMPHOMA

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Introduction: The patients quality of life after autologous hematopoietic stem cell transplantation (aHSCT) is a problem that requires integral care, with frequent endocrine complications. After the first year of follow-up, the risk of bone loss increases and the incidence of fractures triples. Sarcopenia is a pathology recently recognized by the World Health Organization and may occur in up to 70% of patients diagnosed with cancer. It is a risk factor for musculoskeletal complications.

Objective: To identify possible hormonal changes, bone mass and sarcopenia in patients undergoing aHSCT due to lymphoma.

Methods: Patients were evaluated through the medical appointment with body mass index (BMI); abdominal circumference, handgrip (CAMRY) strength test and gait speed test, in addition to laboratory tests for metabolic, hormonal and densitometry investigation (DXA).

Results: Of 179 patients transplanted for lymphoma, 32 (17.8%) agreed to participate in the study. Twenty-one (65.6%) received lomustine, etoposide and cyclophosphamide (LEC), 6 (18.7%) cyclophosphamide, etoposide and carmustine (CBV) and 5 (15.6%) lomustine, cytarabine, etoposide and melphalan (LEAM). Hodgkin's lymphoma was the most prevalent diagnosis (62.5%), as well as females (53%). The average time of clinical evaluation after aHSCT was 50.3 months (median 26.5 months) with a mean age of 34.4 years. Of the 17 women evaluated, 15 (88.2%) were in menacme period, and five of them had been transplanted more than four years ago at the time of the clinical evaluation. The average time of amenorrhea in this group was 45 months. As for primary gonadal failure, excluding 2 patients who were already menopausal before aHSCT, 66.6% had FSH>40 mIU/ml and impaired fertility in men was also evidenced in 66.6% by increased FSH. Regarding the metabolic evaluation, 9% have type 2 diabetes. The BMI>25 was observed in 43.7% of patients, with 50% being overweight identified in the DXA by the body fat index. The diagnosis of Metabolic Syndrome occurred in 28%, with the main associated risk factors being Hypertension and low HDL. From the bone point of view, 22.5% had decreased bone mass and 6.45% had osteoporosis. The diagnosis of Sarcopenia was identified in 9.35% according to the 2019 EWGSOP criteria. All patients with low appendicular lean mass index underwent aHSCT from 2019 onwards with an average time of 11.75 months for completion densitometric evaluation, suggesting this comorbidity more acute.

Conclusions: Corroborating with world literature, the hypothalamic-pituitary-gonadal axis was the most affected, suggesting prior counseling regarding the cryopreservation of ovum and spermatozoa. Sarcopenia is more prevalent after allogeneic transplantation, however it also deserves attention in this population. The incidence of osteoporosis found was small, probably due to the longer mean follow-up time.

HSCT PEDIATRIC

ALLOGENEIC BONE MARROW TRANSPLANTATION (BMT) FROM HLA-IDENTICAL OR HAPLOIDENTICAL (HAPLO) DONORS FOR CHILDREN AND ADOLESCENTS WITH SICKLE CELL DISEASE (SCD): A FEASIBLE CURATIVE OPTION

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Introduction: BMT is the only curative option available for SCD. Since few patients have a healthy HLA-identical donor (MSD), haplo donors have expanded the donor pool to approximately 90% of the patients. The addition of thiotepa to the Johns Hopkins backbone showed durable engraftment and excellent overall survival. Based on these results, the international multi-institutional cooperation was developed as a non-funded guideline - Vanderbilt Haplo Learning Collaborative (VGC2) and modifications have been made according to the international results obtained throughout the study using identified data.

Methods: Retrospective data of all 26 patients with SCD followed by our group after MSD (n=7) and haplo (n=19) BMT performed in four different institutions. With a MSD conditioning was rATG 4.5mg/kg, Bu (AUC 4,500), Flu (120mg/m^2) or rATG-Bu- Cy (200mg/kg) and with haplo donors, rATG 4.5mg/kg, Thiotepa 10mg/kg, Flu 150mg/m^2, Cy 29 mg/kg and TBI 2Gy. Patients were prepared to BMT with intense hypertransfusion/bleeding or erythracytapheresis to keep HbS<30 and Hb~10, reticulocytes <10% for 2-3 months prior to BMT with intensive chelation to keep ferritin <1,000. Due to a high chance of secondary graft failure in pediatric patients in the VGC2 (two of them our patients), the doses of the conditioning therapy were increased (Cy 50 mg/kg and TBI 4Gy in a single fraction) and 6 consecutive patients followed this augmented protocol. The GVHD prophylaxis included CsA-Mtx in MSD and PT-Cy-Mesna, MMF, Sirolimus. Primary graft failure was defined as < 5% donor cells at D+28 and secondary, the loss of previously documented presence of >5% donor cells. All patients had serial STR.

Results: Between Sep/16 and Apr/23, 26 patients with a median age of 11 years (4-20), half females, had BMT, 7 with a MSD and 19 an haplo - 4 siblings, 6 father, and 9 mother: 77% of the donors had sickle cell trait. The graft was bone marrow in all but one patient with SΒthal and Hodgkin's lymphoma. The median follow-up was 15,5 months. All patients en-

grafted; secondary graft failure occurred very suddenly and only after haplo in 2 patients (8%) with a CD34 cell dose of 2 and 8x106CD34/kg, both male teenagers; 2 additional patients had a significant drop in chimerism up to 30% donor cells but responded to serial 1-5 x10(6) CD3/kg DLI (2 and 6) with no immunosuppression, and very mild skin GVHD. All other patients maintain > 89-100% donor cells. All 6 patients with the augmented conditioning regimen have 100% donor chimerism. Acute II-III GVHD was observed in 34% and chronic GVHD in 15%. All patients had viral reactivations: CMV, HHV6, BKV, HHV7 and EBV. Overall survival is 100% and event-free survival 83% at 1 year (Figure 1, 2).

Conclusions: Allogeneic BMT with HLA-identical or haploidentical family donors proved to be a feasible in SCD with 100% overall survival. With a larger cohort and longer follow up we will be able to evaluate the long-term effects of this strategy.

FIGURE 1. Overall Survival

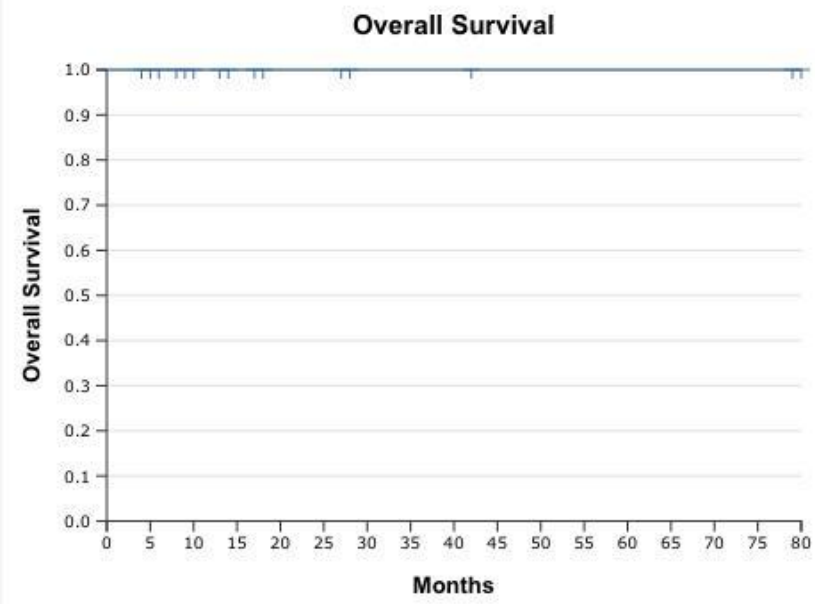
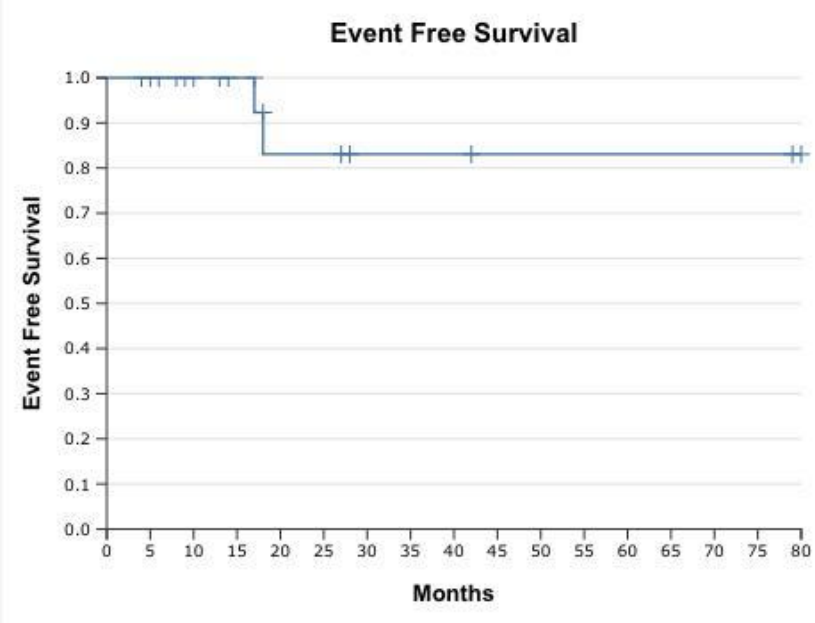


FIGURE 2. Event Free Survival



ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTS (HSCT) WITH ADAPTED FLAMSA CAN CURE HALF OF THE PEDIATRIC PATIENTS WITH REFRACTORY ACUTE MYELOGENOUS LEUKEMIA (AML)

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Introduction: AML represents 20% of the pediatric acute leukemias and 40% of the patients succumb to refractory disease, relapse, or treatment-related toxicities. Patients with refractory disease have the worst outcomes and are usually referred to exclusive palliative care. HSCT in patients with active AML is controversial, but the FLAMSA regimen, a sequential cytoreduction followed by allogeneic HSCT, initially developed to treat adult patients, has been used by the BFM group with very promising results. This strategy was suggested by the Brazilian GELMAI group, but results are still unknown.

Objective: To evaluate the outcome of allogeneic HSCT in patients with refractory AML.

Method: Retrospective study of all pediatric patients undergoing HSCT for the treatment of refractory AML in a single center. Refractoriness was considered the presence of more than 5% blasts on morphology, confirmed by flow cytometry in the majority of patients. Three conditioning regimens were used: Busulfan, Fludarabine and Melphalan (Bu-Flu-Mel; Jaiswal et al.), total body irradiation (TBI) and fludarabine (Solomon et al.), and adapted FLAMSA - Fludarabine, Etoposide and Cytarabine followed by Busulfan (Bu)-based conditioning, associated to Fludarabine (Flu) or Cyclophosphamide (Cy) and Melphalan (Mel) according to the patients' clinical conditions.

Results: A total of 89 transplants were performed between 2017 and 2023 for pediatric AML. Of these, 15 transplants in 13 patients were performed for refractory AML (two second HSCT were for relapse and graft failure, one each). The median age was 8.2 years and 54% of the patients were male. In 40% of the patients, AML was FAB-M4 (FAB), followed by M1 (20%) and M7 (20%). Donors were 80% haploidentical (haplo), 13% unrelated (MUD) and 7% a matched sibling (MSD). The graft was bone marrow in 9 (60%) and in 40%, peripheral blood. All 15 HSCT used a myeloablative regimen (MAC): 4 (27%) Bu-Flu-Mel, 2 (13%) Flu-TBI and 8 (53%) adapted FLAMSA. GVHD prophylaxis used PT-Cy, calcineurin inhibitor (CI) – MMF in Haplos, CI and Methotrexate in MUD and CI in MSD. Only 4 patients received DLI, but 8 of 13 patients (62%) developed acute or chronic graft-versus-host disease (GVHD). Eight of 13 patients died of relapse (4), infection (3) or alveolar hemorrhage (1). Of the 6 patients receiving Bu-Flu-Mel of Flu-TBI, only 1 remains alive in remission. Of the 8 patients who underwent adapted FLAMSA, 2 died of relapse, 2 died of infection and 4 remain alive and disease free a median of 4.4 months (75 – 377 days) after the HSCT.

Conclusion: The adapted FLAMSA regimen may cytoreduce the tumor burden with a low toxicity prior to HSCT, demonstrating that it may be possible to improve survival of patients with refractory/relapsed AML.

IMMUNE RECOVERY AND THE ROLE OF CD4 AND CD8 RECENT EMIGRATED T LYMPHOCYTES IN PEDIATRIC HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Adequate reestablishment of thymopoiesis is critical for long-term immune reconstitution after transplantation, possibly impacting survival rates. Multiparametric flow cytometry (MFC) can identify and quantify T-cell subpopulations, allowing a better understanding of each patient's immune status.

Objective: Evaluate the reactivation of thymic function through recent thymic emigrants (RTE) analysis after hematopoietic cell transplantation (HCT). Casuistic: We included 186 children (114M/72F) transplanted in two HCT centers between 2013 and 2020, median age 7.8y (0.2-17.8), 67.7% under 10 years. Majority had nonmalignant diseases (59.1%), received transplants from alternative donors (81.2%) and bone marrow as stem cell source (91.2%). 102(54.8%) patients received myeloablative and 84 reduced intensity conditioning transplants. GvHD prophylaxis was CSA+MTX (54%) and PTCy+CSA+MMF (37%). 101 patients received ATG and 93 received TBI (>400 rads, n=59; and 200-400 rads, n=34). 52 patients developed acute-GvHD (a-GvHD) median of 30 days after HCT (13 -214), being 30 grade I-II and 22 grade III-IV. Median time for neutrophil and platelet engraftment were 19 and 22 days, respectively. Median follow-up after HCT was 1236 (140 - 3316) days.

Methods: CD3 T-cell and subsets were done at three time-points: D+100 (n=130), D+180 (n=93) and D+360 (n=76). Recent thymic emigrants were defined by co-expression of CD4+CD31+CD45RA+ or CD8+CD31+CD45RA+ in MFC. IBM SPSS Statistics v.28.0 and EZR v.1.53 were used for statistical analysis.

Results: D+100: patients <10y had higher RTE CD4 counts (5.3/µL range 0-115) vs >10y (2.2/µL, range 0-17.5), p=0.022. Median recovery of RTE CD4 was higher in MRD 7.9 cell/µL (0-69.6) compared to MUD 4.4 cell/µL (0-115) or haploidentical donors 2.4 cell/µL (0-32.2), p=0.024, and higher in patients not using ATG (6.5/µL vs 2.4/µL) p=0.007. At analysis of RTE CD8 only patients <10y had significance (72.8/µL vs 48/µL, p=0.049). D+180: presence and degree of aGvHD significantly influenced RTE CD4 recovery (p<0.001 for both). Higher degree aGvHD had lower RTE CD4: grade III-IV (median 6.0/µL, 0–65.5) vs grade I-II (28.1/µL, 0.2–279.6) and patients without GvHD, median 56.8/µL (1.0–505.2). Patients with CMV reactivation had a higher RTE CD8 (median 204.6/µL, 2.9-2514) vs no reactivation (100.2/µL, 2.0-885.6), p=0.022. D+360 no variable was significant in relation to RTE recovery. Survival: Overall survival 87.7% at 5-year follow-up, median 1170 days (122 to 3316 days). Age <10y (p=0.045), CMV donor serology (p=0.0145) and aGvHD (p=0,0026) negatively impact survival in multivariate analysis. Other pre-transplant and immunological variables do not show difference in survival.

Conclusion: Thymic regeneration pattern was influenced by patient age, haploidentical HCT, use of ATG and presence of acute GVHD. Flow cytometry RTE CD4+CD31+CD45RA+ monitoring from the third month after HSCT may be used to verify recovery of thymic function.

FIGURE 1: Reconstitution of RTE T lymphocytes after HSCT, absolute values (cells/µl) CD4+CD31+CD45RA+ (A) CD8+CD31+CD45RA+ (B). The edges of the boxes indicate the 25th and 75th percentiles, the lines within the boxes indicate the median, and the error bars extend from the smallest to the largest value.

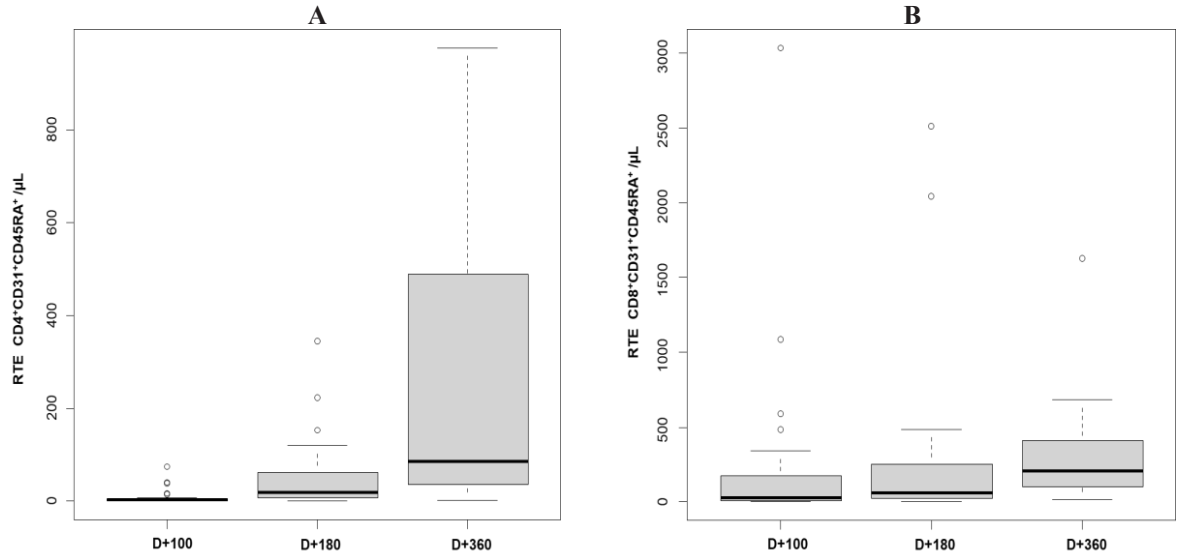

TABLE 1: Patients characteristics (n=186)

Patients	N (%)	Survival-rate (1 year)	p-value
Hospital Hospital 1 Hospital 2	102 (54.8%) 84 (45.2%)	0.960 (0.898-0.985) 0.940 (0.863-0.975)	0.769
Age at HSCT <10 year ≥10 years	126 (67.7%) 60 (32.3%)	0.976 (0.927-0.992) 0.900 (0.791-0.954)	0.045
Sex Male Female	114 (61.3%) 72 (38.7%)	0.965 (0.908-0.987) 0.931 (0.841-0.970)	0.895
Diagnosis Malignancy Bone marrow failure syndromes Primary immune deficiency Inborn erros of metabolism	76 (40.9%) 69 (37.1%) 34 (18.3%) 7 (3.8%)	0.921 (0.833-0.964) 0.971 (0.841-0.970) 0.969 (0.798-0.996) NA (NA - NA)	0.605
Stem cells source BM PB	171 (91.9%) 15 (8.1%)	0.959 (0.915-0.980) 0.867 (0.564-0.965)	0.358
Donor type MUD Haploidentical MRD	88 (47.3%) 63 (33.9%) 35 (18.8%)	0.932 (0.885-0.969) 0.967 (0.876-0.992) 0.971 (0.814-0.996)	0.983
Conditioning regimens Myeloablative (MAC) Non myeloablative (RIC)	102 (54,8%) 84 (45.2%)	0.964 (0.893-0.988) 0.941 (0.873-0.973)	0.931

Prophylaxis of GVHD CSA + MTX CSA + PTCy + MMF CSA + other drugs	101 (54.3%) 69 (37.1%) 16 (8.6%)	0.941 (0.873-0.973) 0.956 (0.869-0.986) 1.000 (NA - NA)	0.154
Use of ATG Yes No	101 (54.3%) 85 (45.7%)	0.950 (0.884-0.979) 0.953 (0.879-0.982)	0.729
Use of TBI Yes >400 rads 200 – 400 rads No	93 (50.0%) 59 (31.7%) 34 (18.3%) 93 (50.0%)	0.898 (0.778-0.953) 0.971 (0.809-0.996) 0.978 (0.915-0.994)	0.152
CMV patients serostatus Positive Negative	165 (88.7%) 21 (11.3%)	0.945 (0.897-0.971) 1.000 (NA - NA)	0.136
CMV donor serostatus Positive Negative	155 (83.3%) 31 (16.7%)	0.974 (0.933-0.990) 0.833 (0.644-0.927)	0.0145

ATG, antithymocyte globulin; BM, bone marrow; PTCy, cyclophosphamide; CMV, Cytomegalovirus, CSA, cyclosporine, MMF, mycophenolate mofetil, MRD, allogeneic hematopoietic cell transplantation from HLA-matched related donor, MUD, allogeneic hematopoietic cell transplantation from HLA-matched unrelated donor, MTX, methotrexate, HSCT, hematopoietic stem cell transplantation; PB, peripheral blood, TBI, total body irradiation.

TABLE 2: Multivariate statistical analyses Cox Regression Overall Survival em relation to RTE CD4+ recovery (n=186).

Covariates	Hazard Ration	p
Acute GvHD: Time-dependent covariate	4.49 (1.69-11.9)	0.0026
Donor Serology (Ref. positive)	4.89 (1.72-13.9)	0.0029
Age 10 years (Ref. <10 years)	2.69 (1.06-6.8)	0.038
CD4+ T - D+100 <50 cells/µL	1.62 (0.34-7.58)	0.54
CD4+ T - D+100 median 129 cells/µL	2.04 (0.51-8.11)	0.31
CD4+CD31+CD45RA+ T RTE - D+100 median <4,3/µL	0.77 (0.23-2.54)	0.67
CD4+CD31+CD45RA+ T RTE - D+180 median <41/µL	2.47 (0.26-23.3)	0.43

GvHD, Graft-versus-Host Disease, REF, reference, RTE, recent thymus emigrated.

PEDIATRIC ACUTE PROMYELOCYTIC LEUKEMIA HAS EXCELLENT RESULTS WITH AUTOLOGOUS AND ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT).

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Introduction: Acute Promyelocytic Leukemia (APL) has a high early morbidity and mortality, but a high cure rate. Primary refractory or relapsed disease are referred to HSCT. Patients with molecular remission undergo autologous, and allogeneic HSCT is reserved for those with molecular resistance/persistence or multiple relapses. It is the only pediatric leukemia for which autologous HSCT is indicated, as it is believed that there is no significant graft-versus-leukemia (GVL) effect. There is scarce information on the outcome of HSCT for pediatric APL, and none to our knowledge in Brazil.

Objective: To review the results of autologous and allogeneic HSCT performed for the treatment of pediatric APL.

Method: retrospective analysis of the medical records of all patients with APL referred to HSCT.

Results: A total of 121 HSCT were performed for AML between 2003 and 2023, 15 of them for APL. Three patients had central nervous system (CNS) disease prior to HSCT. The median age was 13.6 years (7.8 - 21.7); 27% were female. Three patients were transplanted in 1st remission due to prior molecular persistent disease; 8 in second remission, and 4 in very advanced disease.

Ten patients underwent autologous HSCT, 7 of them after arsenic (ATO)-based therapy; 9 had Busulfan-based conditioning and 1 TBI-based due to CNS relapse. With a median follow-up of 126 months, all patients were alive. Two patients received ATO post autologous HSCT, one due to molecular relapse and the second due to disease detected by PCR in the graft.

Five patients underwent allogeneic HSCT due to very advanced disease. Donors were HLA-identical related (3), MUD (1) and haploidentical (1); ATO was used pre HSCT in two of them. All patients were in morphological remission, but one had persistent molecular disease. Three patients had Busulfan-based conditioning and 2 TBI. Three are alive with a median follow-up of 117 months.

Conclusion: in this retrospective cohort, both autologous and allogeneic transplantation were effective therapies. All 10 patients are alive after autologous HSCT. Three of 5 patients with very advanced disease are alive and disease and GVHD-free.

Keywords: acute promyelocytic leukemia, arsenic trioxide, autologous transplantation, allogeneic transplantation, pediatric.

INFECTIOUS COMPLICATIONS

QUANTIFERON-CYTOMEGALOVIRUS AFTER ALLOGENEIC STEM CELL TRANSPLANTATION: PREDICTION OF CMV RECURRENCE AND CLINICALLY SIGNIFICANT INFECTION

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Background: Cytomegalovirus reactivation (CMVi) is a frequent complication after allogeneic hematopoietic stem cell transplantation (Allo HSCT), impacting overall survival. Standard care includes surveillance of CMV viral load, pre-emptive therapy for clinically significant CMVi (csCMV), and, more recently, prophylaxis with letermovir until D+100. Risk factors for CMVi include prior CMV exposure in recipients (R+) and donors (D+), HLA mismatch or haploidentical donors, graft-versus-host disease (GVHD), and others. High-risk patients are more prone to recurrent CMVi and to develop refractory to treatment CMVi. The Quantiferon CMV test (QF-CMV) assesses T-cell immunity by measuring interferon-gamma released by CMV-specific T-cells in response to CMV antigens, quantifying the anti-CMV immune response. In this cohort, we analyzed the ability of QF-CMV to stratify risk for CMVi and csCMV in Allo HSCT recipients.

Methods: We conducted a prospective cohort study with adult Allo HSCT recipients from a single center. CMV-negative serology recipients with CMV-negative donors were excluded. The QF-CMV test was performed inconvenience, and data regarding GVHD status, lymphopenia, serum IgG, and quantitative CMV PCR surveillance before and after testing were collected. Of note, no patient included was on or had previously received letermovir prophylaxis. The outcomes were the cumulative incidence of CMVi and csCMV after three months from the QF-CMV test by time-to-event analysis.

Results: In the study, 35 patients were enrolled. R+ was 97%, and 54% of donors were haploidentical. 54 QF-CMV tests were conducted, with 13 patients undergoing multiple tests. The tests were performed at a median time of D+100, ranging from D-8 to D+1000. Among the tests, 3 (5.6%) were conducted prior to graft infusion, 24 (44.4%) were performed until D+100, 18 (33.3%) were conducted between D+100 and D+365, and 9 (16.7%) were done after D+365. Out of the 54 tests, 48.1% (26) were positive, 24.1% (14) were negative, and 27.8% (15) were indeterminate. Most indeterminate results occurred before D+100 (80%; p=0.049) and in patients with no CMVi before testing (60%; p=0.036). Lymphopenia was predictive for indeterminate results (p<0,01). Three months after testing, CMVi and csCMV cumulative incidence were 39.8 and 23%, respectively. According to QF-CMV results, the CMVi and csCMV incidences were 22%, 50%, and 67% (p=0.051), and 12.7%, 18.2%, and 62% (p=0.034) for QF-CMV positive, QF-CMV negative or indeterminate, respectively. Lymphopenia and Donor serologic negative (R+D-) were significantly associated with CMVi and csCMV in the cohort.

Conclusions: The results of QF-CMV were associated with different incidences of CMVi and csCMV in high-risk stem cell transplant recipients. The indeterminate result marked a very high risk for CMVi and csCMV, probably because it marked a severe impact on cellular immunity.

USE OF LETERMOVIR FOR CYTOMEGALOVIRUS PROPHYLAXIS AFTER ALLOGENEIC STEM CELL TRANSPLANTATION: A SINGLE-CENTER REAL-LIFE EXPERIENCE

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Introduction: Cytomegalovirus (CMV) infection remains a significant concern in Allogeneic hematopoietic stem cell transplantation (allo-HSCT). Letermovir has emerged as a promising prophylactic agent against CMV reactivation in this patient population. However, there is limited knowledge about its use in allo-HSCT patients in Brazil.

Objective: To present the institutional experience with letermovir prophylaxis in patients undergoing Allo-HSCT.

Methods: A retrospective analysis was conducted on a cohort of 34 patients who underwent allo-HSCT between December 2021 and May 2023. These patients received letermovir prophylaxis, with the dosage adjusted based on concomitant cyclosporine administration. The daily dose of letermovir was 240 mg when co-administered with cyclosporine, or 480 mg when used without cyclosporine. The medication was administered orally for a minimum of 100 days, starting on Day +5 post-transplantation, with one exception where it was started on D+18 and another exception where it was started on D+21.

Results: The clinical characteristics of the patients who received letermovir are presented in Table 1. During the prophylactic period, only two individuals had CMV reactivation, both in the context of grade IV intestinal, skin, and liver graft-versus-host disease (GVHD). Additionally, two cases of CMV reactivation were documented: one patient discontinued the treatment on her own, while another patient had to temporarily suspend letermovir due to adverse drug reactions. Subsequently, letermovir was reintroduced as maintenance therapy. It is noteworthy that both instances of CMV reactivation in patients receiving letermovir prophylaxis occurred in the presence of grade IV GVHD and significant immunosuppression. These patients were receiving three classes of immunosuppressive agents, underscoring the severity of their clinical conditions. Despite the challenging clinical scenarios, the duration of ganciclovir treatment was shorter than traditionally observed prior to the availability of letermovir. Most patients were discharged with letermovir, except for three fullmatch transplant cases where the medication was not approved by the payer, leading to reactivation in two cases. Only 5 patients did not receive letermovir prophylaxis during this period, primarily due to non-approval by the payer. Among these patients, only one case did not experience reactivation.

Conclusion: Our institutional experience with letermovir prophylaxis in patients undergoing allo-HSCT demonstrated its potential as a promising agent against cytomegalovirus (CMV) reactivation. The low incidence of CMV reactivation during the prophylactic period, with only two cases observed, reflects the effectiveness of letermovir in preventing CMV infection in this patient population. Overall, our findings contribute to expanding the knowledge of letermovir use in the context of allo-HSCT in Brazil.

Keywords: Cytomegalovirus, CMV, Letermovir, allogeneic hematopoietic stem cell transplantation, allo-HSCT

TABLE 1. Distribution of allogeneic HSCT patients with Letermovir prophylaxis during December 2021 to May 2023

Number of Transplants	n= 34	
Gender n (%)		
Female	18	(52.94)
Male	16	(47.06)
Age		
Median (Q1- Q3)	48	(23-73)
Pathology n (%)		
Acute Myeloid Leukemia	18	(52.95)
Chronic Myeloproliferative Disease	3	(8.82)
Acute Lymphoblastic Leukemia	5	(14.71)
Myelodysplastic Syndrome	3	(8.82)
Non-Hodgkin Lymphoma	3	(8.82)
Severe Aplastic Anemia	1	(2.94)
Adult T-cell Leukemia	1	(2.94)
Transplant Type n (%)		
100% Related	13	(38.24)
Haploidentical Related	21	(61.76)
Seroconcordant n (%)		
Yes	28	(82.35)
No	6	(17.65)

EPIDEMIOLOGICAL PROFILE OF HEALTHCARE ASSOCIATED INFECTIONS CAUSED BY CLOSTRIDIOIDES DIFFICILE IN PEDIATRIC HEMATOPOIETIC STEM CELL TRANSPLANTATION RECIPIENTS

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Introduction: Clostridioides difficile (C.difficile) is an intestinal commensal bacteria most commonly identified in patients in use of prolonged antimicrobial therapy, immunossupressed patients and contacts, because its spores are resistant to alcohol solutions, which are commonly used in hospital hygiene. Diarrhea caused by C.difficile is a common complication after hematopoietic stem cell transplantation (HSCT), its incidence 9 times higher in these patients than in the general population.

Methods: Descriptive retrospective study analyzing healthcare associated infections (HAIs) caused by C. difficile identified by the Epidemiology and Hospital Infection Control Service, at the HSCT Unit. ANVISA Diagnostic Criteria were used for HAI definition.

Results: During the study period 243 HSCT were performed, mostly haploidentical (42%, n= 102), unrelated (URD) (26,7%, n= 65), autologous (17,3%, n=42) and related transplants (R) (14%, n=34). Out of all HSCT, 60,5% (n=147) of patients had Malignant Disease as primary diagnosis, Bone Marrow Failure (18,9%, n=46); Inborn Errors of Immunity (IEIs) (14,4%, n=35) and Inborn Errors of Metabolism (IEM) (6,2%, n=15). During the study period 419 C. difficile investigations were performed in post HSCT patients, 14,5% (n= 61) having a positive result. 32 HAIs caused by C.difficile were identified, 7 in 2019, 4 in 2020, 9 in 2021 and 12 in 2022. These infections were more frequent in haploidentical HSCT (46,9%, n=15), URD (28,1%, n=9), autologous (15,6%, n=6) and R (9,4%, n=3) transplants, mostly in patients with Malignant Disease as primary diagnosis (81,3%, n=26), Bone Marrow Failure, IEIs and IEM were 6,3% of all cases (n=2), each. The majority of HAIs caused by C.difficile happened after HSCT (81,3%, n=26), with median of 2,5 days after transplantation (D0 to D+640). 43,8% (n=14) occurred during neutropenia, 31,3% (n=10) with mucositis and no infections happened with graft versus host disease. 3 patients (9,4%) had a previous positive result for C.difficile, according to laboratory result data from the Institution. Most patients (68,8%, n=22) used antimicrobial therapy in the 15 days before infection, main ones being: piperacillin-tazobactam (43,8%, n=14), meropenem (18,8%, n=6), cefepime (12,5%, n=4) e vancomycin (9,4%, n=3). Diarrhea was present in every HAI case, fever in 75% (n=24), abdominal pain in 43,8% (n=14) and presence of blood in feces in 2 cases (6,3%). All patients had resolution of symptoms.

Conclusion: HAI cases caused by C.difficile increased throughout the years, with a positivity rate similar to literature (6 to 27%). Infection occurred mostly in allogeneic transplants, after antimicrobial therapy and in patients with malignant disease as primary diagnosis, which are known risk factors for C. difficile infection.

Key-words: HAI, Clostridioides difficile, C.difficile, HSCT.

THE USE OF CYCLOPHOSPHAMIDE POST TRANSPLANTATION AND THE INCIDENCE OF VIRAL AND BACTERIAL INFECTIONS – EXPERIENCE OF A TREATMENT CENTER IN BRAZIL

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Introduction: With the increasing use of alternative donors in hematopoietic stem cell transplantation (HSCT), we are committed to the post-transplant cyclophosphamide (PTCY) platform as a form of immunosuppression. The use of PTCY has revolutionized haploidentical transplantation, and based on two recent phase III studies, it is also being used in unrelated transplantation with reduced intensity conditioning (RIC) and in identical relatives. As described in the literature, patients who do not use PTCY have a risk of viral reactivation of around 23%; in those who use PTCY, it has an incidence of 42% and 37% in haploidentical HSCT and NAP/AP, respectively.

Objective: to evaluate the toxicity of PTCY-based prophylaxis and the incidence of infections in this scenario in a private institution in Brazil, from January 2017 to April 2023. Methods: This is a retrospective, single-center, descriptive study. We defined viral infection when the presence of any viral load of CMV, BK virus, EBV and adenovirus was detected, whereas bloodstream infection was defined as positive blood culture, both up to D+100 after HSCT.

Results: We collected data from 68 patients who received PTCY prophylaxis: 19 patients undergoing AP-HSCT/NAP and 49 patients undergoing haploidentical-HSCT. The most used source in both groups was peripheral blood as well as RIC conditioning. The median follow-up was 17 months with a 1-year overall survival of 74% in the HSCT-AP/NAP group and 65% in the haploidentical group. Regarding CMV viral reactivation, 49% and 55% were observed in each group, respectively. The use of letermovir was associated with protection against CMV reactivation (HR = 0.32, p = 0.03) in the multivariate analysis, as well as a trend towards greater risk with haploidentical transplantation (HR = 2.21, p = 0.05). With regard to the other viruses analyzed, there was no significant difference between the groups. We also did not observe a relevant difference between the groups regarding the incidence of bloodstream infection. We observed that there were no cases of hemorrhagic cystitis in AP/NAP transplant recipients, whereas in haploidentical donors there were 7 cases (10%). Of these patients, all identified a viral agent involved in the etiology of hemorrhagic cystitis, such as adenovirus and/or BK virus.

Conclusion: Our results show a similar infection profile between haploidentical, NAP and related transplants when PTCY-based prophylaxis is used. However, attention is drawn to the absence of viral hemorrhagic cystitis in AP/NAP transplantation, in contrast to the 10% occurrence in haploidentical HSCT. We also show the effectiveness of letermovir in patients receiving PTCY-based prophylaxis. The main limitations of this study are its retrospective nature and small sample size, which may decrease the power to detect differences. Larger and preferably prospective studies are needed.

Keywords: Cyclophosphamide post-transplantation, immunosuppression, bacterial infection, viral infection.

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DISPOSAL OF CPH BAGS CARRIED OUT BY THE HEMOCE CELL PROCESSING CENTER

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Introduction: The Cell Processing Center (CPC) of the Hematology and Hemotherapy Center of the State of Ceará (HEMOCE) started its activities in 2008, being responsible for the processing and cryopreservation of hematopoietic progenitor cells for bone marrow transplantation in 3 transplant centers (TC) in the state of Ceará, two privates and one public. All HPC bags processed and cryopreserved are stored in a -80° freezer, remaining until the time of transplantation. Part of the cryopreserved bags end up not being used for different reasons and the organization and maintenance of stocks has become an important problem for the institution. We started discarding bags, in accordance with literature, as of June 2022. IT CPC 28, developed in the sector, guides the following criteria for disposal: bags thawed and not infused after 24 hours, fresh for more than 72 hours without cryopreservation, deceased patients with death certificate or positive blood culture for Gram-negative or fungus. Specific cases are discussed between the medical staff of the CPC and the transplant center.

Aim: Report the experience in disposing of HPC bags, requested by the doctor of the transplant center to the CPC of HEMOCE.

Materials and Methods: Qualitative retrospective analysis of the disposal process and quantitative analysis of discarded products. The physician at the transplant center sends a document justifying the disposal and supporting material (death certificate or summary issued by the hospital where the death occurred). This is evaluated by the CPC physician who, if in agreement, fills out the Hematopoietic Stem Cell Disposal Registration form. This is then forwarded to the technical team that separates the product and records the disposal. It is sent to the solid waste sector for incineration, which certifies that the service has been carried out.

Results: Initially, the transplant centers were informed and lists of stored products were forwarded. Only two CTs sent information and requests. Some difficulties are reported, such as: CT adherence, difficult access to death certificates, when the patient does not die at the referral hospital, patient location, especially autologous HSCT that they end up following up with the original physician.

91 HPC bags from 28 patients were discarded, 9 autologous and 24 allogeneic, 7 bags were discarded due to positive blood culture referring to the same patient, 2 bags were discarded at the request of the transplant center (CD34: 0.4x106/Kg in already transplanted lymphoma), and the others were discarded due to death.

Conclusion: The disposal of cryopreserved products is a necessary process for the smooth running of the CPC, optimizing space and resources. With well-defined criteria, there is legal certainty for disposal. Means of accelerating the process are being studied, such as: a social worker at HEMOCE to actively search for patients and declare deaths, with patient authorization after a long cryopreserved period.

Keywords: Hematopoietic Progenitor Cells (HPC), HPC Disposal, Cell Processing Cente.

MOLECULAR ALTERATIONS IN HEMATOPOIETIC NICHE: THE ROLE OF MESENCHYMAL STROMAL CELLS IN ACUTE MYELOID LEUKEMIA

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Acute Myeloid Leukemia (AML) is an extremely heterogeneous hematological neoplasm, however, its origin is unique from transformation of Hematopoietic Stem Cell (HSC) into Leukemic Stem Cell (CTL). It is believed that alterations in Mesenchymal Stromal Cells (MSC) signaling, key components of the hematopoietic niche, may be related to this transformation. However, the exact contribution of these molecular changes to the pathogenesis of AML is still poorly understood. Thus, the aim of this work was to study the signaling between MSCs and HSCs, in order to contribute to the understanding of the mechanisms related to AML development. For this, we used bone marrow (BM) samples from healthy donors (HD) and AML patients at diagnosis for the isolation of MSC and enrichment of CD34+ cells. Cells were co-cultured using transwell system for 72 hours to assess the impact of the influence of signaling from MSC derived from AML patients (MSC-AML) on healthy HSC. Two co-culture conditions were performed: the AML condition where we used MSC-AML with CD34+ cells from HD and the control condition (MSC-HD and CD34+/HD). After the co-culture, we performed the proteomic analysis of the collected supernatant. When we comparing the secretome of the two conditions, we identified 15 differentially expressed proteins indicating that the MSC-AML secretome is altered. Among these proteins, the SLPI protein showed its expression increased in the AML condition. SLPI has already been associated to important processes for the maintenance of the hematopoietic niche, such as homeostasis of the hematopoietic system, regulation of proliferation, cell cycle and apoptosis. However, in AML, the role of SLPI is still unknown. Increased SLPI expression was confirmed in ELISA assays with bone marrow plasma samples from AML patients and healthy donors. Furthermore, when we evaluated the gene expression of MSC-AML isolated cultured, we also observed an increase in SLPI expression at the mRNA level. It has already been described that secreted SLPI is capable of acting as a transcription factor and regulating cell cycle genes, myeloid differentiation and proliferation of CD34+ cells. In order to verify whether the increase in SLPI expression was capable of altering the gene expression of CD34+ cells, we evaluated the transcriptomic profile of these cells by chiparray assay. Our results showed that several genes previously described as being altered by SLPI are altered in CD34+ cells, suggesting that this secreted protein may play an important role in the regulation of cell cycle genes. Thus, we suggested that the MSC-AML secretome is altered, and this altered signaling is potentially capable of altering HSC gene expression. Therefore, we believe that MSC-AML may act as important role in the development and/or progression of AML.

Keywords: Acute Myeloid Leukemia. Hematopoietic Niche. Hematopoietic Stem Cells. Mesenchymal Stromal Cells

THE BEGINNING OF CAR T- CELL IN BRAZIL: APHERESIS FOR T-CELL COLLECTION IN PEDIATRIC AND ADULT PATIENTS

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Introduction: Chimeric antigen receptor (CAR) T-cell therapy is spreading hope all around the world for patients suffering from acute lymphoblastic leukemia (ALL) and diffuse large B-cell lymphoma (DLBL), providing for blood banks and cell processing centers a new challenge: collect lymphocytes from refractory, in second or later relapse patients where leukapheresis can be laborious due to their condition, but a successful collection is mandatory for effective manufacturing and treatment. Although this therapy has been done in many countries, in Brazil, it started in 2022. Our centers performed the first apheresis for CAR-T in Oct.2022.

Object: This study aimed to share our experience with apheresis and cell processing in successful collection of T-cells for CAR T-cell therapy in adults and pediatric patients. Methods: Data was collected from 21 leukapheresis aimed for CAR T-cell therapy with Tisagenlecleucel™ in 3 centers located in the south and southeast of Brazil. Between Oct. 2022 and Apr. 2023 we conducted 5 leukapheresis in patients with ALL and 11 with DLBL. Spectra Optia®, Terumo BCT, was employed for apheresis using the cMNC cell program. Apheresis success specification: total nucleated cell (TNC) count ≥2x109, CD3-positive lymphocyte counts ≥1x109 and ≥3% of T-cells in the product. Depending on the patient's venous anatomy, lymphocyte collection was through a central venous catheter access or a peripheral line.

Results: In this study we evaluated 16 patients and 21 apheresis run, 02 patients (1 adult and 1 pediatric) required 03 leukapheresis session and 01 adult patient a second leukapheresis session. Blood prime was required in 5 pediatric patients. No serious side-effects associated with leukapheresis were observed and all procedures were successful. Table 01 express results from patients, leukapheresis and product.

Conclusion: Our study included pediatric and adult patients who had two categories of diagnosis ALL and DLBL. Leukapheresis for CAR T-cell did not cause any serious side effects and enough quantity of CD3 positive lymphocytes for CAR T-cell production was collected despite heavy pretreatment and disease. The continuous evaluation of these emerging data will be critical to improving the outcomes of patients receiving CAR T-cell therapy.

TABLE 01: Results are expressed as median (range)

Patient		Cell count pre procedure		Apheresis Product Information	
Age (years)	40 (04-69)	WBC	4.16 (0.89-33.20)	Processed Blood Volume (L)	12.70 (3.05- 17.95)
	Pediatric 05 Adult 11	Lymphocytes	500 (1.22-2.53)	Volemia	3.20 (2.00-4.50)
Gender	Male 08 Female 08	Hct (%)	28 (21.00-39.50)	Run Time (min)	239 (132.00 – 299.00)
Weight (Kg)	51 (15-87)	CD3+ /µl	441 (77.30-2100)	Product Volume (mL)	198.50 (117.00 – 275.00)
Venous Access Type	Central: 15 Peripheral: 01			TNC x 109	7.20 (2.20 – 17.10)
Total Blood Volume (mL)	3.22 (1.05 –5.44)			CD3 x 109	2.98 (0.210 – 12.40)
				Inlet rate (ml/min)	54 (14.10 – 78.20)
				Collect pump rate (ml/min)	1 (0.80 – 1.10)
				Collection Efficiency (%)	65.80% (38.70-89.20)

UTILIZATION OF STORED PERIPHERAL BLOOD STEM CELLS TO SUPPORT SECOND HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Cryopreservation (CRYO) maintains the therapeutic properties of peripheral blood stem cells (PBSC), allowing clinical, regulatory, and logistical procedures needed for successful transplantation. Hematopoietic stem cell transplantation (HSCT) is used to treat or cure a wide spectrum of conditions. Complications of mobilizing and collecting additional PBSC following recovery from the myeloablative HSCT have led centers to adopt the practice of collection and storage of enough PBSC for two HSCT. However, the collection and storage of extra PBSC than that needed for a single HSCT have logistical, infrastructure, and cost issues.

Aim: To evaluate the collection, storage, and utilization practices of PBSC for two or more HSCT. Casuistry and methods: This cross-sectional study included patients referred for HSCT at eight transplant centers. CRYO, storage, and other laboratory procedures were conducted at a single facility between 2013 and 2022. Frozen cells were stored in the vapor phase of nitrogen (V5000-AB isothermal LN2 freezer, CBS, Bruce Twp., MI, USA). The records were reviewed to obtain information the regarding the patients and frozen cell therapy products, including diagnosis, age, sex, type of transplant, year of CRYO, and length of storage.

Results: our center released frozen PBSC for 1,311 transplantations between 2013 and 2022. Two hundred fifty patients had 321 bags with residual PBSC in storage after their 1st HSCT (234 autologous and 16 allogenic HSCT). Patients had a mean age of 49.6 ± 13.4 years, and most were male (162; 64.8%). Most (200; 80%) had multiple myeloma (MM), followed by leukemia (18; 7.2%), germ cell tumor (GCT, 14; 5.6%), and other diagnoses (18; 7.2%). Cells from 66, 163, and 21 patients were frozen 2 years or less ago, 2.1 to 7 years ago, and more than 7 years ago, respectively. Thirty-three bags from 24 (9.6%) patients were released for 2nd HSCT within a median of 2.2 years after the cryo. The mean age of patients at the time of the 2nd HSCT (23 autologous and one allogenic transplantation) was 51.6 ± 14.4 years, ranging from 18 to 69 years. Most were male (15; 62.5%) and had MM (15; 62.5%) followed by GCT (5; 20.8%), leukemia (3; 12,5%), and myelodysplastic syndrome (1; 4.2%). The remaining 288 frozen bags continue stored at our facility and represent about a third of our tank storage capacity. The human, infrastructure, and economic resources required to cryopreserve and store unused PBSC are equivalent to the resources needed to attend about 144 extra patients.

Conclusions: this study showed a low utilization of stored PBSC to support the 2nd HSCT. In public healthcare systems, resources should be used based on equity and effectiveness. Since most patients probably never undergo a 2nd HSCT, our institution changed its practices regarding PBSC collection, CRYO, and storage to support the 2nd HSCT. Currently, it is allowed only for diseases that benefit from tandem infusions.

Keywords: hematopoietic stem cell transplantation; peripheral blood stem cell; cryopreservation.

GENERAL TOPICS

BMT BRAZILIAN MAP: COMPARISON OF BMT MAP WITH EBMT ACTIVITY SURVEY AND ACTIVITY REPORT CIBMTR

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Introduction: Introduction: Brazil has a large and consolidated Hematopoietic Stem Cell Transplantation (HCT) program with 126 transplant public and private centers registered at the Ministry of Health. The country has an extensive territory, the regions have their particularities with unequal socio-economic conditions that reflect in some way in the transplant program. It is especially important to access transplant outcomes in the country and in its regions to seek public policies that favor equity. The platform called "Bone Marrow Transplantation Map (BMTMap)" (https://ameo.org.br/mapa-do-transplante-de-medula-ossea/) is a Brazilian website for the public, health care providers and patients that brings a view of transplantation in Brazil with data presentation of approximately 50% of transplants in the country and portrays the regions with their particularities.

Objective: To observe internal results in BMTMap and compare them with international data about HCT.

Method: The platform BMTMap was created in 2020. The centers received training and underwent to educational auditing for the correct completion of HCT data, the reports have been uploaded and updated twice a year, outcomes were checked using Business Intelligence tools. Using the available tolls in the BMTMap, we selected allogeneic transplant data performed in Brazil, and compared indication data by diagnosis, type of transplant and cell source with publications of EBMT Activity Survey and The Transplant Activity Report from CIBMTR regarding the year of 2020.

Results: In 2020, 716 allogeneic transplants were recorded on the BMTMap with the participation of 30 Brazilian transplant centers, in the European registry, 18,796 allogeneic transplants were registered from 690 participating centers in 50 countries and 9,026 transplants performed in the United States were registered in the CIBMTR. On the BMTMap, the main indications for transplantation were ordered in AML, ALL and MDS/MPN; while in EBMT and CIBMTR the order was AML, MDS/MPN and ALL. The main source of cells used both in our data and in international records was PBC, with a higher predominance in the record of EBMT 83.1% and CIBMTR 78.6% while it was 55.0% in the BMT Map (Table1).

Conclusion: The BMTMap is a tool that gathers national data and provides information on various aspects of HSCT. The layout of the platform, which includes several filters, allows the user to choose the information and customize their research, enabling the use of the tool to compare the profile of transplants performed in the country with data from international records. It was possible to observe some differences in indications, type of donors and source of cells. Several hypotheses arise to explain these differences, although it is necessary to observe over time to find out if there are real differences or there will be a tendency to approach international standards.

TABLE 1. Data of HSCT from BMTMap, EBMT and CIBMTR, 2020

	Map of BMT	EBMT Activity Survey	CIBMTR Activity Report
Transplants	**716**	**18,796**	**9,026**
Main indications			
Acute myeloid leukemia (AML)	230 (32.1%)	7,330 (38.9%)	3,373 (37.4%)
Acute lymphoblastic leukemia (ALL)	189 (26.4%)	3,195 (16.9%)	1,411 (15.6%)
Myelodysplastic diseases (MDS)/Myeloproliferative (MPN)	84 (11.7%)	3,383 (17.9%)	1,696 (18.7%)
Stem cell source			
Bone Marrow	305 (42.6%)	2,811 (15.0%)	1,507 (16.7%)
Peripheral Blood	394 (55.0%)	15,616 (83.1%)	7,097 (78.6%)
Cord Blood	6 (0.8%)	345 (1.8%)	422 (4.7%)
Bone Marrow + Peripheral Blood	7 (1.0%)	-	-
Unknown	4 (0.6%)	24 (0.1%)	-
Donor type			
HLA-id sibling	283 (39.5%)	5,592 (29.7%)	1,846 (20.5%)
Haploidentical	281 (39.2%)	3,790 (20.2%)	2,338 (25.9%)
Unrelated	152 (21.2%)	9,414 (50.1%)	4,842 (53.6%)

DEVELOPMENT OF A DASHBOARD FOR CIBMTR AFFILIATED CENTERS USING A BUSINESS INTELLIGENCE TOOL

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Introduction: The Center for International Bone Marrow Transplant Research (CIBMTR) collaborates with the global scientific community to advance Hematopoietic stem cell transplantation (HSCT) and other cellular therapy (CT) worldwide. The Data Back to Center (DBtC) is a tool which allows HSCT centers to extract their data in a standardized and codified way. The partnership between the Brazilian Cellular Therapy and Bone Marrow Transplant Society (SBTMO) and CIBMTR allowed the return of Brazilian data registered in the CIBMTR, through the DBtC. Through this returned data, it is possible to know the outcomes of each center. Using a business intelligence tool can be very useful to understand the HSTC results. However, not all centers have statistician or person with expertise in developing solutions applying advanced technological resources.

Objective: To demonstrate a dashboard template developed by using Power Business Intelligence (PBI) with data extracted from the DBtC with the aim of the HSCT centers to know their own results.

Methodology: A dashboard template was created by using PBI based on fields of data extracted from the DBtC. Functions were created to totalize the number of HSCTs performed; to remove spaces from field names; to categorize and to group disease status prior to transplant for acute leukemia diagnosis; to convert status indicator (censor = 0, event = 1). Filters were created by transplant type, disease, disease status prior transplant, transplant year and adult/pediatric classification, in order to enable some interactive reports. In addition, survival curves were created using R script visual in PBI. For sharing the dashboard template with other centers, it was elaborated a manual including software requirements, PBI setting, steps to download the DBtC file and data source settings and for setting R script in PBI. The developed dashboard template file (Figure 1) and the manual were sent by email to five data managers (DM) and to a North American Hospital.

Results: One DM could not install the template yet because he is waiting for permission from IT area. Thus, the template was completely tested by four DM. The main difficulties were PBI and R software installation, installing the necessary packages for the survival curves, and downloading the DBtC file. In order to help the DM, some extra instructions were done by WhatsApp and by virtual meeting. Regarding to North American Hospital, we have been planning a virtual meeting to discuss the dashboard.

Conclusion: Dashboard development using business intelligence tools is a difficult task and it is necessary to have a qualified person and technical knowledge. To run the template, open-source software was used, which can be installed on a local machine or on a network. The future perspective is to create video instructions and present the project to the SBTMO coordinator with the aim of approving the sharing of the template with all CIBMTR affiliated centers in Brazil.

FIGURE 1: **Dashboard template.**

IMPLEMENTATION OF A SYSTEMATIZED PROCESS FOR TRANSMISSION, AND ASSESSMENT OF CLINICAL HEMATOPOIETIC STEM CELL TRANSPLANT (HSCT) DATA TO THE CENTER FOR INTERNATIONAL BLOOD AND MARROW TRANSPLANT RESEARCH (CIBMTR)

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Introduction: systematic and accurate reporting of clinical data to the CIBMTR is a minimal requirement for the specific HSCT accreditation by the Foundation for the Accreditation of Cellular Therapy (FACT) and it is a great challenge for a transplant service, since it involves dedication of a professional to understand, capture, report the data and to evaluate the accuracy of these reported data.

Objective: to systematize the process of collection, transmission, and evaluation of the accuracy of clinical data reported to the CIBMTR, as an integral part of the HSCT quality management program.

Method: this is an experience report study, carried out in a private general hospital in the city of São Paulo, from November 2021 to May 2023, in which was constructed a structured template for the admission, daily notes, and discharge of the patient, based on the critical fields of the CIBMTR.

A specific form was also created to capture data from patients transferred back to the service of origin after the HSCT. Regular audits were performed, and an indicator was adopted to capture the accuracy of data entry and the presence of critical documents in the patient's electronic medical records (documentation of diagnosis and staging, signed CIBMTR informed consent form, histocompatibility test results, anti-HLA reactivity panel, donor eligibility form). Our goal was to report the essential forms within 30 days of the HSCT and have accuracy in at least 98% of the CIBMTR critical data fields.

Results: Before the implementation of the structured medical notes, the average number of hours for the first 40 patients from opening to completing each critical form was 158 hours. After the implementation of the program, the average has decreased to 78 hours and many forms are opened and completed on the same day. In the audit of the accuracy of reported data, the overall compliance result of the patients reported within the first 6 months of reporting was 94%; in the past 6 months, the accuracy has increased to 97%.

Conclusion: The implementation of a systematized process the electronic medical records, collection, and transmission of clinical data to the CIBMTR improved accuracy in data reporting, which represents a fundamental component of the processes related to quality and patient safety.

SUBMISSION OF COMPLEMENTARY SEQUENCE FOR 90 CLASS I HLA ALLELES: ENHANCING THE CHARACTERIZATION OF HLA DIVERSITY

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The Human Leukocyte Antigen (HLA) system plays a crucial role in immune allorecognition and exhibits high individual diversity. Accurate and comprehensive characterization of HLA alleles is essential for disease association studies, transplantation compatibility assessments, and population genetics. The International ImMunoGeneTics Information System (IMGT) serves as official source for HLA data. In IMGT release 3.52.0, 37,068 alleles are characterized, including 24,828 classic Class I alleles (HLA-A, HLA-B, HLA-C). However, many of these alleles miss complete information, only 59.4% presents complete genomic sequences, 1.7% full exons, and 38.9% partial exons.

Our aim was to identify Class I HLA alleles with partial sequences in our NGS HLA database and submit them for sequence complementation in the IMGT database.

We identified 90 partial Class I HLA alleles (25 HLA-A, 37 HLA-B, 28 HLA-C) eligible for submission. These additions enhance the existing repertoire of HLA allele sequences, providing a more comprehensive representation of HLA diversity.

Completing these sequences holds significant importance for the scientific community. Firstly, it expands the reference dataset, ensuring accurate representation of HLA alleles in diverse populations, particularly those underrepresented in the current database. This facilitates a precise understanding of HLA diversity across various ethnicities and regions.

Moreover, the availability of complete allele sequences improves HLA typing methodologies, even for NGS data, as incomplete reference sequences can affect HLA typing algorithms differently. Researchers and clinicians can refine HLA genotyping techniques using these additional sequences, reducing ambiguities and enhancing resolution in identifying HLA alleles. This advancement contributes to more reliable clinical decisions, particularly in transplantation contexts.

Additionally, submitting these complementary sequences reflects the collaborative effort within the scientific community to continually update and improve the knowledge base of HLA genetics. By sharing these findings, we contribute to refining HLA nomenclature, fostering a standardized and unified framework for HLA allele classification and annotation.

In conclusion, IMGT relies on contributions from the scientific community to keep its database updated. The submission of complementary sequences for 90 Class I HLA alleles represents a significant contribution to the IMGT database, enriching the data available for researchers and clinicians worldwide. This ongoing collaboration ensures the accuracy and completeness of the IMGT database, leading to improved patient care, enhanced understanding of immune responses, and deeper insights into the genetic basis of human health and disease.

THE PRESENCE OF PIRCHE-II IN GRAFT-VERSUS-HOST DIRECTION IS ASSOCIATED WITH HIGHER RISKS OF ACUTE GVHD AFTER UNRELATED DONOR TRANSPLANTATION FOR NONMALIGNANT DISEASES

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Previous studies have shown that the Predicted Indirectly Recognizable HLA Epitopes (PIRCHE) algorithm, an in silico model of indirect T-cell alloreactivity, predicts acute graft-versus-host disease (aGvHD) after 10/10 unrelated donor hematopoietic cell transplantation (URD-HCT) for malignancies. In this model, the patient's HLA-DP-mismatched peptides are presented by shared HLA-A/B/C (GvH-PIRCHE-I) or shared HLA-DR/DQ (GvH-PIRCHE-II). In the non-malignant diseases (NMDs) setting, however, the impact of GvH-PIRCHE scores is currently unknown. Therefore, our study sought to validate whether the presence of GVH-PIRCHE I/ II would be associated with higher risks of aGVHD in patients with NMDs undergoing URD-HCT. GVH-PIRCHE I and II scores were calculated on the PIRCHE website (https://pirche.com). The endpoints were grade II-IV and grade III-IV (severe) aGVHD. Estimates of aGVHD were calculated using cumulative incidence curves to accommodate competing risks and compared with Gray's test. Death before aGVHD and rejection were the competing events. Multivariable analysis was performed using Fine-Gray competing risk regression. The median age was 9 years (range, 0-51), and the main indications for URD-HCT were inherited BMF syndromes (n=72; 47.7%) and severe aplastic anemia (n=49; 32.4%). All patients received bone marrow as graft source, 96% had in vivo T-cell depletion with ATG, and 83.4% received cyclosporine + methotrexate as GVHD prophylaxis. All patient/URD pairs were 10/10 HLA matched. Among them, 29 (19.2%) were DPB1-matched, while 122 (80.8%) were DPB1-mismatched. Regarding the GvH-PIRCHE I/II scores, patient/URD pairs were stratified into two groups: PIRCHE-absent (score=0) and PIRCHE-present (score>0). Overall, cumulative incidences of grade II-IV aGVHD and severe aGVHD were 8% (95% CI, 4.3%–13%) and 6% (95% CI, 2.9%–10.6%), respectively. The presence of GvH-PIRCHE-I was neither associated with grade II-IV aGVHD (P=0.85) nor severe aGVHD (P=0.39). In contrast, the incidence of grade II-IV aGVHD at 100 days was significantly higher in patients with GvH-PIRCHE-II (11.3%; 95%CI, 6%–18.6%) compared with patients without GvH-PIRCHE-II (1.9%; 95%CI, 0.2%–9.1%) (P=0.038). Remarkably, the cumulative incidence of severe aGVHD was 9.4% (95% CI, 4.6%–16.2%) and 0% (95% CI, 0%–0%) in PIRCHE-II-present and PIRCHE-II-absent groups, respectively (P=0.02). In the Fine-Gray regression, adjusted for confounders, the presence of GvH-PIRCHE-II was the only significant predictor associated with a higher risk of grade II-IV aGVHD (SHR=3.51; 95%CI, 1.07–11.56; P=0.039). In conclusion, this study showed for the first time that indirect T-cell alloreactivity assessed by the PIRCHE predicts aGVHD after URD-HCT for NMDs. Importantly, our data indicate that HLA-DPB1 mismatches without GvH-PIRCHE-II are associated with a lower incidence of acute GVHD and should eventually be prioritized in URD selection. Further studies are warranted to validate our new findings.

UTILIZATION OF RSSO TECHNIQUE FOR RELEASE OF HLA TYPING BY NEXT-GENERATION SEQUENCING (NGS): EXPERIENCE OF THE HISTOCOMPATIBILITY AND CRYOPRESERVATION LABORATORY AT THE STATE UNIVERSITY OF RIO DE JANEIRO (HLA-UERJ)

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Introduction: HLA typing plays a crucial role in determining compatibility between individuals in solid organ transplantation, particularly in Hematopoietic Stem Cell Transplantation (HSCT). HLA incompatibility increases the risk of graft failure, graft-versus-host disease, and ultimately, mortality in HSCT. Errors in HLA typing are critical for transplant outcomes. The methodologies for these tests are continuously evolving with research advancements. Currently, Next-Generation Sequencing (NGS) is widely used in immunogenetics laboratories worldwide, including Brazil. However, despite being a robust technique, NGS often requires a complementary approach to assist in result release due to limitations such as allelic dropout and ambiguities.

Objective: The aim of this study is to analyze the frequency of utilizing the RSSO technique for the release of HLA typing results obtained by NGS from January 2022 to April 2023.

Methods: retrospective data analysis.

Results: During the analyzed period, a total of 20,070 HLA loci were typed by NGS, with 13,908 in 2022 and 6,162 in the first four months of 2023. The RSSO technique was utilized 58 times in 2022 (0.4%) and 50 times in 2023 (0.8%). It was observed that HLA class II loci, particularly HLA-DQB1, exhibited a greater need for complementation for release, with RSSO being used in 30 cases in 2023. There was a growing trend in the utilization of RSSO for the release of HLA typing by NGS, aiming to address uncertainties that were previously unresolved. At HLA-UERJ, in the first four months of 2023, the use of this technique doubled compared to the same period the previous year, improving result reliability and contributing to better clinical decision-making.

Conclusion: The utilization of RSSO technique has proven valuable in assisting the release of HLA typing results obtained by NGS. The results of this study demonstrated a frequent need for complementation with RSSO, especially in HLA class II loci such as HLA-DQB1. The increasing adoption of RSSO reflects the objective of obtaining more reliable results and addressing previously unanswered questions. The combined use of NGS and RSSO offers a comprehensive and robust approach to HLA typing, contributing to the optimization of transplant outcomes and the reduction of risks associated with HLA incompatibility. Future research should continue to explore and refine these complementary strategies to further enhance the practice of immunogenetics and transplant outcomes.

MULTIDISCIPLINARY

DEVELOPMENT OF A NAVIGATION PROGRAM FOR PATIENTS UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION.

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Introduction: Hematological cancer affects about 17,000 people per year, between men and women, in Brazil. Conventional treatment in onco-hematology is usually performed using antineoplastic agents, and when these do not have the desired effect, the patient is referred to Hematopoietic Stem Cell Transplantation (HSCT). When referred to HSCT, the patient will be in a new hospital environment, with new professionals specialized in transplantation and trained to work in a new patient follow-up routine to deal with the new reality of the disease. The therapeutic process is long and complex, and adaptations will be necessary to the new sector, to the new routine and reality, as well as to the new life that will be born after the transplant.

Objective: To describe the implementation of a navigation program (NP) for patients undergoing HSCT in an exclusive unit of the Unified Health System (SUS).

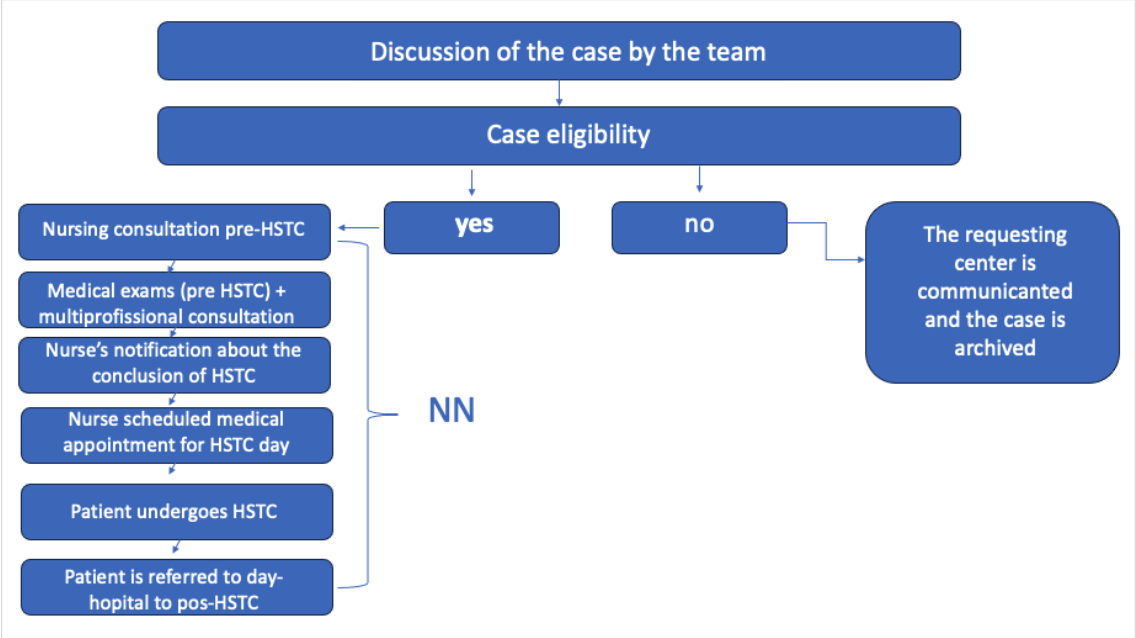
Method: Convergent Care Research (PCA) associated with the PDCA quality and continuous improvement tool. The development of the program was carried out after a pilot project that took place in June, July and August 2022.

Results: 21 patients were navigated. An exclusive channel was also created to establish contact with patients through a cell phone connected to a social network, which sends messages. Around 80 messages were exchanged with the browsed patients, which resulted in a more effective and closer communication with the patients. Seven instruments were built to monitor and educate patients during the implementation of the pilot project, as well as a flowchart of the service showing the performance of the nurse navigator (Figure 1). A satisfaction survey was also carried out, applied to 10 patients, in which a 100% approval rate was obtained for the presence of the navigator nurse in the service. Among the browsed patients, greater adherence to treatment was observed and the mean of the analyzed sample, related to the time elapsed between the first medical consultation and the transplantation, was 99 days. The main reason for the delay in performing HSCT was due to the progression of the disease and the ineligibility of the unrelated donor, which delayed the procedure.

Conclusion: The implementation of a PN facilitates the patient's journey in health services and the replication of the PN for patients undergoing HSCT in the SUS can contribute to a better adaptation to the new sector, greater user satisfaction and improvement in the care provided.

Keywords: Navigation Program. Nurse Navigator. Hematopoietic stem cell transplantation.

FIGURE 1 – Flowchart of the Navigation Program at HSCT Center.



EVALUATION OF THE QUALITY OF LIFE OF CHILDREN AND ADOLESCENTS UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a complex medical procedure, whose basic principle is to destroy the diseased bone marrow and transfer normal progenitor cells to the individual, which can be autologous, syngeneic or allogeneic (related, unrelated or haploidentical). It is used for the treatment of hematological diseases, although other types of malignant and non-malignant diseases can use such therapy. During the entire treatment, patients and their families go through critical stages, where pain and Graft Versus Host Disease (GVHD) are commonly described complications, which can generate negative changes in their quality of life (QoL), with changes in the domain physical, psychological, social and emotional well-being.

Objective: To characterize the QoL of children and adolescents undergoing HSCT.

Method: Applied, non-experimental, cross-sectional quantitative and descriptive study. Forty patients aged between 2 and 18 years who underwent HSCT, undergoing outpatient follow-up, having undergone HSCT between 2016 and 2022, participated in this research. treatment) and the Pediatric Quality Of Life Inventory - Stem Cell Transplant Module (PedsQL-SCTM), a questionnaire that assesses the quality of life of patients undergoing HSCT, where scores close to 100 demonstrate better QoL (the higher the score, the better the QoL) . Data were analyzed using the SPSS program, through descriptive analysis.

Results: 57.5% male patients, with a mean age of 11.28 years, with a prevalent diagnosis (30%) of Myelodysplastic Syndrome (MDS). The prevalent type of HSCT (35%) was Haploidentical Allogeneic, with outpatient follow-up of up to 3 months (25%), with 62.5% presenting with GVHD (40% with acute GVHD, 28% with chronic GVHD and 32% both), with the skin being the main site of involvement (29%). The PedsQL-SCTM scale scores according to each domain and age group demonstrate that the averages presented by patients aged 8 to 18 years are lower when compared to children aged 2 to 7 years (Table 1), except in the domain concern and communication, where this picture is inverted, pointing out that this age group has a greater perception of the presence of changes in their quality of life. The overall average of the questionnaire was 76.65 points, indicating that there are changes in QoL related to the post-HSCT period.

Conclusion: Patients undergoing HSCT have changes in their QoL, and it is essential to carry out its assessment throughout the treatment period, guiding professional practice, in order to favor looking at the individual as a whole, being able to understand the changes in their different domains.

Keywords: Hematopoietic stem cell transplantation. Quality of life. Occupational therapy.

TABLE 1 – Results of scores obtained from the PedsQL – SCTM questionnaire answered by patients and their guardians according to age group and modules

Ages	2 – 4 years	5 – 7 years	8 – 12 years	13 – 18 years
	Average/Standard deviation	Average/Standard deviation	Average/Standard deviation	Average/ Standard deviation
Pain	60,94 (18,22)	62,50 (16,14)	45,83 (29,23)	53,29 (28,21)
Tiredness	68,75 (18,08)	65,71 (16,69)	60,00 (27,57)	57,11 (24,34)
Vomit	95,31 (10,95	85,71 (12,87)	87,50 (13,11)	94,74 (9,61)
Concern	39,06 (10,43)	84,29 (4,26)	74,58 (14,27)	68,64 (18,22)
Nutrition	98,44 (4,42)	99,29 (1,89)	92,50 (10,37)	96,58 (5,79)
Reasoning	87,50 (10,02)	90,18 (7,95)	94,79 (6,14)	82,46 (13,29)
Communication	0,00	54,76 (40,21)	59,72 (20,01)	57,46 (24,98)
Other complaints	96,88 (4,31)	94,05 (6,30)	89,58 (13,88)	86,49 (12,47)

FACTORS ASSOCIATED WITH HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH GVHD

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Graft versus Host Disease (GVHD) is usually accompanied by emotional distress, which can be aggravated by the feeling that the underlying disease has been replaced by another. This study aims to evaluate the quality of life (QoL) of patients with GVHD. We used the concept of the World Health Organization, which defines QL as an individual's personal perception of his or her life. This is a quantitative, descriptive-exploratory, cross-sectional study. The sample was composed of 18 patients (13 men and five women), with hematological malignancies, aged between 20 and 59 years, followed-up in an outpatient clinic of a public teaching hospital in the countryside of São Paulo, Brazil. We used the Short Form Health Survey 36 (SF-36) which evaluates eight components, on a scale of zero (worst QL) to 100 (best QL), namely: Physical Functioning (PF), Role-Physical (RP), Mental Health (MH), vitality (VT), Role-Emotional (RE), Social Functioning (SF), Bodily Pain (BP) and General Health (GH). The application occurred in person at the outpatient follow-ups over a period of six months. The data were analyzed according to the technical recommendations of the questionnaire and submitted to statistical analysis. The results indicated that the most impaired components were: RP (X= 33.3; SD=38.1) and MH (X=50.0; SD=47.3). When comparing the values of each component, it was found that FA had a significantly lower value compared to the others, with the exception of the SM. The other components were preserved, presenting the following values: BP(X=83.0; SD=25.2); SF (X=75.8; SD=25.6); RE (X=71.1; SD=15.2); PF (X=70.8, SD=24.2); VT (X=68.8; SD=12.5), and GH (X=63.6; SD=20.6). Some aspects appear with moderate positive correlation with other components of quality of life: RE and SF (rs = 0.67648, p =0.00205); PF and BP (rs = 0.6702, p = 0.00234), RP and RE (rs = 0.54998, p = 0.01804), RP and VT (rs = 0.5013, p = 0.03406), VT and GH (rs = 0.49737, p = 0.03572 and SF and BP (rs =0.48035, p = 0.04363). These data are important for the understanding of QL as a construct formed by several components, which are self-referenced, dynamic and can interfere with each other. From the results obtained, the RP data stand out, indicating that in the last four weeks the patients had difficulties in performing their daily activities due to physical health, dedicating less time to work, performing fewer tasks than they would like or having more difficulties in performing their activities. It was found that RP influences two other domains of QL of patients (RE and VT), reinforcing the importance of an attention from the multiprofessional team for this component. It is expected that this study will offer a broader understanding of the impact of GVHD on QOL and will help in the planning of psychosocial intervention strategies. Support: Unified Scholarship Program (PUB-USP)

Keywords: Quality of Life, GVHD, Bone Marrow Transplantation

INFORMATION ABOUT BONE MARROW TRANSPLANTATION: PERSPECTIVES OF PATIENTS

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Introduction: Bone marrow transplantation (BMT) is a type of treatment proposed for some diseases that affect blood cells, such as leukemias and lymphomas. The procedure consists of replacing a diseased bone marrow with normal bone marrow cells, with the aim of reconstituting a new healthy marrow. The physician plays a fundamental role in accessing health information and the exchange of information is crucial for improving the outcome of treatments.

Objective: To analyze the perspectives of patients regarding the information received about Bone Marrow Transplantation.

Casuistic and Method: Study participants were patients registered in the Brazilian Association of Lymphoma and Leukemia (Abrale) database. The selection criteria were: having an indication for Bone Marrow Transplantation or having performed the procedure in the last hundred days. This is an observational and descriptive study with data collection through an online questionnaire, self-completed by patients, through the SurveyMonkey platform. Descriptive analyses were performed using the SPSS Statistics software and the results were expressed as percentages. The research project was approved by the Research Ethics Committee of Hospital Israelita Albert Einstein under CAAE 50946021.7.1001.0071.

Results: A total of 208 patients were included in the study, of which 108 had the indication to perform the BMT and 100 performed the procedure in the last hundred days. Of the participants, the mean age was 37.8 years (SD=15.3) and 59.6% were women. Most patients (88%) obtained information about BMT from their physician and more than half (64%) obtained information on the internet, given that not all patients openly discussed everything they needed to know with their physician (13%) and/or understood the information received about the procedure, stating that they would like to receive more information (17%) or that they did not receive the necessary information (2%) from the physician.

Conclusion: The physician is the main source of health information. From the patients' perspective, the information received by the physician about BMT was not enough and the internet was a complementary means of acquiring knowledge. Therefore, it becomes necessary to openly discuss the procedure with the doctor and ask for clarification about what he does not understand, considering that the doctor-patient relationship is based on the exchange of information.

Keywords: Bone Marrow Transplantation. Patients. Access to Information.

MICRONUCLEUS FREQUENCY TEST FOR ORAL CANCER SCREENING IN FANCONI ANEMIA PATIENTS

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Introduction: Patients diagnosed with Fanconi Anemia (FA) are 700 times more likely to develop oral squamous cell carcinoma (SCC) than the general population. Therefore, screening measures and early diagnosis of oral potentially malignant disorders (OPMD) and SCC in this group of patients must be improved. Exfoliative cytology associated with the micronucleus test (MN) as a cellular biomarker can be an alternative since it is associated with chromosomal instability and genotoxicity.

Objective: The aim of this study is to evaluate the relative frequency of micronuclei (FRMN) in oral epithelial cells from patients with FA. Cohort: Forty-six patients with FA who underwent Hematopoietic Stem Cell Transplantation (HSCT) or not with or without OPMD were included in the study.

Methods: Cell smears were collected using the conventional exfoliative cytology technique from the participants' buccal mucosa and bilateral lingual border, in addition to all OPMD identified in the sample. The Feulgen reaction was used to stain the collected cells. FRMN was calculated for every 1000 cells. Chi-square statistical tests of adherence and independence, Wilcoxon, and simple linear regression were applied.

Results: 27 women and 19 men, aged between 4 and 42 years old, participated in the research, 32 of whom had already undergone HSCT. Participants were divided into 3 groups: group 1 of patients with non-transplanted FA without OPMD, group 2 of post-HSCT patients without OPMD, and group 3 of post-HSCT with OPMD. Most participants (28) had FRMN greater than the upper limit considered normal in the general population. The mean total FRMN in patients in groups 1, 2, and 3 were 1.57, 2.16, and 4.49, respectively. Nonetheless, statistical tests did not demonstrate a significant difference in total FRMN between groups. When comparing the FRMN in intact mucosa and the mucosa with OPMD of the participants in group 3, it was possible to identify a statistically significant difference, where patients had greater FRMN in mucous membranes with OPMD. Through simple linear regression, it was identified that the age of the patients (mainly in the age group of 26 to 30 years) and the post-HSCT time of 16 to 20 years influence the increase in FRMN. The findings suggest that the use of the FRMN test can be a valuable complementary method for assessing the predisposition of patients diagnosed with FA to develop oral SCC. Its implementation facilitates early diagnosis, leading to improved prognosis and survival rates.

Keywords: Exfoliative citology, micronucleus test, fanconi anemia, oral cancer

NUTRITIONAL RISK AND RELATIONSHIP WITH ORAL MUCOSITIS IN PATIENTS UNDERGOING ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION: PRELIMINARY DATA

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Introduction: Oral mucositis (OM) is a primary early complication of allogeneic hematopoietic stem cell transplantation (allo-HSCT). This condition is associated with worse clinical outcomes and affects patients and nutritional therapy. Nutritional status is an independent risk factor in the context of allo-HSCT, and the early identification of patients at nutritional risk can contribute to earlier interventions to minimize deleterious effects. The Nutritional Risk Index (NRI)is a recommended tool for this assessment; the low cost, ease of application, and sensitivity to assess patients were included in this study.

Objective: The study intends to identify the nutritional risk of patients submitted to HSCT-alo and its relationship with OM.

Methodology: This longitudinal prospective study included patients aged ≥ 20 years who underwent the first allo-HSCT of both sexes and was approved by the Research Ethics Committee CAAE 56741322.4.0000.5440. The study was divided into two periods: T1 (immediately before the start of conditioning) and T2 (at the moment of the worst degree of MO before neutrophilic attachment), and all variables were collected at both time points. Anthropometric data on weight and height, classification by body mass index (BMI), and serum albumin and C-reactive protein (CRP) levels were collected from electronic medical records. Statistical analysis was performed using the t-test and chi-square test for the variables NRI, CRP, and albumin at a significance level ≤ 0.05.

Results: Twenty patients who underwent allo-HSCT were included, five were female and 15 were male, with a mean age of 38.5 years (+13.4 years), respectively. The most prevalent underlying disease in this sample was Acute Myeloid Leukemia, HSCT-Haploidentical was the most frequent underlying disease. The average weight of T1 was 72.4±16.1 kg and T2 was 71.7±4.2 kg; according to the BMI classification, at T1, 12 (60%) patients had normal weight, 4 (20%) were overweight, 2 (10%) were obese and 2 (10%) were malnourished. At T2, the classification was maintained. All patients showed severe nutritional risk by NRI at both times, with T1 and T2 values of 47.53±3.32 and 46.98±2.96years (p=0.0000), respectively. Albumin presented a value of 3.9±0.4 g/dl at T1 and 3.5 +0.3 g/dl in T2 (p=0.000). CRP was 1.07±1.05 mg/dl at T1 and 4.25±0.4±3.52 mg/dl (p=0.0002). Regarding OM, 8 patients were diagnosed with OM: 50% OM grade I, 25% OM grade II, and 25% OM grade III. CRP and albumin levels were correlated (p=0.00). Nutritional risk and Inflammatory markers did not correlate with OM.

Conclusion: These preliminary data point to the use of more specific tools for assessing nutritional risk, in addition to those obtained by BMI using aggregated biochemical data. In this study, we observed that inflammatory markers correlated with inflammation and oxidative stress observed in conditioning regimens should be considered in future studies.

Keywords: Hematopoietic stem cell transplantation, Nutritional Risk Index, Oral mucositis.

NUTRITIONAL STATUS OF ADULTS WITH CHRONIC GRAFT VERSUS HOST DISEASE AFTER STEM CELL TRANSPLANTATION

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Introduction: Chronic graft versus host disease (GVHD) is a serious complication of allogeneic hematopoietic stem cell transplantation (HSCT), with manifestation in specific organs, or even generalized. Obesity and malnutrition can be considered as risk factors for increased mortality, in addition, problems with eating and malnutrition are complications associated with chronic GVHD. Objective: The study aimed to characterize the nutritional status of patients with chronic GVHD after HSCT.

Casuistry: Included adult patients, post-HSCT with chronic GVHD, in outpatient follow-up.

Methodology: Prospective analytical observational study, carried out from February to May/2023. Age, gender, diagnosis, type of transplant, chronic GVHD classification and location were collected from electronic medical records. Anthropometric data of weight, height, calf circumference, handgrip strength (HGS) and SARC-F questionnaire were collected in nutritional consultation. The Body Mass Index (BMI) carried out the classification of the nutritional status. The presence and degree of malnutrition were classified using the Global Leadership Initiative Instrument on Malnutrition (GLIM). Descriptive analyses were performed with calculation of mean and standard deviation for age, BMI, calf circumference and HGS. Data on clinical diagnosis, nutritional status, transplant characteristics and gender were presented descriptively with absolute and relative frequencies. Student's T-Test ($p<0,05$) was used to compare genders in relation to age and BMI and to compare related and unrelated transplants in terms of eutrophy and overweight.

Results: As a result, we included 30 participants in the study with a mean age of 40.5 ± 11.3. Regarding the type of transplant: related 56.7% (n=17), unrelated 26.7% (n=8), and haploidentical 16.6% (n=5). Considering the BMI, there was a higher prevalence of individuals with overweight 26.7% (n=8) and obesity 36.6% (n=11). No significant difference when comparing females and males in relation to age ($p = 0.38$) and BMI ($p = 0.31$). According to the GLIM, 19 participants did not meet the criteria for malnutrition (63.3%), 1 participant was classified with severe malnutrition (3.3%), 10 participants with moderate malnutrition (33.4%). Two patients with moderate malnutrition were also classified as overweight according to BMI and at risk of sarcopenia according to the SARC-F. There was no significant difference when comparing the types of transplant in relation to Eutrophic ($P=0.11$) and overweight ($p=0.17$).

Conclusion: The nutritional status of patients tends to be overweight, therefore the prevalence of malnutrition and sarcopenia is high, therefore, nutritional monitoring is necessary to help improve the nutritional status and reduce risk factors for patients with chronic GVHD.

Keywords: Hematopoietic Stem Cell Transplantation, Body Mass Index, Nutritional Status, Malnutrition

TABLE 1 – Demographic and clinical characteristics

	Total (mean ± SD)	**Female (mean ± SD)**	**Male (mean ± SD)**	**P value***
Age (years)	40,5 ± 11,3	39,4 ± 9,8	40,9 ± 11,9	0,39
BMI (kg/m^2)	27,05 ± 5,14	26,2 ± 5,7	27,35 ± 5,06	0,31
Calf circumference (cm)	37,11 ± 3,56	36,7 ± 5,18	37,35 ± 2,90	
	Total (nº e %)	Related (nº e %)	Unrelated (nº e %)	Haploidentical (nº e %)
Male	23 (76,7%)	14 (60,9%)	5 (21,7%)	4 (17,4%)
Female	7 (23,3%)	4 (57,1%)	2 (28,6%)	1 (14,3%)
Diagnosis				
SAA	8 (26,7%)	6 (75%)	1 (12,5%)	1 (12,5%)
CML	4 (13,3%)	3 (75%)	1 (25%)	0
AML	10 (33,3%)	7 (70%)	1 (10%)	2 (20%)
Others	8 (26,7%)	2 (25%)	4 (50%)	2 (25%)
BMI classification				
Eutrophy	11 (36,7%)	8 (72,7%)	2 (18,2%)	1 (9,1%)
Overweight	8 (26,6%)	4 (50%)	2 (25%)	2 (25%)
Obesity	11 (36,7%)	6 (54,5%)	3 (27,3%)	2 (18,2%)
GLIM				
No criteria	22 (73,4%)	12 (54,5%)	6 (27,3%)	4 (18,2%)
Moderate malnutrition	7 (23,3%)	6 (85,7%)	0	1 (14,3%)
Severe malnutrition	1 (3,3%)	0	1 (100%)	0

GVHD involvement				
Skin	21 (70%)	13 (61,9%)	5 (23,8%)	3 (14,3%)
Mouth	18 (60%)	11 (61,1%)	4 (22,2%)	3 (16,7%)
GI Tract	5 (16,7%)	3 (60%)	1 (20%)	1 (20%)
Lung	7 (23,3%	5 (71,4%)	1 (14,3%	1 (14,3%)
Liver	2 (6,7%)	1 (50%)	0	1 (50%)
Eyes	10 (33,3%)	6 (60%)	4 (40%)	0
Joints and Fascia	5 (16,7%)	1 (20%)	2 (40%)	2 (40%)
Genital Tract	1 (3,3%)	0	0	1 (100%)
GVHD classification				
Mild	10 (33,3%)	7 (70%)	1 (10%)	2 (20%)
Moderate	15 (50%)	9 (60%)	4 (26,7%)	2 (13,3%)
Severe	5 (16,7%)	2 (40%)	2 (40%)	1 (20%)
Gastrointestinal symptoms				
Yes	11 (36,7%)	8 (72,7%)	1 (9,1%)	2 (18,2%)
No	19 (63,3%)	10 (52,6%)	6 (31,6%)	3 (15,8%)
Change in food intake				
Increase	6 (20%)	6 (100%)	0	0
Decrease	12 (40%)	7 (58,4%)	4 (33,3%)	1 (8,3%)
No change	12 (40%)	5 (41,7%)	3 (25%)	4 (33,3%

SAA: severe aplastic anemia, CML: chronic myeloid leukemia, AML: acute myeloid leukemia, BMI: body mass index, GVHD: Graft versus host disease, GI: gastrointestinal, SD: standard deviation . * Student's T Test for independente samples

PHARMACEUTICAL SERVICES AT HEMATOPOIETIC STEM CELL TRANSPLANT CENTERS IN SOUTHERN BRAZIL

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Introduction: Pharmaceutical Services (SF) are necessary for safety and quality of care in Hematopoietic Stem Cell Transplant Centers (CTCTH), being relevant the characterization and dimensioning of activities.

Objectives: Characterize CTCTH, describe SF, portray multidisciplinary practices, identify critical and improvement points.

Methods: Qualitative descriptive study, ethically approved, carried out in May 2023. Information collected through GoogleForms sent to 11 CTCTH registered with the Brazilian Society of Bone Marrow Transplantation.

Results: There was a response from 7 out of 11 centers (63.6%). Two are public, 2 private, 2 philanthropic and 1 mixed. Paraná has more registered centers (6). All CTCTHs perform autologous and allogeneic transplants, 1 deals exclusively with pediatrics, 4 are High Complexity Centers. Hospital accreditation was certified for 71% of them. The average number of exclusive beds was 16.8 and the number of transplants varied between 36 and 200 per year. The number of pharmacists in the institutions ranged between 11 and 50 and about 16% of these are dedicated to activities in Hematology, in the preparation of chemotherapy. Review of pharmacotherapy is performed on all prescriptions exclusively by specialists. In all cases, it includes evaluation of chemotherapy and infectious prophylaxis. Immunoprophylaxis is also evaluated in 85.7%, in about half of the institutions, it additionally includes verification of sedoanalgesia, infusion pumps and other prophylaxis. There is a record of interventions, with acceptance greater than 50%. The mode calculated for the number of pharmacists in clinical activities was 1 and all have specific training. Three hospitals reported that professionals accumulate functions. Medication reconciliation is carried out upon admission and when switching between hospitalization units, partially or not performed, on 85.7% of occasions. Together with the teams, all centers reported that pharmacists participate in clinical rounds. In more than half of the CTCTH, the pharmacist performs pre-transplant consultations, in 28.5% he participates in the choice of conditioning and in 71.4%, in the selection of immunoprophylaxis. Discharge guidance is carried out in 100% of the CTCTH with provision of information on access to medication. There is post-transplant outpatient follow-up in 57.1% of the sites. The pharmacist develops health education for patients and companions (85.7%), and for professionals in 2 CTCTH.

Conclusion: Most of the CTCTH in the south are located in Paraná. With different funding sources and care features, they meet quality requirements well. Despite the high complexity of the services, specialists in the area represent little of the total number of pharmacists. Clinical performance is limited and professionals can accumulate functions. Complex activities are not performed in full, moderating multidisciplinary routines. Increasing teams can ensure greater quality and completeness of services.

Keywords: Hematopoietic stem cell transplantation. Pharmaceutical services. Bone marrow transplantation

POSTER

ALOGENEIC HSCT

ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION WITH REDUCED INTENSITY CONDITIONING REGIMEN IN A PATIENT WITH LEUKODYSTROPHY RELATED TO MUTATION IN THE CSF1R GENE: A CASE REPORT

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Introduction: CSF1R-related leukodystrophy is a progressive neurodegenerative disease for which there is currently no cure. Median survival is approximately 6 years without intervention. (Lynch et al, 2019) Hematopoietic stem cell transplantation (HSCT) has been proposed as a disease-modifying treatment, with stability of the progression of neurological deterioration. Most reported cases are done with myeloablative conditioning regimens. Given the rapid progression of the disease, the administration of treatment in the beginning of the clinical condition is fundamental. Thus, the benefit of potential stabilization of neurological involvement outweighs the inherent risks of HSCT. (Tipton et al, 2021)

Objective: To report a case of a patient with CSF1R-related leukodystrophy who underwent an allogeneic hematopoietic stem cell transplantation with a reduced-intensity conditioning (RIC) regimen.

Method: Case report - data obtained via clinical records, retrospective, observational.

Results: Patient, male, 43 years old, previously healthy, evolving with extrapyramidal symptoms and parkinsonism, gait impairment, communication alterations (difficulty in the ability to recall words), cognitive and behavioral commitment. After a complementary evaluation with NGS and brain MRI, he was diagnosed in August 2022 with leukoencephalopathy with axonal spheroids and pigmented glia (ALSP) associated with a mutation in the CSF1R gene (in heterozygosis). Patient underwent an HLA identical 10/10 unrelated donor allogeneic transplantation with permissive mismatch in HLA DP and major ABO incompatibility (managed with fresh frozen plasma and pre-transplant plasmapheresis), with cell infusion on March 24, 2023. Reduced intensity conditioning regimen with FluBu2 (fludarabine 30mg/m2 from D-5 to D-2 and busulfan 130mg/m2 from D-5 to D-4), with imunossupression with ATG, methotrexate and tacrolimus. He had neutrophilic and platelet engraftment on D+15. As intra-transplant intercurrences, the patient had mild mucositis, liver alterations secondary to busulfan, hyperactive delirium, acute hemolytic reaction after HSC infusion and febrile neutropenia. As post-BMT complications, the patient had CMV reactivation on D+39, treated with ganciclovir. No evidence of acute or chronic GVHD until the last follow-up. Evaluation of peripheral blood chimerism on D+34 with mixed chimera with 96% allogeneic cells. Currently, patient on D+78 post-transplant, with neurological deficit without evident progression and using tacrolimus.

Conclusion: Allogeneic HSCT in a patient with CSF1R-related leukodystrophy with reduced intensity conditioning regimen is feasible, with few intra and post-transplant complications, with the possibility of disease stabilization and mixed donor chimerism.

Keywords: leukodystrophy, CSF1R, RIC, allogeneic transplantation.

ALOGENIC BONE MARROW TRANSPLANTATION IN ONE-ANTIGEN MISMATCHED UNRELATED DONOR IN ACUTE MYELOID LEUKEMIA – REPORT OF 2 CASES WITH USE OF POST-TRANSPLANT CYCLOPHOSPHAMIDE

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Introduction: The probability of having an HLA-matched sibling donor is only 30% (Lorentino et al, 2018). The chance of finding an HLA-matched unrelated donor has been incresead, with international donor registries, but still can be difficult depending on certain ethnic groups. Among African Americans, the chance of finding a 100% matched donor is 19% and a 7/8 donor increases to 76% according to American databases. (Gragert et al, 2014). Due to the time required to find a suitable donor associated with the urgency for transplantation, alternative donors such as haploidentical donors have been widely used with good survival rates and acceptable toxicities when performed with post-transplant cyclophosphamide (pt-Cy) plataform. (Jorge et al,2018).

Objective: Report the experience of hematopoietic stem cell transplants (HSCT) from unrelated donor and one-antigen mismatch using pt-Cy.

Method: Report of 2 clinical cases - retrospective, observational.

Results: **Patient 1:** male, 38 years old, black, diagnosed with acute myeloid leukemia secondary to Myelodysplastic Syndrome in March/2021. FLT3 ITD and TKD negative, Karyotype: 46, XY, del (9). The patient was treated with "3+7", being refractory, then reinduced with MEC chemotherapy, reaching measurable residual disease (MRD) of 0.5% of blasts. The patient was submitted to a 9x10 unrelated HSCT with minor ABO incompatibility, under conditioning regimen of BuFlu4 AUC 4000 (Fludarabine D-7 to D-3 25 mg/m^2 + Busulfan D-7 to D-4 initial dose of 130 mg/m^2) and post-transplant with pt-Cy 50mg/kg on D+3 and D+4, Tacrolimus from D+5 and mycophenolate from D+5. Engraftment was on D+21 pot HSCT. On D+29 the patient had cytomelovirus (CMV) reactivation, treated with valganciclovir during 4 weeks. On D+30 and D+365 post HSCT, patient was in complete response, MRD-, complete donor chimerism and no GVHD. Immunosuppression was tapered by D+96.

Patient 2: male, 35 years old, black, diagnosed with acute myeloid leukemia in March 2022 with central nervous system, infiltration, normal karyotype. He received treatment with leukocytapheresis, intrathecal chemotherapy, 1 cycle of venetoclax and azacitidine, resulting in negative MRD. Then the patient underwent HLA 9X10 unrelated allogeneic bone marrow transplantation with minor ABO incompatibility, under conditioning with FluBu4 AUC 4500 (Fludarabine 30mg/m2 on D-5a -2 and Busulfan 130mg/m2 on D-5, and according to the AUC of D-4 on D-2) and post-transplant Cyclophosphamide 50mg/kg D+3 and D+4, mycophenolate (D0 to D+35) and Tacrolimus (from D-1 onwards). The patient presented with refractory nausea before d30, treated as mild GvHd of the upper intestinal tract with prednisone, with resolution of symptoms. On D+35 the patient was diagnosed with CMV reactivation, treated with valganciclovir for about 5 weeks. On D+30 post HCTC he had negative MRD and complete donor chimerism.

Conclusions: The experience of Beneficência Portuguesa de São Paulo in unrelated allogeneic transplantation with 1-locus mismatch with Pt-cy is positive, and allows better results than haploidentical transplantation as shown by Battipaglia, 2022.

Keywords: AML, acute myeloid leukemia, allogeneic BMT unrelated to mismatch.

BUILDING A PEDIATRIC HEMATOPOIETIC STEM CELL TRANSPLANT (HSCT) UNIT IN PARAGUAY

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Introduction: An HSCT program can be established at a reduced cost in middle income countries (MICs). Stakeholders involvement and virtuous partnerships both locally and internationally are crucial. Here we analyze which variables and challenges were pivotal to the creation of the center, with a brief focus on patients and a critical review of the methodology.

Methodology: A descriptive analysis of all consecutive patients transplanted since the beginning of the activity in Hospital Ninos de Acosta Nu from October 2019 to September 2022 and of the variables involved in the construction of an HSCT unit.

Results: A total of 14 patients were analyzed. Median total nucleated cells (TNC) and CD34+ infused with bone marrow as source were 3x108/Kg and 3.45x106/Kg, respectively; 2x108/Kg and 7x106/Kg with peripheral blood as source. All patients engrafted with median time of neutrophil > 0,5x109/L and platelets > 20x109/L of 22 and 23 days with bone marrow as source; 19 and 25 days with peripheral blood as source.

5 patients developed grade II-IV acute GVHD (aGVHD) at a median time of 21 days after stem cell infusion. All patients recovered from aGVHD except for 3 who developed multiorgan failure. These last 3 patients were transplanted from haploidentical donors and had developed stage 4 gut aGVHD. Only one patient developed mild chronic GVHD (cGVHD) , which was limited to the oral mucosa, 6 months after HSCT, which resolved with low dose systemic steroids and topic treatment.

Major complications were a severe Dengue infection, diagnosed 61 days after HSCT, resolved; a pure red aplasia, in a ABO incompatible transplant was self-limiting at 6 months; a posterior reversible encephalopathy syndrome (PRES) occurring on day 52 completely recovered; a severe pneumonitis.

Nine patients are alive and disease free at a median follow-up of 14.5 months; 1 patient died of disease progression and 4 of transplant related complications.

The applied capacity building approach was based on specific steps as follow:

- a first exploratory mission in November 2018;
- a 5 days educational course in May 2019;
- creation of a protocol handbook;
- definition of a tree diagram (Jacie model);
- training outside the country for all the key figures;
- training on the job with multiple missions;
- the first allogeneic transplant was performed in October 2019.

Conclusions: The capacity building and twinning program approach have been demonstrated to be efficacious, leading to establishing an HSCT unit in a relatively short time. The local setting in Paraguay led to an early approach to mismatched family donor (MMFD) transplant, which is now considered an acquired procedure. For the startup of the program, alliance with local and international stakeholders, institutions, NGOs and scientific societies was crucial.

CLINICAL AND CYTOGENETIC PROFILE IN PATIENTS WITH MYELODYSPLASTIC SYNDROME TREATED WITH ALLOGENEIC HEMATOPOETIC STEM CELL TRANSPLANTATION IN A SINGLE CENTER IN BRAZIL

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Introduction: Allogeneic hematopoietic stem cell transplantation (aHSCT) is the only option with curative potential for patients with myelodysplastic syndrome (MDS), but due to its morbidity and mortality, is not always a viable option. The clinical and cytogenetic characterization led us to a better understanding of these patients in the context of aHSCT.

Objective: Evaluate the clinical and cytogenetic profile of patients with MDS treated with aHSCT.

Casuistry: We reviewed 34 medical records with primary MDS between 2001 and 2022 in a single center.

Methods: MDS was classified according to WHO 2022 criteria. Cytogenetic analysis was performed by G-banding and fluorescence in situ hybridization. Continuous variables were reported as median and range, and categorical variables as frequency and percentage.

Results: The median age was 41 years, 56% were female. In the classification 15% were MDS with single lineage dysplasia (MDS-SLD), 35% MDS with multi lineage dysplasia (MDS-MLD), 12% with refractory anemia with excess of blasts (RAEB-1), 15% RAEB-2, 23% MDS-hypoplastic. The most frequent cytogenetic profiles were: normal karyotype (29%); trisomy 8 (15%) and monosomy 7 (9%). But also del (17p) (6%), complex karyotype (3%), 23% of other alterations (inv (3q), -Y, del(13q), del(5q), t(2;11), del(11q) and del(20q) and 15% with no available information. The IPSS-R was: very high (6%), high (29%), intermediate (21%), low (18%), and 26% lacked information. Pre aHSCT, 32% used supportive therapies, 29% hypomethylation, 36% immunosuppression and 3% low dose cytarabine. The donor was related in 65%, unrelated in 26%, haploidentical in 6% and 3% syngeneic. The source of stem cells was bone marrow in 88% of cases. The conditioning was Bu4Cy (55%), Bu4Flu (18%), Bu3Flu (15%), CyTBI (3%) and Bu2Flu (9%). ATG was used in 29%. As GVHD prophylaxis, 91% of patients used CI with MTX, 6% used CI with MMF and PtCy, and 3% had no prophylaxis. Of the 34 patients, 22 had acute GVHD and 12 chronic GVHD. Only 5 patients had MDS relapse. Fifteen patients died, 47% due to infection, 27% to GVHD, 13% for disease progression and 13% of other causes. Of the 15 patients who died, 7 died within the first 100 days, 7 died between 100 days and 1 year, and only 1 after 1 year.

Conclusions: In our cohort mortality was related to infection or GVHD, not relapse as shown in literature. Patients who underwent aHSCT before 2011 had the lowest median age, even though, half died in the first year of transplant. Outcomes were better after 2012, because of the change in conditioning intensity, advances in GVHD management and improvement in supportive care. Yet, in the group that transplanted from 2012 to 2022, mortality related to the treatment was still the main problem. Our findings emphasize the need to refine risk stratification and individualize treatment strategy, to improve these results.

Keywords: Myelodysplastic syndrome, allogeneic hematopoietic stem cell transplantation.

		n = 34	2001-2011 (n=15)	2012-2022 (n=19)
Age	Median	41 (19 a 68)	37 (19 a 53)	45 (21 a 68)
Sex	F M	19 (56%) 15 (44%)	8 (53%) 7 (47%)	11 (58%) 8 (42%)
HCT-CI	0 1 2 Unavailable	24 (70%) 4 (12%) 2 (6%) 4 (12%)	12 (80%) 1 (7%) 0 (0%) 2 (13%)	12 (64%) 3 (16%) 2 (10%) 2 (10%)
Classification	MDS-SLD MDS-MLD RAEB-1 RAEB-2 MDS-hypoplastic	5 (15%) 12 (35%) 4 (12%) 5 (15%) 8 (23%)	3 (20%) 3 (20%) 2 (13%) 1 (7%) 6 (40%)	2 (11%) 9 (47%) 2 (11%) 4 (20%) 2 (11%)
Karyotype	Normal Trisomy 8 Del 17p Del 7 Complex Others Unavailable	10 (29%) 5 (15%) 2 (6%) 3 (9%) 1 (3%) 8 (23%) 5 (15%)	6 (40%) 1 (7%) 2 (13%) 3 (20%) 0 (0%) 3 (20%) 0 (0%)	4 (21%) 4 (21%) 0 (0%) 0 (0%) 1 (6%) 5 (26%) 5 (26%)
IPSS R	Low Intermediate High Very high Unavailable	6 (18%) 7 (21%) 10 (29%) 2 (6%) 9 (26%)	3 (20%) 2 (13%) 5 (33%) 1 (7%) 4 (27%)	3 (16%) 5 (26%) 5 (26%) 1 (6%) 5 (26%)
Treatment pre TCTHa	Suport Hypomethylating Imunossupression Low dose cytarabine	11 (32%) 10 (29%) 12 (36%) 1 (3%)	5 (33%) 2 (13%) 7 (47%) 1 (7%)	6 (32%) 8 (42%) 5 (26%) 0 (0%)
Number of transfusions pre TCTHa	<15 >15 No information	14 (41%) 12 (36%) 8 (23%)	7 (47%) 6 (40%) 2 (13%)	7 (36%) 6 (32%) 6 (32%)
Time between diagnosis and TCTHa	< 1 years 1-3 years > 3 years	9 (26%) 16 (48%) 9 (26%)	5 (33%) 6 (40%) 4 (27%)	4 (21%) 10 (53%) 5 (26%)
Donor	Related Unrelated Haploidentical Singenic	22 (65%) 9 (26%) 2 (6%) 1 (3%)	12 (80%) 3 (20%) 0 (0%) 0 (0%)	10 (51%) 6 (32%) 2 (11%) 1 (6%)

Source of CD34	BM PB BM+PB	30 (88%) 3 (9%) 1 (3%)	14 (93%) 0 (0%) 1 (7%)	16 (83%) 3 (17%) 0 (0%)
ATG	Yes No	10 (29%) 24 (71%)	3 (20%) 12 (80%)	7 (36%) 12 (64%)
Conditioning	Bu4Flu Bu4Cy Bu3Flu Bu2Flu CyTBI	6 (18%) 19 (55%) 5 (15%) 3 (9%) 1 (3%)	0 (0%) 14 (93%) 0 (0%) 0 (0%) 1 (7%)	6 (32%) 5 (26%) 5 (26%) 3 (16%) 0 (0%)
GVHD prophylaxis	CSA/FK+MTX PTCy+CSA/FK+MMF None	31 (91%) 2 (6%) 1 (3%)	15 (100%) 0 (0%) 0 (0%)	16 (83%) 2 (11%) 1 (6%)
Relapse/progression	Yes No	5 29	3 12	2 17
GVHD	Acute Chronic	22 12	10 6	12 6
Death		15	8	7
Death – causes	Infecion GVHD Progression Others	7 (47%) 4 (27%) 2 (13%) 2 (13%)	2 (25%) 3 (38%) 2 (25%) 1 (12%)	5 (72%) 1 (14%) 0 (0%) 1 (14%)
Death – time	< 100 days 100 days – 1 year >1 year	7 7 1	3 4 1	4 3 0

CLINICAL AND LABORATORY CHARACTERISTICS OF CYTOMEGALOVIRUS INFECTIONS IN PATIENTS OF A UNIT OF THE BRAZILIAN PUBLIC HEALTH SYSTEM UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION USING HAPLOIDENTICAL DONOR

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Introduction: Cytomegalovirus (CMV) is the main viral etiologic agent in patients undergoing allogeneic hematopoietic stem cell transplantation (HCT). In the great majority of the cases, CMV reactivation occurs in IgG+ receptors, especially in high-risk ones, such as patients with haploidentical donors who use Cyclophosphamide (CY-post) post-transplant. If not treated early, they can produce high morbidity and mortality. For this reason, prophylactic strategies are adopted with the use of Letermovir or preemptive strategies with the use of Ganciclovir, Valganciclovir or Foscarnet. However, only Ganciclovir is available in the Brazilian Public Health System (SUS) for HCT patients.

Objective: Presenting the clinical and laboratory characteristics of CMV infections in patients undergoing haploidentical HCT in a Unit of the SUS.

METHODS: Retrospective analysis of adults' patients from February to December/2022. All patients received graft-versus-host disease (GVHD)/graft failure prophylaxis with CY-post, Mycophenolate mofetil and Ciclosporin/Tacrolimus. CMV detection was performed using the qPCR technique at the cobas-CMV platform (Roche®). Values ≥ 500 IU/mL were considered positive, the tests were performed twice a week.

Results: Twenty-two haploidentical transplants were performed, ages ranging from 20-68 years (median of 37 years), 13 female and 9 male. Patients were diagnosed with Acute Myeloid Leukemia (n=11), Acute Lymphoid Leukemia (n=5), Hodgkin Lymphoma (n=3), Myeloproliferative Neoplasms/Chronic Myeloid Leukemia (n=2) and Non-Hodgkin Lymphoma (n=1). Most patients were in first or second complete remission (n=17). Pre-HCT serological status was Donor+/Recipient+ (n=17/77%), Donor+/Recipient- (n=1/4.5%), Donor-/Recipient+ (n=3/14%) and Donor-/Recipient- (n=1/4.5%). Four patients died within the first 100 days after HCT, due to causes unrelated to relapse or CMV infection; thus, 18 patients were evaluated. Among those patients, 15/18 (83%) reactivated CMV in a median of 32 days (ranging from 0-64 days), 6/15 (40%) were using corticosteroids at the time of reactivation, and 3/15 (20%) were being treated for GVHD. All patients used Ganciclovir at the initial standard dose of 5 mg/Kg 12/12h. The median treatment time to qPCR negative was 21 days (ranging from 4-33 days), 6/15 (40%) patients had other reactivations requiring new cycles of treatment and no patient developed CMV disease. The overall survival was 90.9% in the first year post-HCT.

Conclusion: As demonstrated in several studies, the preemptive strategy with the use of Ganciclovir is not the most appropriate, because of the prolonged treatment time, and many patients have more than one reactivation, which increases the toxicity of the treatment. Thus, the ideal strategy is to carry out prophylaxis with Letermovir, and direct the efforts of regulatory agencies towards enabling access for SUS patients.

Keywords: Cytomegalovirus, Infection, Ganciclovir, Letermovir, Haploidentical Hematopoietic stem cell transplantation

INCIDENCE AND SEVERITY OF CYTOKINE RELEASE SYNDROME IN HAPLOIDENTICAL ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANT WITH EARLY INITIATION OF IMMUNOSSUPRESSIVE THERAPY FOR PROPHYLAXIS OF GRAFT VERSUS HOST DISEASE

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Introduction: The use of haploidentical donors in allogeneic hematopoietic stem cell transplant (HCST) is increasingly growing, due to the efficacy of post Cyclophosphamide (PTCy) in reducing the incidence of graft versus host disease (GVHD). Cytokine Release Syndrome (CRS) occurs In up to 90% of cases after infusion of the graft, and it manifests as fever and constitutional symptoms. Most cases are mild (CRS grade 1-2), but up to 17% can evolve to severe cases (CRS grade 3-5), with life threatening end organ damage. Severe CRS is associated with increased treatment related mortality (TRM). GVHD prophylaxis usually includes PTCy on D+3 and D+4, and initiation of immunossupression (mycophenolate mofetil [MMF] and calcineurin inhibitor [CNI]) on D+5. It's been recently demonstrated that early initiation of immunossupression is associated with reduced incidence of CRS and better outcomes (Hunter et al, 2022).

Objective: To evaluate the incidence and severity of CRS (graded accordingly to CTCAE 5.0) after the implementation of protocol of early initiation of immunossupression for GVHD prophylaxis, with start of CNI on D-1 and MMF on D0, and infusion of PTCy on D+3 and D+4.

Methods: Retrospective analysis of a cohort of patients who underwent haploidentical HSCT, with early initiation of imunnosupression for GVHD prophylaxis, in Hospital A Beneficiência Portuguesa de São Paulo, between february and may 2023, and descriptive analysis of outcomes.

Results: Twelve cases were analysed, including 10 cases with peripheral blood stem cell source (83.3%) and two with bone marrow source. Median age was 49.08 years. AML/ MDS was the main transplant indication. 9 patients used tacrolimus and 3 patients used cyclosporine as CNI. CRS incidence was 58,3% (7 cases), all classified as mild events, with just one case of CRS grade 2, which presented with fluid responsive hypotension and transitory use of low flow oxygen, for less than 24 hours. There was no Intensive Care Unit transfer during the period, and there have been no deaths in the cohort up to this moment. In two patients classified as having CRS, blood cultures collected in the occasion of the first fever episode identified gram negative bacteria. From the nine cases which had already been hospital discharged on the moment of our analysis, median days for neutrophilic engraftment was 16 days, and 18 days for platelet engraftment.

Conclusions: The incidence of CRS in our cohort was smaller when compared to literature data, without the occurrence of severe cases. Those patients remain on follow up, for posterior analysis of outcomes of treatment related mortality, survival free of acute and chronic GVHD, overall survival, and relapse free survival.

Keywords: Haploidentical. Prophylaxis. GVHD. Cytokine Release Syndrome.

LINEAGE SWITCH INDUCED BY BLINATUMOMAB AFTER ALLOGENEIC BONE MARROW TRANSPLANTATION - CASE REPORT

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1 Hemomed Instituc
2 Sollutio Laboratory

Introduction: Lineage switch is a rare phenomenon, especially in adults, in which Acute Lymphoblastic Leukemia (ALL) transforms into Acute Myeloid Leukemia (AML) and vice versa. Recent reports have shown a relationship between the use of blinatumomab and lineage switch, with an uncertain mechanism.

Objective: In this study, we describe a clinical case of lineage switch induced by Blinatumomab, followed at IBCC Oncology Hospital - São Camilo.

Case Description (Results): A 42-year-old patient diagnosed with Philadelphia-positive B lineage ALL in May 2021. Treated with HyperCVAD chemotherapy protocol associated with dasatinib and referred for Hematopoietic Stem Cell Transplantation (HSCT), achieving complete response with negative Minimal Residual Disease (MRD). Allogeneic haploidentical HSCT was performed in October 2021 without significant complications. Medullary reassessment after 90 days showed positive MRD (0.2% lymphoid blasts), leading to withdrawal of immunosuppression and reintroduction of dasatinib. After 1 month, the patient still had a percentage of abnormal cells. Treatment with blinatumomab was initiated, resulting in negative MRD after the first cycle of medication. After the third cycle, the patient presented significant monocytosis in the bone marrow and progressive cytopenias. A myeloid mutation panel was performed, revealing the presence of KMT2A-MLLT4 mutation, leading to a diagnosis of Acute Myeloid Leukemia. The patient was treated with venetoclax in combination with azacitidine but showed refractoriness to treatment and subsequently died due to septic shock.

Discussion: We described a case of Philadelphia-positive B lineage ALL with early relapse after allogeneic bone marrow transplantation, initially responding to treatment with blinatumomab but rapidly switching to AML. Although a clonal relationship between the neoplasms is likely, it could not be confirmed due to the lack of NGS testing at diagnosis. The complete disappearance of B lineage lymphoid blasts indicates the effectiveness of blinatumomab in treating relapsed ALL-B. However, the fact that AML blasts did not express CD19 highlights the escape from the anti-CD19 effect of blinatumomab. The present report represents a very rare event, especially in the post-HSCT context, but it is frequently associated in the literature with the KMT2A mutation. This condition presents a challenging diagnosis and treatment, associated with a high mortality rate. Further elucidation of the mechanisms related to the nuclear reprogramming process involved in lineage switching and its possible relationship with blinatumomab treatment is necessary. The publication of more cases is required due to the rarity of the presented clinical condition.

Keywords: Blinatumomab, ALL, HSCT, Relapse, Lineage switch.

FIGURE 1. **Immunophenotyping charts at patient's diagnosis**

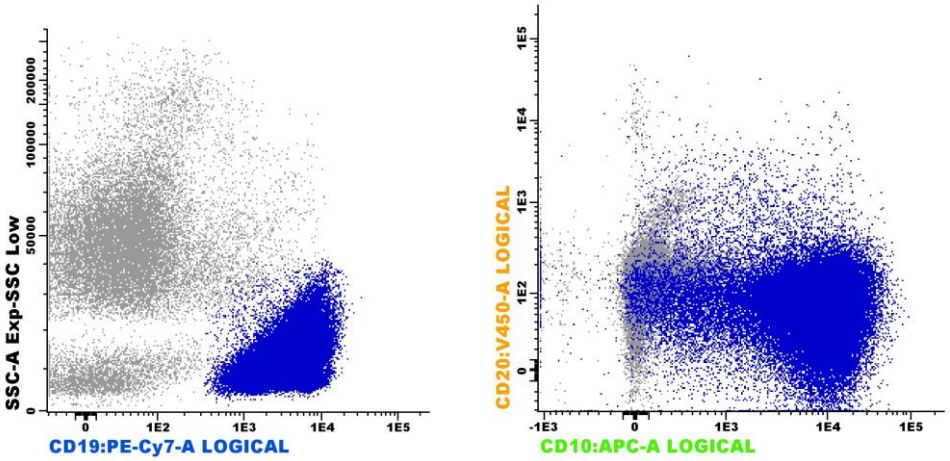
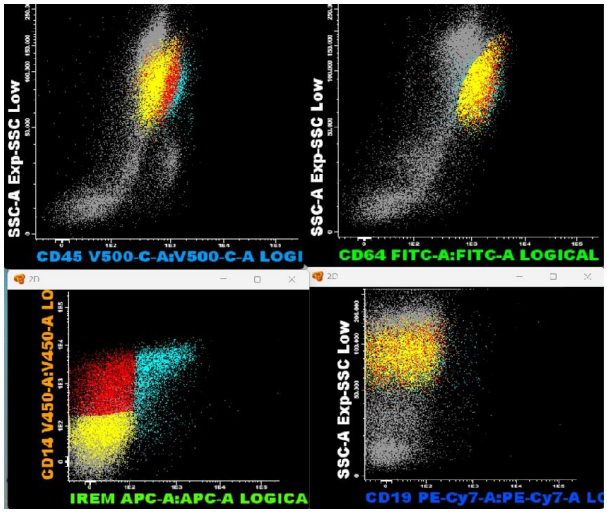


FIGURE 2. **Immunophenotyping charts during patient's lineage switch**



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MIXED PHENOTYPE LEUKEMIA ASSOCIATED WITH HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS: A CASE REPORT

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Introduction: Acute mixed phenotype leukemia is a rare and aggressive disease. The literature indicates that after disease remission, consolidation treatment with Allogeneic Bone Marrow Transplantation (alloSCT) is necessary. The objective of this study is to describe a clinical case of a patient with mixed phenotype leukemia associated with Hemophagocytic Lymphohistiocytosis, followed at a Hematology and Bone Marrow Transplantation Service of the Hemomed Institute.

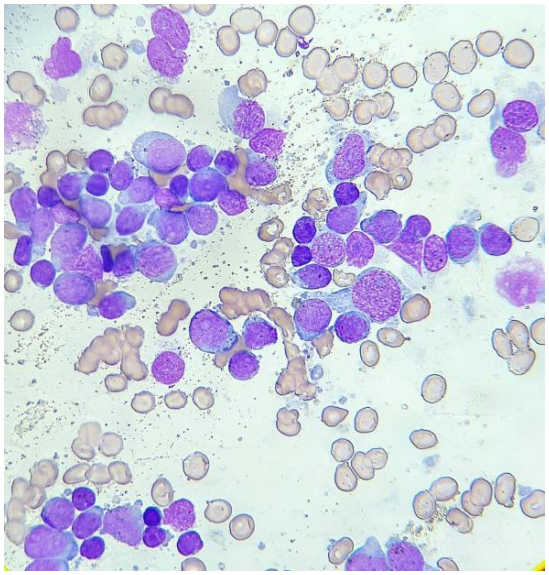
Case Report: A 22-year-old male patient was diagnosed with Acute Mixed Phenotype Leukemia (B/Myeloid) associated with Hemophagocytic Lymphohistiocytosis (HLH) during an ongoing infectious episode caused by Epstein-Barr Virus (EBV) and Pulmonary Tuberculosis (TB). At diagnosis, the patient presented with 2 populations of blasts (Figure 1): myeloid 79.1% and B lymphoid 13.8%, along with a karyotype of 46XY add(2)(q37) [14], no evidence of MLL and BCR-ABL1 rearrangements or deletions, no evidence of central nervous system infiltration, and retinography performed due to visual impairment, showing Roth spots (Figure 2). The patient developed severe acute hepatites and a serum EBV PCR positivity. Despite receiving treatment for thrombophlebitis and bacterial pneumonia, in addition to pulmonary tuberculosis, the patient continued to have fever and met diagnostic criteria for Hemophagocytic Lymphohistiocytosis secondary to malignancy (M-HLH). The patient underwent induction treatment for mixed phenotype leukemia with a hybrid protocol, using FLAG-IDA-vincristine-prednisone adapted, along with HLH treatment using Etoposide and weekly Human Immunoglobulin, treatment for EBV infection included Rituximab, and the treatment for tuberculosis. After 28 days of initial treatment, the patient showed complete reversal of the febrile syndrome, hepatic abnormalities, and negative serum PCR for EBV and revealed remission with negative minimal residual disease (MRD) by immunophenotyping.The patient underwent haploidentical alloSCT transplantation, with myeloablative conditioning using Fludarabine and total body irradiation (Flu-TBI) at 12Gy, from a female donor with a previous pregnancy, using peripheral blood stem cells with an infusion of 7.2 × 10^6 CD34+ cells/kg, and graft-versus-host disease (GVHD) prophylaxis with Cyclophosphamide, Cyclosporine, and Mycophenolate. The patient achieved neutrophil and platelet engraftment on D+13 and D+14. On D+24, the patient manifested acute skin and gastrointestinal GVHD MAGIC II/IB-MTR-C refractory to corticosteroid therapy at 1mg/kg, and received second-line treatment with Ruxolitinib.Currently, on D+180, the patient has complete chimerism, disease in remission, controlled GVHD.

Discussion: This is a description of a clinical case of a patient with mixed leukemia, demonstrating two populations of blasts by immunophenotyping: myeloid with aberrant B marker (CD79a) and T marker (CD7), and B lymphoid with aberrant myeloid marker (CD33). The complication of M-HLH was triggered by the underlying disease, as well as the infectious episode caused by EBV and TB.

Conclusion: It is challenging to manage the treatment of mixed phenotype leukemia, especially when associated with M-HLH, as there is limited prospective data in the literature defining the best therapeutic approach.

Keywords: Mixed phenotype leukemia, secondary Hemophagocytic Lymphohistiocytosis, allogeneic bone marrow transplantation.

FIGURE 1: Representation of two populations of blasts. A) Myelogram; B) Immunophenotyping. Source: Flow Cytometry Laboratory - TechLife/Hemomed.myelogram



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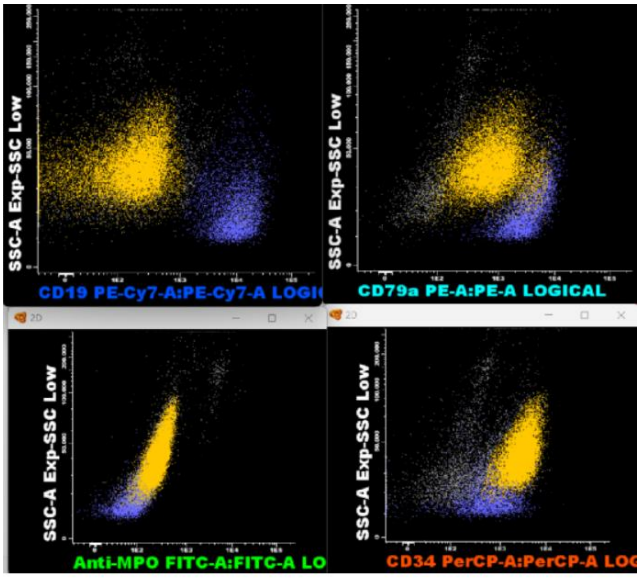

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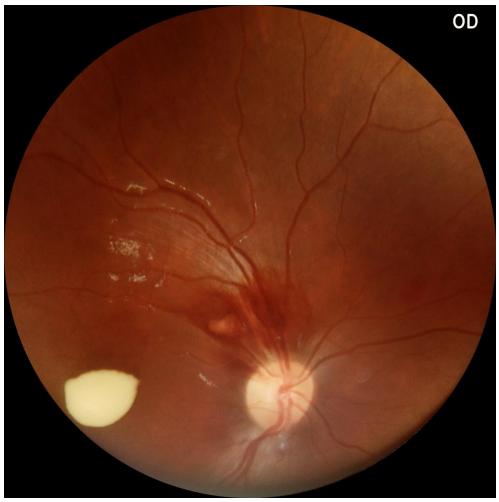
FIGURE 2: Retinography: Roth Spots. Source: Images captured by the ophthalmology team of Dr. Sylvia Regina Nakashima Benevicius.



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MYELODYSPLASTIC SYNDROME PATIENT'S JOURNEY TO ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION: SURVEY OF THE LATIN AMERICAN REGISTRY

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Background: Although Hematopoietic Stem Cell Transplantation (HSCT) is the only curative therapy for Myelodysplastic Syndrome (MDS) patients, several aspects may contraindicate the procedure. The study aimed to understand the journey of MDS patients referred to HSCT centers of Latin America and key points in this process.

Methods: A questionnaire was directed to members of the Latin America Registry for Myelodysplastic Syndrome.

Results: A total of 18 adult and pediatric centers answered the questionnaire. Most centers attended less than 5 patients and less than 30% used geriatric scores in the HSCT decision. Transfusion dependence was reported by 89.2% of the centers, and alloimmunization in 22.3%. Data from 162 patients were entered. Contraindication rate was 14.2% (n=23), with comorbidities and disease refractoriness being the main causes. There was a predominance of high-risk R-IPSS stratification. About 25% of patients were referred for transplantation without R-IPSS score (Table 1). The study constitutes a useful tool for comprehend the HSCT frame in Latin America as it reflects issues like access to not only to HSCT but also to medical service for a diagnosis of MDS and the need of a deeper consideration aiming to improve the quality of HSCT.

Keywords: Myelodysplastic Syndrome. Hematopoietic Stem Cell Transplantation. Journey.

TABLE 1: Main Responses of the Survey

DATA	%
Questions about the centers (n=18)	
Number of patients attended at pre-HSCT service in the last 24 months.	
Less than 5	38,9% (7)
Between 5 and 10	27,8% (5)
Between 11 and 20	22,3% (4)
More than 20	11,1% (2)
Use of any geriatric scores for HSCT decision	
Yes	27,8% (5)
No	72,2%(13)
Alloimunization	22,3% (4)
Transfusion Dependence	89,2% (14)
Patient's features (n=162)	
Age (years)	
2-18	5.60% (9)
10-18	9.60% (15)
19-30	7.60% (12)
31-50	24.40%(40)
51-70	45.60% (74)
71-80	7.20% (12)
Karyotype	
Yes	83.3%
No	16.7%

IPSS-R stratification	
Very Low/Low	13.40% (15)
Intermediate	26%(31)
High/Very high	61% (73)
Without Stratification	26.50% (43)
Indication to HSCT	
Indicated	85.80% (139)
Contraindicated	14.20% (23)
Patients indicated but that could not be transplanted	16.5% (23)
Causes	
Absence of compatible donor only	30.4%
Disease Progression only	69.6%
Worsen for any reason	30.4%
Lack of beds	43.5%
Refuse of patient	30.4%
More than one reason	39.1%
Comorbidities	
Yes	50%
No	50%
Types of Comorbidities	
Cardiac	45.4%
Pulmonary	36.3%
Hepatic	100%
Infectious	54.5%
Renal	27.3%

YOUNG ADULT WITH FANCONI ANEMIA SUBMITTED TO MISMATCHED UNRELATED ALLOGENEIC STEM CELL TRANSPLANTATION, WHAT TO EXPECT

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Introduction: Fanconi Anemia is a rare genetic disease caused by the biallelic inactivating mutations in 1 of the 23 genes of the FA/BRCA DNA pathway and it is characterized by bone marrow insufficiency, genetic disorders and to neoplastic predisposition (myelodysplastic syndrome - MDS, acute myeloid leukemia - AML and solid tumours such as squamous cell specially) which increases with age. Due to the genetic DNA difficulty repair between bridges, there is a genetic instability which increases the susceptibility to toxic components such as proinflammatory and alkylating agents.

Case Report: Male, 32 years old with Fanconi Anemia, develops bone marrow insufficiency and myelodysplastic syndrome with necessity of treatment only in the middle of 2022. Initialized Azacitidine (total of 7 cicles with dose adjustment due to bone marrow toxicity) and referred to an international mismatched unrelated bone marrow transplantation (9x10 with HLA-A mismatch and HCT-CI of low risk). Admission exams showed blasts in the peripheral blood which leaded to the diagnosis of acute myeloid leukemia and necessity of treatment. We decided to delay the transplant and initiate induction protocol with mini-FLAG (19/02/2023 to 06/03/2023). Secondary to the prolonged hospitalization and chemotherapy, the patient developed several infections complications, but with no need of intensive unit care use. After clinical improvement and reduction of the blasts number, initiated non myeloablative conditioning regimen (Alemtuzumab, Fludarabin, TBI 200cGy and graft versus host disease -GVHD- prophylaxis with post-transplant Cyclophosphamide, cyclosporine and mycophenolate) and infusion of the hematopoietic stem cells (2,10 x 108 mononuclear cells) in 15/03/2023 with marrow graft at D+18. After a while, persists with good health conditions but with pancytopenia and transfusion support despite the engrafting. At D+84 in medullar evaluation, presents loss of chimerism (27%) and due to the elevation of the blasts number in the bone marrow, it was decided to restart Azacitidine and perform a second transplant, an haploidentical with the patient's mother; since there is no other possible donor at the registry.

Conclusion: During the conditioning period, non myeloablative protocols are considered superior to others ablative regimens, besides the need of dose adjustment with some chemo agents that has the potential of aplasia (Ex.: alkylating agents such as cyclophosphamide) and the association with immunotherapy that reduces the incidence of GVHD. In the other hand, some authors consider doing precocious HSCT in patient's with Fanconi Anemia with clonal evolution to MDS/AML, because it is considered a way of cure and avoids higher doses of chemotherapy that can cause worse outcomes.

Keywords: Fanconi Anemia. Haploidentical transplant, Acute Myeloid Leukemia.

POOR GRAFT FUNCTION AFTER COVID-19 INFECTION IN HAPLOIDENTICAL STEM CELL TRANSPLANTATION

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Introduction: Although the main manifestation of the SARS-CoV-2 infection are in the airways, the involvement of the hematopoietic system has been reported. The most frequent disorders are lymphopenia, thrombocytopenia, and anemia. Reports of poor graft function in the context of COVID-19 after bone marrow transplantation (BMT) have not been published to date.

Objective: To report a case of a patient who underwent successful haploidentical BMT followed by poor graft function due to COVID-19 infection and to perform literature review.

Case report: A 66 years old female, previously treated with radiotherapy for ductal carcinoma in situ, was diagnosed with high-risk acute myeloid leukemia. She received 6 cycles of azacitidine 75mg/m^2 and venetoclax 400mg and achieved complete response with negative measurable residual disease (MRD). She underwent a haploidentical BMT from her 44-years-old son. The HLA antibodies were negative. The conditioning regimen was FluCyTBI 4 Gy and 4,15x10e6 CD34 cells/kg from isogroup peripheral blood were infused. GVHD prophylaxis with cyclophosphamide, cyclosporine and mycophenolate was made. She presented neutrophilic engraftment on D+22 and platelet engraftment on D+36. A bone marrow (BM) study on D+30 showed hypercellularity in neutrophilic sector, normocellular megakaryocytic series; negative MRD and chimerism of 100%. She received cyclosporine until D+50, which was suspended due to renal dysfunction. From then on, she received corticosteroids until D+170. She did not present GVHD or CMV reactivation. On D+50, the patient was hospitalized due to SARS-CoV-2 infection without the need for ventilatory support and received remdesivir for 3 days. At admission, Hb 7.6g/dL, neutrophils 19,240/mm^3 and platelets 88,000/mm^3 were found. After 14 days of hospitalization, she presented persistent thrombocytopenia 19,000/mm^3 and anemia Hb 7.8g/dL, with high transfusion demand since then. On D+131 a new BM study was performed with dysplastic changes in the erythrocytic and megakaryocytic series and hypocellularity in the megakaryocytic series; the MRD was negative and chimerism of 100%. Folid acid, vitamin B12, parvovirus B19 serologies were normal and BM PCR for CMV, EBV and HHV-6 were indetectable. SARS-CoV-2 viremia is rare and in this case, it was not possible to identify the virus in the BM sample. Erythropoietin and eltrombopag 150mg/day was started. Now, the patient is on D+225 with an improvement of anemia but maintenance of thrombocytopenia (11,000/mm^3).

We performed a literature review and searched for cases of poor graft function or aplastic anemia after the SARS-CoV-2 infection reported between 2020 and 2023. We found 11 cases of COVID-19 infection preceding aplastic anemia. No poor graft function was reported.

Conclusion: To our knowledge, the present case report is the first case of poor graft function with COVID-19 as a possible trigger. The role of antiviral therapy in preventing this complication is not known.

Keywords: Poor graft function. Allogeneic transplantation. Haploidentical transplantation. COVID-19.

PROPOSAL FOR PRE-TRANSPLANT CONDITIONING OF HEMATOPOIETIC STEM CELLS WITH A HAPLIDENTICAL DONOR FOR MEGAKARYOBLASTIC LEUKEMIA RECURRENCE IN A PATIENT WITH DOWN SYNDROME

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Introduction: Children with Down syndrome (DS) are at high risk for developing acute leukemias. Despite the high overall survival rate with first-line chemotherapy treatments, a proportion of children relapse, and little is known about the biomolecular mechanisms involved.

In these cases, the prognosis is poor and there is still no consensus regarding the treatment, sometimes hematopoietic stem cell transplantation (HSCT) is indicated.

Historically, patients with DS have a high mortality rate due to toxicity in myeloablative conditioning (MAC) protocols and, on the other hand, a high risk of relapse with the use of reduced intensity conditioning (RIC). However, preliminary evidence indicates that a regimen that adds low doses of total body irradiation (TBI) to RIC conditioning may reduce the risk of relapse in these patients.

Objective: To report a trial case at a pediatric HSCT service using low dose TBI associated with a RIC regimen in a patient with relapsed leukemia and Down syndrome.

Method: Case report through the analysis of the patient's chart

Results: Male patient, 3 years old, with DS, diagnosed with AML M7 in March 2021, being treated according to the BFM LMA 2004 protocol with good response. In February 2022 he had an isolated spinal cord relapse and was referred to HSCT. In the evaluation prior to this, thrombocytopenia was observed and a second isolated medullary relapse was also identified. He was reinduced with the MAG protocol in November 2022 with HSCT in morphological remission and positive DRM 1% in December 2022.

Haploidentical related donor available, 39 years old, male, HLA 6/12. Aiming at lower toxicity in addition to reducing the risk of relapse, a regimen with Fludarabine 150 mg/m^2 D-7 to D-3, Melphalan 75 mg/m^2 D-2 and TBI 400 cGy D-1 and GVHD/rejection prophylaxis with Cyclophosphamide 50 mg/kg/day on D+3 and D+4 and Ciclosporin + MMF + Filgrastim from D+5 onwards.

The patient had neutrophilic engraftment on D+13 and platelet engraftment on D+19. He had no serious toxicities, having been treated only for herpes virus 6 reactivation with Ganciclovir for 14 days. Acute Grade 2 GVHD was observed on the skin but it was responsive to corticosteroid use with good tolerance to weaning and withdrawal.

The patient is alive, with no evidence of active disease, and in good general health.

Conclusions: The protocol used by the service with the addition of a low dose of TBI to the RIC scheme can, therefore, be of great collaboration for treatment with rescue with HSCT in other patients within the same clinical context.

Keywords: Leukemia. Child. Down's syndrome. Stem cell transplantation. Haploidentical. Megakaryoblastic.

RISK OF PRE TRANSPLANT HLA MISTYPING IN PATIENTS WITH MALIGNANT DISEASES

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Introduction: HLA loss of heterozygosity (LOH) is a well-known mechanism of immune response evasion from malignant diseases by reducing presentation of neoantigens to alloreactive CD8 T-cells. Two mechanisms are described: copy neutral LOH which leads to loss of complete or partial HLA haplotype or point mutations in DNA that affect structure and expression of HLA molecules.

Objective: We reported four cases of HLA- LOH in pre transplant blood samples from patients in the acute phase of hematological malignancies.

Methods: We typed peripheral blood and buccal swab (as confirmatory typing) by Next-Generation Sequencing (NGS) using AlloSeq Tx17 kit (CareDx) and genotypes were assigned with AlloSeq Assign software v.1.0.3 (CareDx).

Results: Patient 1: A 30-year-old male patient with acute myeloid leukemia presented the HLA-homozygous: HLA-A*25:01, -B*18:01, -DRB1*15:01, -DQB1*06:02 and -DPB1*04:02, except for the HLA-C locus in which it was not possible to define a genotype. There was an allelic imbalance suggesting HLA loss. Upon retyping with his buccal swab, a balanced heterozygous typing was obtained for all loci (HLA-A*11:01, -25:01; -B*18:01,-44:02; -C*05:01, -12:03; -DRB1*11:01, -15:01; -DQB1*03:01, -06:02; -DPB1*04:01, -04:02. Patient 2: A 60-year-old female patient with acute lymphoblastic leukemia had a marked imbalance on HLA alleles suggesting a transition towards a homozygous genotype. LOH was confirmed through re-typing with new blood sample collected during the patient's remission phase. Patient 3: A 44-year-old patient with myelodysplastic syndrome presented an HLA-B*07:425N in peripheral blood typing due to a single nucleotide exchange (C>T) in codon -19 (CGA>TGA) resulting a premature stop codon in exon-1, not confirmed with buccal swab sample that revealed the common HLA-B*07:02. Patient 4: A 62-year-old patient with adult T-cell leukemia/lymphoma showed a single nucleotide exchange (C>T) in codon 54.1 (CAG>TAG) of exon 2, which resulted in HLA-A*02:NEW with a stop codon in the new position. However, analysis of his sons' typing suggested that the inherited haplotype should have the common HLA-A*02:01. Retyping with buccal swab confirmed HLA-A*02:01.

Conclusion: Choosing the right sample is crucial for test accuracy. The first two patients illustrate why all homozygosity in hematological patients must be verified with familial analysis, germ line samples or new sample from the patient in remission. The last two patients had null alleles generated by somatic mutation in HLA region of blast cell, which highlights the importance of any unusual typing or null alleles on bone marrow recipients be confirmed with buccal swab sample. In hematopoietic cell transplantation setting, HLA-LOH can lead to HLA mistyping in patient's pre-transplant workflow and selection of an inappropriate bone marrow donor with an increased risk of Graft Versus Host Disease.

AUTOLOGOUS HSCT

BENEFIT OF IMPLEMENTING A NEW SERVICE OF AUTOLOGOUS HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT) IN THE TREATMENT OF PATIENTS WITH MULTIPLE MYELOMA IN A TERTIARY PUBLIC HOSPITAL

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Introduction: Multiple Myeloma (MM) is a monoclonal gammopathy and accounts for 10% of all hematologic malignancies. The use of chemotherapy with alkylating agents and corticosteroids was the only option for the treatment of this disease for a long time. In recent decades, high-dose melphalan therapy followed by autologous Hematopoietic Stem Cell Transplantation (HSCT) has shown improved progression-free survival. HSCT has been defined as standard therapy after initial induction therapy for eligible patients. Autologous HSCT at Hospital Nossa Senhora da Conceição (HNSC), in Porto Alegre/RS, began to be performed in December 2021 in patients with multiple myeloma. Since the HNSC did not have its own transplant service and the patients were referred to other institutions, we compared the results of patients who were referred to undergo HSCT in other hospitals with those patients who was transplanted at HNSC .

Method: The study was a retrospective cohort, with the allocation of patients with multiple myeloma treated at Hospital Nossa Senhora da Conceição (HNSC) in Porto Alegre/RS who were referred for HSCT at the Hospital de Clínicas de Porto Alegre (HCPA), Santa Casa da Misericórdia in Porto Alegre (SC) compared with patients who transplanted at HNSC, in the years 2017, 2018, 2019 and 2022. Clinical characteristics such as age, gender, performance status (ECOG), and outcomes such as the time between diagnosis and the performance of HSCT (in months), the time for grafting (in days) were analyzed. Data were coded and analyzed using the Statistical Package for Social Sciences (SPSS) version 20 software.

Results: 26 patients were included in the sample. 7 patients (26.9%) underwent HSCT at HCPA, 10 (38.5%) at SC and 9 (34.4%) at HNSC. 16 (61.5%) were male. . 18 patients had ECOG from 0 to 2 and 8 had ECOG 3 at moment od diagnosis. The main outcome of the study was the waiting time from diagnosis to treatment and it shows that the waiting time of patients who underwent HSCT in their own service (HNSC) was shorter, 10 months on average compared with 18 and 19 months in group of patientes that were transplanted at HCPA and SC, respectively with statistical significance (p 0.47). The grafting time of patients who transplanted at HNSC had of 10.3 days, while at HCPA it was 14.7 days and at SC it was 13.5 days, an average.

Discussion and conclusion: Patients who underwent HSCT at HNSC had a shorter waiting time to transplant than other patients who transplanted in other centers. This data shows the importance of the transplant service in a tertiary public hospital that is a reference for the treatment of hematological diseases. Thus, it is possible to provide patients with the gold standard for patients with multiple myeloma, without delays and with a greater possibility of progression-free survival (PFS).

AUTOLOGOUS HEMATOPOIETIC STEM CELL TRANSPLANTATION: PRELIMINARY RESULTS IN A PRIVATE HOSPITAL IN NORTHEAST BRAZIL

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Introduction: Autologous hematopoietic stem cell transplantation (HSCT-A) is an important therapeutic modality in the treatment of multiple myeloma (MM) and Hodgkin's (HL) and non- Hodgkin's (NHL) lymphomas. Centers specializing in this therapy are still concentrated in the South (S) and Southeast (SE) regions of Brazil, creating a gap in their offer in less favored regions, such as the North (N), Northeast (NE) and Midwest (CO). Our Center is a private hospital institution that serves a population of patients predominantly from these regions.

Objective: To report the preliminary results of the HSCT-A performed in a private hospital located in Fortaleza, Ceará, in Northeastern Brazil.

Casuistry: Between February 2019 and May 2023, 92 HSCT-A were performed at the institution, with all cases being submitted for analysis.

Method: Retrospective analysis of clinical data of patients undergoing the procedure during the study period.

Results: 92 patients from 13 Brazilian states underwent HSCT-A, predominantly from the NE region (80.4%), followed by N (7.6%), CO (6.5%) and SE (5.4%). Ceará was the main source of cases, with 29 transplants (31.5%), followed by Pernambuco (18.5%) and Bahia (16.3%). Of the total, 57 patients were male (62%), with MM being the most common indication (67.4%). The median age was 53 years (16-73 years), with patients with HL being younger (median: 29 years) than those with MM (median: 56 years) and NHL (median: 65 years). The conditioning regimen (CR) used in 91.9% of HSCT-A cases in MM was melphalan 200 mg/m2 (MEL200), while for lymphomas the following were used: LEAM (43.3%), LACE (36 .7%), BEAM (13.3%) and BeACE (6.7%). The median of days to hospital discharge was on D+16, being longer in NHL (D+21) than in HL (D+15) and MM (D+16). With a median follow-up of 18 months (01-51 months), 83 patients are alive (90.2%), with 04 deaths (4.3%) up to D+100, with 03 cases of lymphomas per gastrointestinal toxicity (LACE: 02 cases; LEAM: 01 case) and 01 case of MM due to COVID19, manifested shortly after conditioning, on D-1.

Conclusions: Performing the HSCT-A in our Center facilitated the accessibility of patients from all northeastern states, in addition to those from N and CO, to this treatment modality, especially as a fundamental part of the therapy for MM and relapsed/refractory lymphomas. No treatment-related deaths occurred among patients with MM. The use of lomustine (200 mg/m2) in the LACE and LEAM regimens correlated with marked gastrointestinal toxicity and increased transplant-related mortality.

Keywords: Autologous hematopoietic stem cell transplantation. Accessibility. COVID-19. Gastrointestinal toxicity. Lomustine.

AUTOLOGOUS TRANSPLANTATION IN PATIENTS WITH MULTIPLE MYELOMA: DATA FROM THE FIRST TWO YEARS PROGRAM IN A PUBLIC HOSPITAL IN PORTO ALEGRE-RS

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a potentially curative treatment modality for a wide variety of hematological diseases. It is a highly complex procedure and the success of which directly involves the performance of a specialized multidisciplinary team. Hospital Nossa Senhora da Conceição (HNSC) started an autologous program at the end of 2020 and currently has 2 beds for patients undergoing this procedure.

Objective: To describe the profile of multiple myeloma (MM) patients who have undergone autologous HSCT at HNSC.

Method: Descriptive study that presents data from patients undergoing HSCT at the HNSC hematology unit. Patient follow-up was carried out by the multidisciplinary team starting at the pre-HSCT assessment, discussion of the cases in multidisciplinary rounds, to hospitalization for the procedure and discharge / follow-up. Data were collected from the electronic medical records, according to the routine of each professional team. For the descriptive analysis, frequencies, means, medians and standard deviations were calculated. Results: 22 autologous HSCTs were performed from December 2021 to May 2023. All patients were previously evaluated and followed up by a multidisciplinary team composed of hematologists, nurses, pharmacists, physiotherapist, speech therapist, nutritionist, dentists, psychologists, social workers, hemotherapy service team and nurse navigators. The mean age was 56.6 years (31 - 72 years; SD= 10.7), and 63.6% were male. Mobilization took place on an outpatient basis with filgrastim and on D-2 peripheral stem cells were collected, with an average of 3.54 X 106 CD34 cells/kg (SD= 1.35). The conditioning protocol used was with Melphalan 200mg/m2 in 14 cases (63.6%) and 140mg/m2 in 8 patients (36.4%). All Infusion was of fresh HSC, performed within 48 hours in most patients (n=19). Bone marrow engraftment occurred in a median of 10 days. The median length of hospital stay was 17 days (16 to 36 days). The most frequent complications resulting from HSCT were mucositis (2 grade 1; 9 grade 2; 5 grade 3; 1 grade 4) and febrile neutropenia (n=17). One patient had septic shock and was transferred to the intensive care unit, with recovery and return to the inpatient unit in 4 days. The D+100 transplant-related mortality rate (TRM) was zero.

Conclusions: Data from the first MM patients who underwent autologous HSCT at HNSC demonstrate that the procedure was successful, with low morbidity and without any case of death related to the transplant, demonstrating the importance of specialized multidisciplinary team.

Keywords: autologous transplantation, multidisciplinary team, multiple myeloma.

INFLAMMATORY SYNDROME DURING THE PERI-ENGRAFTMENT PERIOD OF AUTOLOGOUS STEM CELL TRANSPLANTATION IN HODGKIN'S LYMPHOMA PATIENTS PREVIOUSLY TREATED WITH CHECKPOINT INHIBITORS (CPIS): EXPLORING THE CPI-PERIENGRAFTMENT SYNDROME THROUGH CASE REPORTS

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Introduction: Checkpoint inhibitors (CPIs) are used as salvage therapy for refractory and relapsed Hodgkin's lymphoma, leading to significant treatment response. This allows patients to undergo Autologous Stem Cell Transplantation (ASCT) as consolidation therapy. The main complication associated with CPIs treatment is the development of autoimmune phenomena. During the peri-engraftment period, the PERDS (Peri-engraftment respiratory distress syndrome) has been described as the most common inflammatory phenomena.

Objective: To present three case reports of patients with Hodgkin's lymphoma who underwent ASCT after receiving CPIs treatment.

Methodology: From January 2021 to December 2022, nine ASCT were performed in patients with Hodgkin's lymphoma. Of these, three patients who received CPIs prior to transplantation either alone or in combination with chemotherapy (Table 1) presented inflammatory symptoms.

Results: The first case, a 27-year-old male (stage IIXS) had no response to three previous treatments. Nivolumab resulted in a partial response, ASCT was Neutrophil engraftment occurred on Day+11. However, on Day+15, the patient developed fever, dyspnea, and pulmonary congestion, requiring intubation and mechanical ventilation. Corticosteroid therapy was initiated, leading to significant improvement and no further complications. The second case, a 31-year-old male (stage IVBS) achieved complete remission after salvage therapy. Consolidation treatment with ASCT was performed without major complications. During the peri-engraftment period, the patient developed cellulitis, remained febrile, and exhibited respiratory symptoms in need of oxygen support and a skin rash. The condition was considered an inflammatory reaction post-engraftment, and corticosteroid therapy led to improvement and resolution of symptoms. In Case 03, a 32-year-old male (stage IIXA) refractory to previous therapies, achieved complete remission after third-line treatment. Conditioning and stem cell infusion were performed without major complications. During the peri-engraftment period, the patient developed axillary cellulitis and remained febrile. A suspected inflammatory reaction post-engraftment presenting with acute respiratory failure, associated with fever, increased bilirubin and weight gain, led to corticosteroid therapy, resulting in improvement and resolution of symptoms.

Conclusion: Timely identification and management of inflammation are crucial for positive outcomes. Corticosteroids effectively relieve symptoms in these cases. More research is required to understand the link between prior CPI use and peri-engraftment syndrome in ASCT patients and explore the benefits of prophylactic low-dose corticosteroid treatment. This knowledge will enhance patient care and treatment strategies.

Keywords: Checkpoint inhibitors, Autologous Hematopoietic Stem Cell Transplantation, AHSCT, peri-engraftment syndrome

TABLE 1. Description of the three reported cases, with previous treatment, mobilization, conditioning regimen and time to neutrophil engraftment

	Prior Treatment	Response Pre AHSCT	Mobilization	Nº Cell CD34 Infusion (x106 cell CD34/kg)	Conditioning Regimen	Neutrophil Engraftment
Case 01	1º ABVD 2º ICE 3º DHAP 4º Nivolumab	Partial Response	GCSF + Plerixafor	5,43	BEAM	D+11
Case 02	1º A-AVD 2º P-GVD	Complete Response	GCSF only	8,03	BEAM	D+11
Case 03	1º A-AVD 2º ICE 3º P-GVD	Complete Response	GCSF + Plerixafor	10,59	BEAC	D+10

ABVD: Doxorubicin, Vinblastine, Dacarbazine, Bleomycin; ICE: Ifosfamide, Carboplatin, Etoposide ; DHAP: Dexametasone, High Dose Cytarabin and Cisplatin; A-AVD: Brentuximab vedotin, Doxorubicin, Vinblastine, and Dacarbazine; P-GVD: Pembrolizumab, Gemcitabine, Vinorelbine, and Doxorubicin ; GCSF: Filgrastim ; BEAM: Carmustine, Etoposide, Cytarabin and Melphalan; BEAC: Carmustine, Etoposid, Cytarabin and Cyclophosfamide .

COMPARATIVE ANALYSIS OF THE USE OF GRANULOCYTE COLONY-STIMULATING FACTOR (G-CSF) ASSOCIATED WITH CHEMOTHERAPY VERSUS PLERIXAFOR AS MOBILIZATION IN HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Obtaining CTH for application in transplants can be done from peripheral blood, bone marrow or placental umbilical cord blood. Studies have evaluated the association of plerixafor and G-CSF in cases of failure in the mobilization of CD34+ cells, such as in remobilizations and in cases of "on-demand", when during the standard mobilization process, early signs of failure are analyzed. This combination in the rescue protocol has shown excellent results and greater efficacy compared to traditional remobilization, increasing not only the number of cells collected, but also their viability. Thus, there is a decrease in the number of apheresis and in the length of hospitalization.

Objectives: analyses use of plerixafor in mobilization of stem cells.

Methods: This is a retrospective study involving analysis of medical records of patients with the most common hematological neoplasms submitted to transplantation of progenitor hematopoietic stem cells. These patients were treated by a medical group specialized in onco-hematological care: Cancer Treatment Center of Brasília - Cettro. Data were statistically analyzed using the following tools: t-Student/parametric or Mann-Whitney/non-parametric test and comparison between two dependent samples: t-paired/parametric or Wilcoxon/non-parametric. The analyses and representation of the results were performed using the Prism 5® software package (GraphPad, USA); significant values, $p < 0.05$.

Results: A retrospective analysis of 120 patients submitted to HSCT in the defined period was performed. Patients were divided into two groups: those mobilized with QT + G-CSF versus plerixafor. The epidemiological results identified that 60% of the patients were male, with a median age of 55 years (17 to 68 years). Among the most described diseases are: multiple myeloma (55.7%), non-Hodgkin's lymphoma (16.39%), Hodgkin's lymphoma (14.7%) and primary amyloidosis (4.9%). The analysis showed that the plerixafor group compared to G-CSF + QT: positive CD34 cell counts (median 6.2x versus 3.8x, $p < 0.001$), number of apheresis procedure sessions (median 2 versus 4, $p < 0.0002$) and cell viability rate (98% versus 95%, $p < 0.0002$). In addition, the period for bone marrow graft harvesting (hematological recovery) was 10 days for the plerixafor group versus 15.05 days for the G-CSF and QT groups, $p < 0.0055$ (Figure 1).

Conclusion: The results of this study demonstrated that the mobilization group using plerixafor had superior data and statistical significance in relation to the number of apheresis procedures, cell viability, number of CD34+ stem cells and time to bone marrow graft grab earlier when compared to G-CSF + QT. These findings suggest and encourage the use of plerixafor as a standard routine with the aim of reducing the number of apheresis procedures and increasing cell viability and the rate of CD34+ cells collected.

Keywords: plerixafor; hematopoietic stem cell transplantation; mobilization.

CONSTRUCTION OF A MULTIPROFESSIONAL PROTOCOL FOR AMBULATORY AUTOLOGOUS HEMATOPOIETIC STEM CELL TRANSPLANTATION FOR MULTIPLE MYELOMA PATIENTS

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Introduction: Multiple myeloma (MM) is a hematological cancer that affects plasma cells. Autologous hematopoietic stem cell transplantation (HSCT) is an established therapeutic approach for consolidating treatment in MM patients.

Objective: How to assemble a protocol for ambulatory autologous HSCT? Structure a standard multiprofessional institutional protocol (POP) for performing ambulatory autologous HSCT for MM patients.

Method: Methodological study conducted between January and March 2023 with the multiprofessional team of a philanthropic hospital in southern Brazil.

Results: During the creation of the POP, meetings and discussions were held with a multiprofessional team comprising medical professionals, nurses, nutritionists, social workers, and pharmacists specializing in HSCT. The established workflow was structured to assign responsibilities to each professional during the different stages of transplantation, from pre-transplantation to post-transplantation. The initial care pathway begins with the transplantation recommendation by the physician. This is followed by a pre-HSCT evaluation with a specialist nurse who analyzes eligibility criteria such as MM diagnosis, age limit of 60 years, need for full-time companion, own vehicle, and maximum distance of 25 minutes from home to the hospital. A thorough psychological evaluation is also conducted, followed by a home visit to assess living conditions and housing, carried out by a social worker and nurse. After returning for a medical reassessment, the physician may make necessary adaptations. The patient then receives instructions regarding hospitalization and the need for daily travel to the outpatient clinic, provided by a nurse. During the hospitalization phase, which lasts for five days between catheter insertion and the procedure itself, the patient receives discharge instructions and care for the central device from an attending nurse. Following this period, the subject is evaluated in the outpatient clinic, in a private room, where the nurse collects laboratory samples and closely inspects the catheter insertion site. Based on clinical and laboratory evaluations, the physician determines the need for special medications or further hospitalization. Hospital gurneys are reserved for these ambulatory HSCT patients in the hematology department. Conclusion: The HSCT procedure has shown significant growth, with the southeastern region of Brazil performing the highest number of transplants in the country. Considering this expansion, the need for inpatient beds, waiting list delays for transplantation, and the reduction of Healthcare-Associated Infections (HAIs), conducting HSCT on an ambulatory basis is an effective alternative that pursues to contribute to better management and flow within the system.

Keywords: Hematopoietic stem cell transplantation. Oncology nursing. Patient Care Team. Clinical Protocols. Autologous transplantation. Multiple myeloma

HSCT PEDIATRIC

A SECOND ALLOGENEIC HEMATOPOIETIC CELL TRANSPLANT (HCT2) MAY CURE MORE THAN 40% PEDIATRIC PATIENTS WITH HEMATOLOGICAL MALIGNANCIES

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Introduction: Relapse of a malignant hematological disease after allogeneic HCT is associated with poor survival and may not be treated with a curative intent. However, a second HCT (HCT2) may achieve durable remission.

Objective: To determine the outcomes of pediatric patients who received a HCT2 for relapsed malignant hematological diseases.

Casuistic and method: Review of the medical records of pediatric patients who underwent a HCT2 for relapsed malignant hematological diseases in two institutions from 2013 to 2023. OS was estimated using Kaplan-Meier survival analysis. The conventional HCT Comorbidity index (HCT-CI) was calculated for all patients (http://www.hctci.org/Home/Calculator) categorized in < or > 2.

Results: Nineteen patients with a median age of 10 years (range, 2–17) underwent HCT2 for B-ALL (n=8), T-ALL (N=2), AML (n=5), CML-BC (n=2), MDS (n=1) and JMML (n=1). Donor types were unrelated (n=4), haploidentical (n=11), and unrelated cord-blood (n=4). Donors were different at HCT2 in all patients and all haploidentical HCT2 used the other haplotype. All nineteen patients received myeloablative conditioning, and 52% (n=10) were in remission at HCT2. The median remission duration after HCT1 was 12 months (range, 2–22) and the median time between transplants was 16 months (range, 5–30). The median follow-up of surviving patients after HCT2 was 33 months (range, 9–117), with 47% alive at time of analysis. The most common cause of death was disease recurrence (n=6, 31%). At time of analysis, OS, PFS, relapse, and transplant-related mortality (TRM) were 47% (Figure 1), 42%, 45%, and 21%, respectively. OS was 37% (3/8) for B-ALL. All T-cell ALL, CML-BC, MDS and JMML patients are alive, but all 5 patients with AML have died. None of the latter have used post-HCT maintenance to prevent relapse. Pre-HCT2 remission status did not appear to influence OS and PFS, since of 11 patients in remission, 5 remain alive and disease-free. Of the 8 patients transplanted with active disease, 6 remain in remission. Ten patients had HCT-CI < 2 pre HCT2, and 3 of 10 have died. However, 7 out of 9 patients with HCT-CI score≥2 died (HR 4.8, p=0.007) (Figure 2).

Conclusion: A second HCT can be feasible for patients with relapsed malignant hematological diseases. Overall survival is higher than 40%, suggesting that this approach may cure a proportion of the patients, particularly those with HCT-CI<2 pre HCT2.

Keywords: Second allogeneic transplant. Pediatric. HCT-CI. Malignant hematological diseases.

FIGURE 1: **Overall survival**

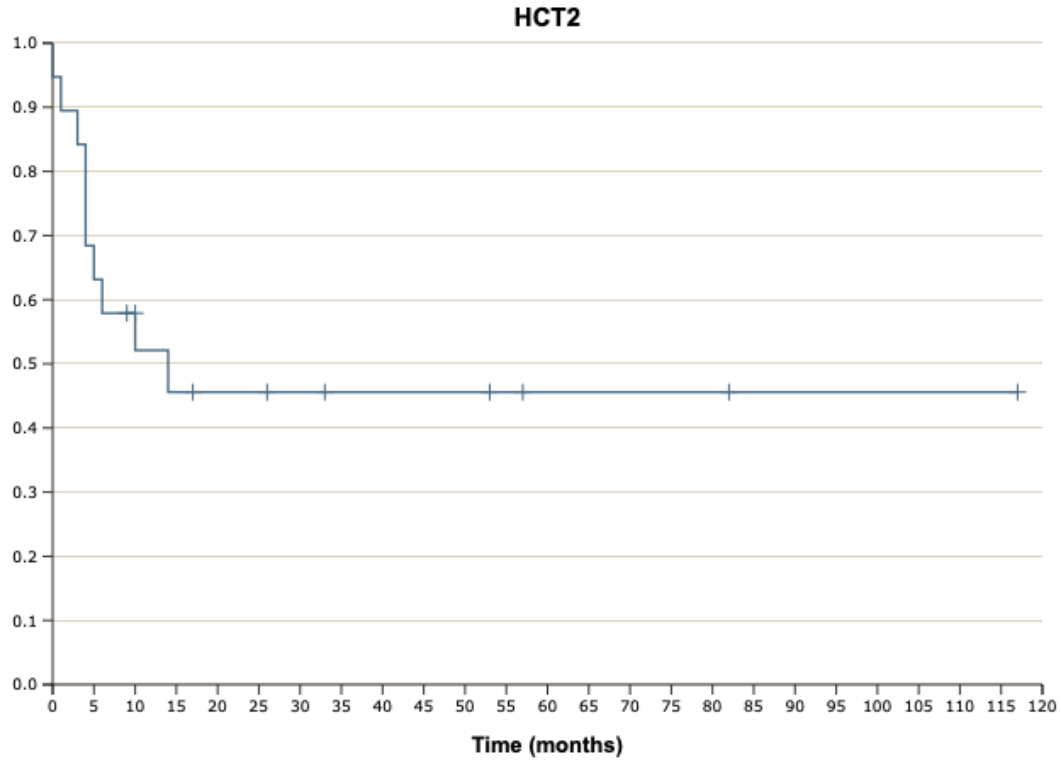
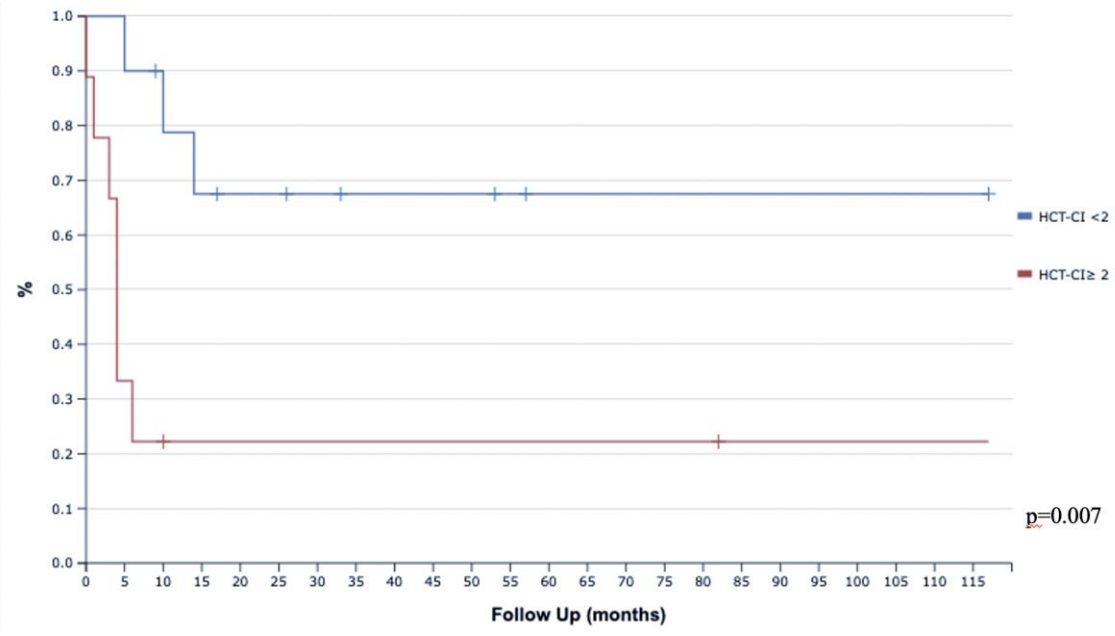


FIGURE 2: **Overall survival according to the Comorbidity Index prior to second Hematopoietic Stem Cell Transplant**



ALLOGENEIC STEM CELL TRANSPLANTATION (HSCT) AS TREATMENT FOR NEUROBLASTOMA (NB)

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Introduction: Neuroblastoma is a rare and aggressive childhood neoplasm, treated with multimodal therapy, which includes autologous stem cell transplantation (ASCT). Some children fail mobilization precluding its performance; others experience relapse after ASCT with a poor chance of recovery, generally being referred to exclusive palliative care. We now understand the vast impact of the immunotherapy on NB control, although it remains inaccessible to most children. An alternative may be an allogenic HSCT, once the graft versus NB effect (GvT) has already been demonstrated and the morbimortality of the procedure has progressively decreased.

Objective: To describe a national multicenter experience with allogenic HSCT in patients with NB. Casuistic: Between 2017 and 2023, 13 children underwent an allogenic HSCT to treat NB in 5 Brazilian institutions.

Methods: Retrospective chart review of all patients reporting allo HSCT to the Pediatric BMT Group. Conditioning regimens were myeloablative based on Bussulfan or Thiotepa. Graft versus host disease (GVHD) prophylaxis was used according to donor type. Post-transplant evaluation was performed according to standard practice in each center. Relapse was defined as the presence of undifferentiated NB confirmed by biopsy or rising of urinary markers. Definition of acute GVHD was based on MAGIC criteria and chronic, on NIH. Overall and event free survival were determined from the date of the HSCT until death. Survival rates were calculated by Kaplan Meier method.

Results: Demographic data from patients, disease and first treatments are described in table 1. The allogenic HSCT indication was relapse after ASCT (8), mobilization failure (2), persistent cytopenia (2) and persistent positive bone marrow infiltration (1). Relapse after ASCT occurred within a median of 11-month (2 – 24); 4 had combined relapse (all with bone marrow infiltration), 2 bony relapses, 2 in primary site and 1 in distant lymphnode. Table 2 illustrates HSCT data. After the allo HSCT, 6 patients had donor leukocyte infusions, and 7 immunotherapy with anti-GD2, not experiencing any unexpected toxicity. Ten developed acute GVHD and 2 chronic GVHD. Transplant-related complications are shown in table 3. Eight children are alive without disease progression (62%), among them, 4 that received anti-GD2. Two died of transplant related toxicity and 2 of progressive disease. One child that relapsed is still alive. Event free survival was 45% and overall survival 57% (Figure 1 and 2). The median follow-up is 11 months (1 – 32 months).

Conclusion: Allogenic HSCT has rescued half of the children that once would be in exclusive palliative care. Anti-GD2 immunotherapy is doable and should be further studied to enhance the GvT effect.

TABLE 1. Patients and disease aspects

Characteristics (n=13)	Number (%)
Age (median)	6 (3-12 years)
Sex	
Male	9 (69%)
Female	4 (31%)
Stage at diagnosis	
III	1 (8%)
IV	12 (92%)
MYCN amplification	
Positive	5 (38%)
Negative	1 (8%)
Unknown	7 (54%)
Patients with previous autologous transplant	
No	4 (31%)
Yes	9 (69%)
Single	8 (89%)
Tandem	1 (11%)
Time from autologous HSCT to relapse: median (range)	11 (2-21 m)
Isotretinoin use after autologous HSCT (n=9)	6 (67%)
Anti-GD2 use after autologous HSCT (n=9)	4 (45%)
Type of relapse/progression before allogeneic HSCTs (n=9)	
Primary site only	2 (22%)
Metastatic	4 (44%)
Bone Marrow	3 (33%)
Status before allogeneic HSCT (n=13)	
Complete remission	6 (46%)
Stable disease	5 (38%)
Progressive disease	2 (15%)

TABLE 2. Allogeneic Transplant Characteristics, engraftment and Graft versus host disease

Characteristic (n=13)	Number (%)
Donor type	
Matched Sibling Donor	1 (7.5%)
Matched Unrelated Donor	1 (7.5%)
Haploidentical Donor	11 (85%)
Preparative regimen	
Busulfan-Fludarabine-Melphalan	10 (77%)
Busulfan-Melphalan	1 (8%)
Thiotepa-Fludarabine-Melphalan	2 (15%)
GVHD prophylaxis	
PT-Cy, MMF and CSA	11 (85%)
CSA	1 (7,5%)
CSA + MTX	1 (7,5%)
Neutrophil engraftment -median (range)	D+17 (12-20)
Prophylactic DLI (n=6)	
Doses – median (range)	2 (1-3)
Anti-GD2 use after allogeneic HSCT (n=7)	
Cycles – median (range)	4 (3-5)
Dendritic cell vaccine (n=5)	
Doses – median (range)	2 (1-6)
Acute GVHD – grade (n=11/13)	
1	4 (31%)
2	3 (23%)
3	4 (31%)
4	none
Organ involvement (n=11)	
Skin only	5 (45%)
Skin and gut	4 (36%)
Skin, gut and liver	2 (18%)
Chronic GVHD – grade (n=13)	
None/mild	11 (85%)
Moderate/Severe	2 (15%)
Organ involvement	
Liver	1 (7.5%)
Gut	1 (7.5%)

FIGURE 1. Event Free Survival

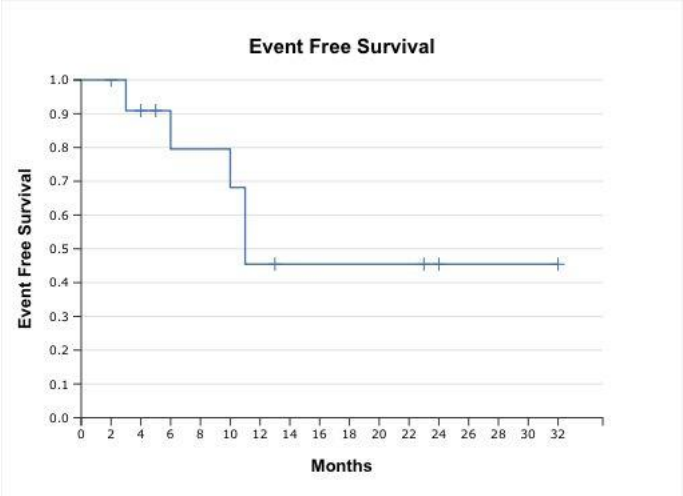
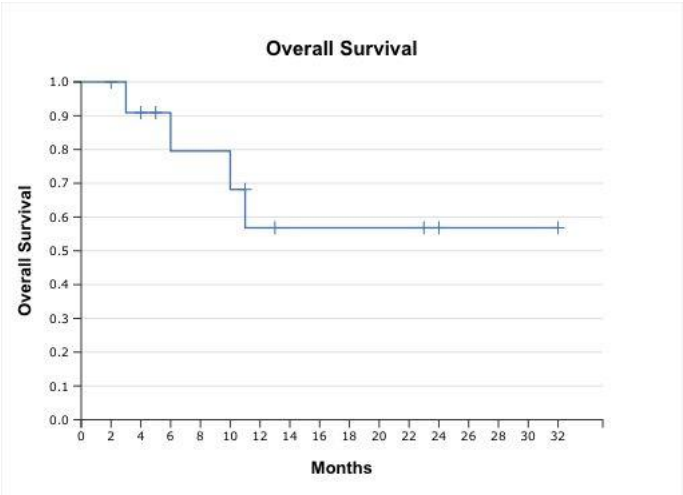


FIGURE 2. Overall Survival



BUSSULFAN, FLUDARABINE AND MELPHALAN (BU-FLU-MEL) HAS A HIGHER INCIDENCE OF SEVERE GRAFT-VERSUS-HOST DISEASE (GVHD) THAN FLU-TBI IN PEDIATRIC PATIENTS WITH ACUTE MYELOID LEUKEMIA (AML) UNDERGOING HAPLOIDENTICAL HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT) IN REMISSION

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Introduction: Patients with AML usually receive either busulfan or total body irradiation (TBI)-based myeloablative conditioning therapies. Over the past decades, we have initially use Flu-TBI 1200 and, more recently, changed to BuFluMel conditioning therapy for children with AML in remission undergoing haploidentical HSCT, according to the Brazilian Gelmai guidelines, maybe sparing these children from the late effects related to TBI. Despite excellent survival with both conditionings, graft-versus-host disease (GVHD) remains a challenge.

Objective: The objective of this study is to compare the incidence of GVHD in pediatric patients with AML after haploidentical HSCT with FluTBI or BuFluMel.

Method: Retrospective study in a single center including all patients under 20 years of age with AML (except AML-M3) in morphological remission undergoing first myeloablative haploidentical HSCT between January 2018 and December 2022. GVHD prophylaxis was performed with cyclophosphamide D+3 and D+4, mycophenolate and calcineurin inhibitor from D+5. Tacrolimus for FluTBI and Cyclosporine (CsA) for BuFluMel.

Results: A total of 23 patients receiving FluTBI (n=13) or BuFluMel (n=10) were included. Two patients died of infections, one in each group; the patient that received BuFluMel had also rejected the graft. One additional patient died of relapse after FluTBI. The overall survival is 86% (20/23). The overall incidence of acute GVHD was 67% (6/9) with BuFluMel and 61% (8/13) with FluTBI, but the all patients had moderate/severe acute GVHD with BuFluMel (6/6; 100%) versus 25% (2/8) with FluTBI. The overall incidence of chronic GVHD was 56% (5/9) after BuFluMel and 45% (5/11) after FluTBI, but moderate/severe disease was seen in 33% (3/9) of the patients after BuFluMel and 18% (2/11) after FluTBI.

Conclusions: Children with AML undergoing 1st haploidentical HSCT had 86% overall survival, but half of them survive with GVHD, that is moderate/severe in 20 – 30% of the patients and, therefore, require a long and careful follow up.

TABELA 1 – Características dos 23 pacientes com LMA submetidos a TCTH Haploidêntico.

	FluTBI (n = 13) (Nº / %)	BuFluMel (n = 10) (Nº / %)	Total (n = 23) (Nº / %)
Idade Mediana < 10 anos > 10 anos	 10,3a (1,3 – 19,4) 6 (46%) 7 (54%)	 6,6a (1,2 – 13) 8 (80%) 2 (20%)	 8a (1,2 – 19,4) 14 (61%) 9 (39%)
Sexo Masculino Feminino	 6 (46%) 7 (54%)	 5 (50%) 5 (50%)	 11 (48%) 12 (52%)
Status CR1 CR2 CR3	 6 (46%) 6 (46%) 1 (8%)	 5 (50%) 5 (50%) 0 (0%)	 11 (48%) 11 (48%) 1 (4%)
Doador Pai Mãe Irmão	 11 (85%) 0 (0%) 2 (15%)	 5 (50%) 3 (30%) 2 (20%)	 16 (70%) 3 (13%) 4 (17%)
Fonte CTP MO	 9 (69%) 4 (31%)	 1 (10%) 9 (90%)	 10 (43%) 13 (57%)
DLI Não Sim	 13 (100%) 0 (0%)	 6 (60%) 4 (40%)	 19 (83%) 4 (17%)
Óbito	2 (15%)	1 (10%)	3 (14%)
DECHa Não Sim - Leve - Moderada/Grave	 5/13 (39%) 8/13 (61%) 6/13 (%) 2/13 (%)	 3/9 (33%) 6/9 (67%) 0/9 (0%) 6/9 (67%)	 8/22 (36%) 14/22 (64%)
DECHc Não Sim - Leve - Moderada/Grave	 6/11 (55%) 5/11 (45%) 3/11 (27%) 2/11 (18%)	 4/9 (44%) 5/9 (56%) 2/9 (22%) 3/9 (33%)	 10/20 (50%) 10/20 (50%)

CLINICAL CASE REPORT: ACUTE LYMPHOID LEUKEMIA AND ITS COMPLICATIONS

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Introduction: Acute lymphoid leukemia (ALL) is the most common type of childhood cancer, constituting about one third of all malignancies in the age group 0-19 years. Treatment is carried out with chemotherapy drugs, taking into consideration clinical, immunological, and cytogenetic features, and whether or not other organs are involved. Sometimes, hematopoietic stem cell transplantation (HSCT) is a therapeutic option in the consolidation of remission, although it may have a high rate of complications and adverse effects that impact the prognosis and quality of life of patients.

Objective: To present a clinical case of early relapsed ALL, submitted to HSCT, which had Sinusoidal Obstruction Syndrome (SOS) as complications in two moments of treatment, in a reference hospital in the southern region of the country.

Methods: For this case report we collected data from the patient's electronic medical records regarding her hospitalization and follow-up.

Case Report: female, 12 years old, with ALL-B, intermediate risk, at diagnosis hyperleukocytosis (234 thousand), negative CSF (positive immunophenotyping), started BFM 2009 protocol in June 2020 (D8: 100 blasts; D15: 0 .02%; D33: 0.001%), during maintenance at week 64, he had septic shock. At week 70, she had intermittent frontal/temporal/occipital headache, photophobia, vomiting, and blurred vision, had the 1st relapse, combined with CNS and Bone Marrow (BM). Protocol changed to BFM 2002, in Block HR1 + MADIT on D1, there was an intercurrence with severe sepsis, clostridium and SOS, ICU for a long time, abdominal condition with collections. She used enteral and parenteral nutrition and had severe muscle depletion. Patient was listed for Haplo HSCT with her father in March 2023. She underwent a myeloablative chemotherapy regimen with radiotherapy + TBI in conditioning, the patient evolved with severe mucositis and continuous abdominal discomfort, not tolerating the volume of the enteral diet on D+7, presented platelet refractoriness, jaundice, increased abdominal circumference and weight (+3kg) on D+18. Transferred to the ICU, on D+22, evolved with SOS, progressive worsening of the general condition, water overload, positive HMC, yeasts, and aspergillus in the OM. On D+25, he had septic shock, worsening of SOS, progressed to hemodialysis, and on D+30, she died.

Discussion: SOS is a systemic disease associated with HSCT, and may also arise after high-dose chemotherapy. Patients present with painful hepatomegaly, elevations in serum bilirubin and liver enzymes, ascites, weight gain, refractoriness to platelet transfusion, and multiple organ failure. The incidence in pediatric patients ranges from 11% to 31%, with a mortality of 50%.

Conclusion: Considering the high mortality rate related to SOS, it is necessary to institute care protocols and daily monitoring from the beginning of conditioning, to detect early signs and symptoms and avoid negative outcomes.

Keywords: Hematology. Pediatrics. Hematopoietic Stem Cell Transplantation.

COMPARISON BETWEEN NUTRITIONAL EVALUATION METHODS IN PEDIATRIC ONCOLOGICAL PATIENTS SUBMITTED TO HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Numerous factors can trigger malnutrition in cancer patients, mainly due to intense inflammatory activity, associated with protein catabolism, reduced food intake and incidence of symptoms with nutritional impact, causing worse quality of life, shorter survival and greater toxicity to cancer treatment. Several parameters can be used to describe nutritional status, including anthropometry.

Objective: To compare the prevalence of malnutrition in the period before hematopoietic stem cell transplantation (HSCT) and after medullary grafting, according to 3 evaluation methods, in pediatric patients undergoing HSCT.

Casuistry: Pediatric patients undergoing hematopoietic stem cell transplantation admitted to a private hospital in São Paulo who underwent HSCT were included in the study.

Method: This is a retrospective study with 38 patients hospitalized between 2021 and 2023 for HSCT. Data were obtained through electronic medical records. Nutritional status was classified according to the WHO growth curves (A), arm circumference (B) and calf circumference (C).

Results: There was a predominance of male patients (63%), with a mean age of 9 years. The prevalent oncological diagnoses were: leukemia (53%), sickle cell anemia (21%), solid tumors (21%), medullary aplasia (5%) and others (8%). Haploidentical related allogeneic transplantation predominated (79%), followed by unrelated allogeneic (13%) and autologous (8%). Regarding the conditioning scheme, the inclusion of TBI (total body irradiation) (50%) and the use of 2 chemotherapy drugs or more (47%) predominated. During HSCT, 97% of the patients were indicated for oral nutritional therapy, 92% for enteral nutritional therapy and 55% for parenteral therapy. Regarding nutritional status, in the pre-HSCT period, the prevalence of malnutrition according to methods A, B and C were respectively: 5%, 24% and 45%. In the post-HSCT period, the prevalence of malnutrition according to these 3 methods were respectively: 8%, 34% and 63%. According to each evaluated method, there was a worsening of the nutritional status in 5% of the cases according to method A, followed by 13% according to method B and 21% according to method C.

Conclusions: The assessment of malnutrition according to calf circumference in pediatric oncology patients is an innovative method, as the reference values for classifying this parameter were only published in 2023; in this study it was observed that this parameter was more sensitive to determine malnutrition, often underestimated in the other parameters.

Keywords: Transplant. Nutritional status. Nutritional therapy.

References: Ferretti RL, Lemos PS, Guedes KJ, et al. Cutoff values for calf circumference to predict malnutrition in children and adolescents with malignant neoplasms: A new parameter for assessment?. Clinical Nutrition Open Science. 2023;48:75-86.

EVAT PROJECT IMPLEMENTATION METHODOLOGY

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Introduction: Pediatric oncology patients hospitalized are at high risk of clinical deterioration and mortality, especially those who undergo Hematopoietic Stem Cell Transplantation (HSCT). Given this clinical condition, the use of a scale for early identification of clinical deterioration is extremely important and is necessary for interventions to be carried out in a timely manner to improve the patient's clinical outcome. Currently there are scales for this purpose, although not all of them encompass the characteristics of pediatric cancer patients. Recently validated for use in Brazil, we have the EVAT scale (Escala de Valoración de Alerta Temprana), which aims to identify early the clinical worsening of these patients and assess the need for unexpected transfer to the Intensive Care Unit. The scale is applied with the participation of nursing technicians in the collection of vital signs and the nurse in the collection of other data, physical examination, final score of the scale, and communication with the medical team. For the proper application of the scale, it is necessary to train the team, before the implementation and adoption of the practice, in the daily routine of a ward.

Objective: To describe the EVAT training plan for the project leaders, as well as the nursing training process for the implementation of the EVAT.

Methodology: Descriptive, observational, restrospective study. Performed in a pediatric unit from September 2021 to August 2022.

Results: The implementation of EVAT began through a partnership with a large American pediatric hospital. The training was carried out for the project leaders, who were responsible for the implementation for the other professionals. The trainings began with theoretical contents, followed by clinical cases, using a realistic simulation laboratory, together with the center responsible for the project online. After this first stage, the training of the care team with theoretical-practical content through realistic simulation began, followed by bedside training, with supervision of the project leaders, where errors were evaluated and improvements were proposed. After the training, a pilot was started, to start the application of the scale, in March 2022. In this period there were around 10% of errors in the applications of the scale, thus generating new discussions and new training to improve adequacy. In August 2022, it was possible to implement the scale in all sectors.

Conclusion: The methodology developed for the qualification and training proved to be adequate and effective, since it was possible to measure the gradual decrease in the evaluation failures of the team. The use of simulated training, through the laboratory, was able to bring a great proximity to reality, generating a greater retention of the content.

Keywords: health education; nursing; paediatrics; hematopoietic stem cell transplantation.

EXPERIENCE WITH AUTOLOGOUS PERIPHERAL BLOOD STEM CELL (PBSC) COLLECTION AND TRANSPLANTATION (HSCT) IN CHILDREN WEIGHTING 25 KG OR LESS

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Introduction: The collection of autologous PBSC from small children may be challenging, especially to professionals proficient in adult Hematology and Hemotherapy. The reason for these autologous collections, now go beyond HSCT, also including therapy with CAR-T cells. Over 24 years of activity and over 1,000 transplants in children and adolescents, approximately 10% were performed in children weighting 25 kg or less.

The objective of this study is to report the experience of autologous HSCT in patients weighing 25 kg or less.

Methods: This is a review of the Laboratory forms and electronic medical records of all transplants performed between Dec,99 and May,23. The PBSC were collected by apheresis through a central venous catheter using the COBE Spectra® with ACD-A, 1:15 ratio, processing around 6 blood volumes. The procedures were repeated until 5x106 CD34+ cells/kg were collected. As of 2012, the target dose was tripled for patients undergoing tandem HSCT. The priming used irradiated and leukocyte poor red blood cells, filtered and resuspended in Normal Saline. During the apheresis, the patients received IV Na, K, Ca, Mg. As of 2016, the PBSC were collected by Spectra Optia®, ACD-A 1:12-1:15 depending on the duration of the procedure, platelet count, and outlet flow. The number of blood volumes was calculated based on the targeted CD34+ and the number on the peripheral blood on the day of the collection. The cells were cryopreserved with a final solution HAES 6%, albumin 4%, and DMSO 5%, and stored in an ultrafreezer. On the day of the infusion, a water bath 37°C was used for thawing the cells in the laboratory, where the quality control samples were drawn. DMSO was initially removed in children < 25 kg, with renal or heart failure, and infusions with > 1g/DMSO/kg using Rubinstein's protocol with a 1:1 dilution in a dextran-albumin solution 5% at 4ºC. Quality control samples were obtained and it was centrifuged at 400g, 4°C for 20 min. The buffy coat was resuspended in the same solution and sent to the floor for infusion. In 2018, patient had DMSO removed if <15 kg and as of October 2021 weight was no longer considered a criterion, only the presence of comorbidities.

Results: A total of 136 transplants were performed in 109 patients weighting < 25 kg: simple thawing in 37 transplants and 99 with DMSO removal. The demographic data is shown in Table 1. The conditioning regimens were used according to the underlying diseases: 21 Bu-Mel, 30 Carbo-Thiotepa (TT), 3 Carbo-VP-TT, 16 CEM, 64 CEM-TT, 1 CTX-Mel, 1 Temodal-TT-Carbo. No patient had graft failure and 72% are alive. Conclusion: Leukoaphereses in our service were performed safely, even large volume procedures. The protocol we propose for children <25 kg include priming with packed red blood cells, infusion of electrolytes during the procedure and continuous monitoring of the patients. Autologous transplantation is safe and feasible in these children.

Keywords: low weight patients, leukoapheresis, pediatric BMT, high volume leukoapheresis.

Results	Total: 109 patients
Total number of leukoaphereses	
1 collection	90
2 collections	15
3 collections	4
Collections – Median (variation)	
Volume (ml) TNC (x108/kg)	165,7 (35 - 825) 12,4 (2,1 - 66,2)
CD34 (x106/kg)	9,1 (2,6 - 239,5)
Total number of transplants	136
1	109
2	15
3	11
4	1
Age – years (range)	2,1 (0,7- 3)
Weight – kg (range)	11 (6,5 – 18,5)
Gender	
Female	61
Male	48
Diagnoses	
Central nervous tumor	54
Neuroblastoma	30
Retinoblastoma	18
Germ cell tumor	6
Atypical teratoid rhabdoid tumor	1

EXPERIENCES AND CHALLENGES ON DAY 0 - INFUSION OF HEMATOPOIETIC STEM CELLS IN PEDIATRICS: EXPERIENCE REPORT OF A RESIDENT NURSE

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INTRODUCTION: Hematopoietic stem cell transplantation (HSCT) is a treatment for hematologic, onco-hematologic, immunologic, or hereditary diseases. It involves the intravenous infusion of bone marrow with the potential to regenerate blood cells, aiming to restore function and assist in the immune process of patients (INCA, 2018). Day 0 represents the day of HSCT infusion and constitutes a critical and challenging moment for the nursing team. This stage is crucial and requires meticulous care and specialized attention to ensure the safety and success of the procedure. Infusion of bone marrow, umbilical cord cells, and hematopoietic precursors of peripheral blood falls within the nurse's competence (COFEN, 1997).

OBJECTIVE: To report the experience of a resident nurse during the bone marrow infusion period in pediatric patients.

METHODOLOGY: Descriptive study, of the experience report type, elaborated from the experience and performance of the resident nurse in pediatrics in the infusion of hematopoietic stem cells, in a Bone Marrow Transplantation unit of a pediatric hospital in Brazil.

RESULTS: Day 0 generates a mix of sensations for the patient, their family, and the nursing team. After the medical prescription for bone marrow infusion, the nurse takes responsibility for verifying information and administering pre-transplant medications. During the infusion, the patient's vital signs are monitored from the beginning to the end of the procedure, including heart rate, blood pressure, oxygen saturation, and body temperature. When the patient is ready for infusion, the stem cell bag is delivered by the blood bank team, and a double check is performed upon arrival, before bag preparation, and before infusion with the person responsible for the patient, to prevent errors. Among the experiences and challenges encountered during this stage, effective communication with the multidisciplinary team, preparation and administration of stem cells, coordination of infusion time to ensure procedure effectiveness, and constant vigilance to identify and manage possible immediate complications are highlighted. Emotional management, support, and adaptation of the procedure to pediatric patients are also crucial, establishing clear and age-appropriate communication, explaining the procedure in a simple manner within their level of understanding, and utilizing distraction strategies such as playful activities to help them feel more at ease during the infusion.

CONCLUSION: These experiences have provided significant professional and personal growth, strengthening both emotional and technical skills for the safe and effective performance of the procedure. Emphasizing the importance of seeking professional development and updates, as well as the opportunity to share experiences and contribute to the improvement of this practice.

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FOLIC ACID DEFICIENCY IN PEDIATRIC CANCER PATIENTS UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Folic acid, also known as vitamin B9, is widely found in green leaves, soybeans, beans, red meat, eggs, viscera, oranges, cheese and demonstrates its importance in several biochemical processes and amino acid metabolism. Its prevalence in pediatric cancer patients undergoing hematopoietic stem cell transplantation (HSCT) has yet to be demonstrated.

Objective: To describe the prevalence of folic acid deficiency and associate it with the nutritional status and diet therapy of pediatric patients hospitalized for HSCT Casuistry: Pediatric patients undergoing hematopoietic stem cell transplantation admitted to a private hospital in São Paulo, who underwent biochemical assessment of vitamins upon admission, were included in the study.

Method: This is a retrospective study with 38 patients hospitalized between 2021 and 2023 for HSCT. Data were obtained through electronic medical records. Nutritional status was classified according to the WHO growth curves (A), arm circumference (B) and calf circumference (C). The collection of exams for biochemical evaluation was performed in the period prior to bone marrow infusion, shortly after hospitalization for HSCT.

Results: Folic acid deficiency was present in 32% of patients, being equally distributed in terms of gender (50% male and 50% female). The prevalence of eutrophy according to method A, B and C was respectively: 92%, 42% and 42%. The prevalence of malnutrition or underweight according to method A, B and C was respectively: 8%, 42% and 58%. During hospitalization for HSCT, 100% of patients received oral supplementation at some time; 100% received enteral nutritional support at some point; 50% required parenteral support at some point during hospitalization. All patients who were thiamine deficient were also deficient in at least 1 other nutrient. Considering the evaluation by the C method, 25% of patients with folic acid deficiency in the pre-HSCT period evolved with a worsening of the nutritional status during the HSCT.

Conclusions: Approximately 50% of patients with folic acid deficiency had malnutrition. Folic acid deficiency associated with other vitamins was present in 100% of the studied population, and could be a result of the usual diet of these patients characterized by low intake of fruits and vegetables.

Keywords: Transplant. Nutritional status. Nutritional therapy. Folic Acid Deficiency.

References: R.L. Ferretti, P.S. Maia-Lemos, K.J.T. Guedes et al. Cutoff values for calf circumference to predict malnutrition in children and adolescents with malignant neoplasms: A new parameter for assessment? Clinical Nutrition Open Science, v. 48, p. 75-86, 2023.

HEMATOPOIETIC STEM CELL TRANSPLANTATION IN CHILDREN AND ADOLESCENTS DIAGNOSED WITH VERY SEVERE IDIOPATHIC APLASTIC ANEMIA: EXPERIENCE OF A BRAZILIAN SERVICE AND COMPARISON WITH THE LITERATURE

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INTRODUCTION: Aplastic anemia (AA) is an autoimmune disease that can affect people at all ages, especially children. Treatment of severe AA has changed in recent decades and its survival has improved, especially after the advent of hematopoietic stem cell transplantation (HSCT) due to low rates of complications and disease recurrence. Haploidentical donors have proven to be increasingly safe in the face of graft versus host disease (GVHD) prevention protocols.

OBJECTIVE: To report the experience of a single pediatric HSCT service in patients diagnosed with very severe AA and to compare with published data.

POPULATION: Patients diagnosed with AA who underwent HSCT between the years 2022 to 2023, less than 18 years old, comprising 5 patients.

METHODS: Retrospective analysis of medical records and calculation of medians and event-free and overall survival curves by the Kaplan-Meier method using SPSS Statistics for Windows, Version 17.0

RESULTS: Five patients were analyzed between May, 2022 to February, 2023, with a median age of 3.1 years (3 males). HSCT was the first-line option in 4 of these. Haploidentical donors were used in 3, with other allogeneic related donors (a brother and a cousin-brother). Reduced intensity conditioning (RIC) was the option in all HSCT. Median time for neutrophil engraftment was 17 days and 20 days for platelet engraftment. Two patients had acute GVHD (aGVHD), all responsible to steroids: one grade 2 aGVHD involving the skin and the other grade 2 involving the skin and lower gastrointestinal tract. Only 2 patients had cytomegalovirus (CMV) reactivation. Complete donor chimerism was observed in 3 patients, all from haploidentical donors, and 2 had mixed chimera with normal blood counts. All patients are alive, in good general health, with no signs of recurrence of the underlying disease. These results were consistent with those observed in the medical literature.

CONCLUSIONS: The study endorses the role of HSCT as a treatment modality for children diagnosed with AA and allows the analysis of experience within the national context as an important modifier of quality of life and clinical future of these patients.

Keywords: Child. Severe aplastic anemia. Stem cell transplantation. Haploidentical. RIC Conditioning. Survival.

HIGH-DOSE CHEMOTHERAPY WITH AUTOLOGOUS HEMATOPOIETIC STEM CELL RESCUE (HCT) TO TREAT PEDIATRIC MEDULLOBLASTOMA: SINGLE VERSUS TANDEM

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Introduction: Central nervous system (CNS) tumors are the most common solid tumors in childhood and medulloblastoma accounts for 15-20% of them. The standard treatment for children with medulloblastoma involves complete surgical resection, followed by radiotherapy and chemotherapy. Strategies based on HCT have been developed to avoid irradiation and therefore, to reduce cognitive and neuroendocrine late effects, that can be devastating in children under 4 years of age. The first protocol used a single HCT with Carboplatin, Thiotepa (TT), and Etoposide. More recently, 2 to 3 cycles of high-dose TT + Carboplatin have been used aiming to decrease toxicity and improve results. However, there is no comparison of these strategies in our country.

Objective: To compare single and tandem HCT to treat patients with diagnosis of medulloblastoma under the age of 3 years in a single institution.

Method: Retrospective chart review of all patients undergoing HCT for medulloblastoma. Overall and disease-free survival were determined by Kaplan-Meier estimates.

Results: Between June 2005 and February 2023, a total of 93 transplants were performed in 70 patients with CNS tumors, 35 of them with the diagnosis of medulloblastoma; 27 patients had a single HCT and 8 underwent tandem HCT, with a total of 50 HCT for medulloblastoma. The median age was 3.1 years, 37% female. Single HCT were performed between 2005 and 2022 with a median follow-up of 50 months and Tandem HCT between 2019 and 2023 with 13 months of median follow-up. Complete remission was documented in 24/27 (89%) and 5/8 (62%) patients prior to HCT, respectively. There was one transplant-related death in each group due to infection and pulmonary hemorrhage and Covid. A total of 20 of 27 patients are alive and disease-free after a single HCT and 7 of 8 undergoing Tandem HCT. Overall survival was 74% after Single and 75% after Tandem HCT, and disease-free survival was 70% and 63%, respectively.

Conclusion: The two treatment strategies yielded similar results despite more advanced diseases in the patients undergoing Tandem HCT, 38% of them not in remission at the time of HCT. Both strategies are safe, with one transplant-related mortality in each group. Long term follow-up will be necessary to evaluate cognitive and neuroendocrine outcomes with these strategies.

Keywords: Pediatric – Autologous – Brain tumor – Medulloblastoma - Tandem.

NUTRITIONAL RISK CONSIDERING PREALBUMIN AND NUTRITIONAL STATUS IN PEDIATRIC ONCOLOGICAL PATIENTS SUBMITTED TO HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Although prealbumin is not considered a nutritional marker, it can be recognized as an inflammatory marker that is associated with nutritional risk in the context of nutritional assessment and reflects the patient's inflammation status.

Objective: To correlate nutritional risk through prealbumin dosage with the nutritional status of pediatric patients hospitalized for HSCT. Casuistry: The study included pediatric patients undergoing hematopoietic stem cell transplantation admitted to a private hospital in São Paulo, who underwent biochemical assessment of vitamins upon admission.

Method: This is a retrospective study with 38 patients hospitalized between 2021 and 2023 for HSCT. Data were obtained through electronic medical records. Nutritional status was classified according to calf circumference. The collection of exams for biochemical evaluation was performed in the period prior to bone marrow infusion, shortly after hospitalization for HSCT.

Results: The prealbumin level was below the reference levels in 34% of the patients, 54% female and 46% male. The prevalence of eutrophy and malnutrition was 46% and 54%, respectively. All patients who showed reduced serum levels of prealbuminemia in the analysis showed a deficiency of at least 1 vitamin. Worsening nutritional status during HSCT was seen in 23% of patients with reduced pre-HSCT pre-albumin levels.

Conclusions: More than 50% of the patients who had reduced serum levels of prealbumin in the pre-HSCT period had malnutrition as measured by calf circumference. All showed deficiency of at least 1 vitamin.

Keywords: Transplant. Nutritional status. Nutritional therapy. Pre-Albumin.,

References: Ferretti RL, Lemos PS, Guedes KJ, et al. Cut-off values for calf circumference to predict malnutrition in children and adolescents with malignant neoplasms: A new parameter for assessment?. Clinical Nutrition Open Science. 2023;48:75-86.

OPPORTUNITIES TO IMPROVE ACCESS TO PEDIATRIC HEMATOPOIETIC STEM CELL TRANSPLANTS (HSCT)

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a therapeutic modality that can benefit many patients with different diseases. However, there are limitations that may delay treatment or prevent the child from being transplanted. It is essential to evaluate the most important reasons to identify opportunities to improve the processes and increase access to HSCT.

Objective: To identify the main factors that hinder access to HSCT.

Method: Retrospective cohort study of patients referred to HSCT in a pediatric center but who were not transplanted.

Results: From December 2022 to May 2023, 119 patients were referred for HSCT, but 60 (50%) of them were not transplanted. The latter were 55% male patients, had a median age of 6.5 years (1-20), had acute leukemias (33%), lymphomas (5%), solid tumors (18%), sickle cell disease (17%), severe aplastic anemia (13%), other non-malignant diseases (13%). The most common referral was for an allogeneic HSCT (78%). Eight children (13%) had the history thoroughly reviewed and both medical teams have agreed that the HSCT might not be indicated at that time; 7 were referred to another transplant center.

Unexpectedly, the most important obstacle for the allogeneic HSCT was unavailability of a suitable HSCT donor in 45 children (38%): donors were unavailable or unfit (25%), the disease had already progressed before HSCT (22%), recipients were unfit (22%) due to positive serologies, need for extensive dental treatment, infections, need for desensensitization due to positive anti-HLA panel and high HbS with need for pre-HSCT exchange transfusions, death (16%), no answer from the referring physician (13%) and lack of approval of the insurance company (2%). Donor ineptitudes reinforced the need for backup donor whenever possible. The progression of the disease, ineptitude of the recipient and death reveal the need for early referral to transplant centers and a comprehensive care, so that the patient and the families can be assisted in all their needs, since other factors besides the underlying disease can also impact on the delay to treatment. Conclusion: We observed that half of the referred patients could not undergo HSCT, showing the complexity of this access and highlighting extrinsic factors that corroborate for such limitations. Thus, it is extremely important to have public policies that guarantee the access of all patients with indication of HSCT.

Keywords: Hematopoietic Stem Cell Transplantation. Paediatrics. Bone marrow. Stem cells. Barriers to Access to Health Care.

PROPHYLAXIS GRANULOCYTES TRANSFUSION FOR PREVENTING INFECTIOUS IN PEDIATRIC PATIENTS UNDERGOING BONE MARROW TRANSPLANT

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Introduction: Granulocytes transfusion (GT) have a long history of usage in clinical practice to support and treat severe infection in high-risk groups of patients with neutropenia or neutrophil dysfunction with fungus or bacterial infection. For oncologic or oncohematology patients the bone marrow transplant (BMT) is an important part of the treatment but infections conditions can lead to delay thus leading to a worsening of the patient's prognosis. It is also known that during BMT infectious conditions in general are related to increased morbidity and mortality in these patients.

Objective: The objective was to evaluate the evolution and mortality during the peri-BMT treatment of pediatric patients who received prophylactic granulocyte transfusion (PGT) compared to patients who received a therapeutic granulocyte infusion (TGT).

Methods: During the conditioning regimen for BMT the PGT group received granulocytes transfusion from onset of neutropenia to bone marrow engraftment, defined as neutrophils above 500/mm3 for 02 consecutive days, in order to aid in the treatment and prevent progression of the infectious condition. On the other hand, the TGT group received granulocytes transfusion when infections conditions were already stablished during the BMT. For the patients of PGT group, before BMT, 07 had fungus infection, 03 neutropenic fever and 02 bacterial bloodstream infection with persistent positive culture. For the patients of TGT group BMT, 02 had fungus infection, 01 bacterial infection and 01 persistent neutropenia with fever and the TGT group non BMT 03 had fungus infection and 02 bacterial infection.

Results: In the analyzed period from January 2015 to December 2021, a total of 21 pediatric patients received GT, being 16 candidates for BMT that received in total 364 GT with infusion average of 2.29 x 1010 cells (minimum of 0.80 x1010 – maximum of 9.72 x 1010). From the 16 pediatric patients, 12 received PGT and 04 received TGT. In the PGT group all the patients survived and went to BMT with marrow graft media of 20 days (14-37) on the other hand in the TGT group marrow graft media of 17 days (14-20) with 50% of mortality. The 05 non BMT pediatric patients received from the TGT group in total 51 GT with infusion average of 3.36 x 1010 cells (minimum of 1.48 x1010 – maximum of 6.90 x 1010). Mortality was 100%.

Conclusion: Prophylactic granulocytes transfusion used as therapy for pediatric patients undergoing BMT since the beginning of neutropenia improved survival allowing these patients to go for successfully BMT.

TABLE 1: Diagnosis of pediatric patients

DIAGNOSIS	BMT	NON BMT	TOTAL
ALL	7	3	10
AML	4	1	5
NHL	1	0	1
APLASTIC ANEMIA	0	1	1
BIPHENOTYPIC LEUKEMIA	1	0	1
SCID	1	0	1
TERATOID TUMOR	1	0	1
LYMPHOHISTIOCYTOSIS	1	0	1
TOTAL	16	5	21

UNRELATED ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT) WITH CLASS I ANTIGENIC MISMATCH WITH IN VIVO POST-TRANSPLANT CYCLOPHOSPHAMIDE (PT-CY) FOR GRAFT VERSUS HOST DISEASE (GVHD) PROPHYLAXIS: PROMISING STRATEGY TO TRANSPLANT PATIENTS WITH NON-MALIGNANT GENETIC DISEASES

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Introduction: Despite the progress in haploidentical stem cell transplantation (HSCT), many patients do not have a suitable healthy family donor. Transplants from matched unrelated donors would be ideal, but they are not available to most patients. One emerging treatment option is to use mismatched unrelated donors with PT-Cy to avoid GVHD, especially in patients with non-malignant diseases. Diamond Blackfan Anemia (DBA) is caused by a defect in erythropoietic progenitors, resulting in severe anemia of very early onset, usually before the first year of life. First-line treatment options for DBA are regular red blood cell transfusions, iron chelation, and corticosteroids, but only 40% of the patients respond to the latter. Thus, allogeneic HSCT is the only curative treatment for the hematological manifestations of this disease. The main difficulty is to identify a healthy HLA-identical donor, what limits the access of many patients to this curative therapy.

Objective: To describe the strategy using an unrelated donor with Class I antigenic HLA incompatibility and PT-Cy to prevent GVHD.

Method: The best available donors are chosen in a regular meeting with the Institute of Immunogenetics (IGEN) team, in which all haploidentical family members are considered, with corresponding ABO typing, age and weight, as well as the national and international donor searches. The anti-HLA panel is always considered. Conditioning regimens are chosen based on the Pediatric BMT Group of the SBTMO consensuses. GVHD prophylaxis with PT-Cy, mycophenolate mofetil and cyclosporine are used in haploidentical transplants and, more recently, also for mismatched unrelated donors. The preferred graft source is always the bone marrow, except in extreme conditions with an expected increased chance of graft failure.

Result: A 1 year and 6 months baby girl was diagnosed with DBA at the age of 2 months of life. She remained transfusion-dependent after two steroid cycles. No HLA-compatible related or unrelated donor was found. A 38-year-old unrelated male donor was chosen, with compatible ABO typing and two HLA mismatches, antigenic incompatibility in the A locus and a permissive DP mismatched (HLA 10x12). Conditioning was based on the SBTMO 2021 consensus, with Busulfan, Fludarabine and ATG. Due to the A mismatch, GVHD prophylaxis included PT-Cy, MMF and CsA. After a fresh bone marrow graft, she had neutrophilic engraftment on D+18 and platelet engraftment on D+28. She had no important side effects and was discharged from the hospital on D+21. On D+29 she was admitted with bloody diarrhea due to adenovirus and developed upper respiratory infection due to Parainfluenza. The child currently remains on cyclosporine, with no signs or symptoms of GVHD, with complete chimerism and good graft function.

Conclusion: The use of PT-Cy may overcome class I mismatches in the unrelated donor setting and expand the donor pool and the results of these transplants.

UPFRONT STEM CELL TRANSPLANTATION WITH ALL DONOR TYPES VERSUS IMMUNOSUPPRESSIVE THERAPY FOR CHILDHOOD APLASTIC ANEMIA: A SINGLE CENTER INTENT TO TREAT ANALYSIS.

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The treatment of choice for SAA is an allogeneic stem cell transplant (ASCT) from a fully matched sibling (MSD), resulting in the correction of the disease for over 90% of patients. Current guidelines call for immunosuppressive therapy (IST) for patients lacking an MSD. Patients with no response to IST frequently receive an ASCT from an alternative donor, either an unrelated URD or, more recently, a haploidentical (Haplo) donor. The outcome for patients transplanted after failing IST or relapsing after an initial response is poor. Recent studies have shown similar survival with upfront MSD or an unrelated donor, and many groups are moving in that direction. We present an intent-to-treat analysis comparing upfront ASCR with IST in children with SAA.

Methods: Patients with SAA treated at our center since 1996 are included in this analysis. Patients received an ASCT from an MSD, MUD, MMUD, or haplo donor. In most cases, we used a conditioning regimen with ATG, fludarabine, and cyclophosphamide. IST patients received cyclosporine and rabbit ATG. We performed an intent-to-treat analysis comparing both groups. Endpoints were the correction of SAA, EFS, and OS. Events included death from any cause or rescue ASCT. Response to therapy was analyzed with two-tailed t-tests and survival with Kaplan Meier.

Results: 47 patients were included in the analysis. The median time to follow up of at-risk patients was 7.2 years. Twenty-one were treated with ASCT, and 26 with upfront ASCT. Donors types were 13 MSD, 11 URD and 2 Haplo. 8/21 (38%) in the IST group had full correction of SAA compared with 25/26 (96%) in the ASCT group ($p<0.01$). 8 pts in the IST group and 1 in the ASCT received a rescue ASCT. 5-year EFS was 92% (73%-97%) in the ASCT group compared to 52% (17%-56%) in the IST group ($p<0.01$), and OS was 96% (76%-99%) in the ASCT compared with 69% (38%-80%)in the IST group. There was no difference in outcome among donor types. The time from diagnosis to transplant did not impact survival for all transplanted patients.

Discussion: Our intent-to-treat analysis demonstrated that upfront ASCT from any suitable donor results in a significative better outcome than IST, even when rescue ASCT is considered for patients failing IST. A transplant team should evaluate Children with SAA as soon as the diagnosis is made to search for a suitable donor. Patients without MSD benefit from an upfront alternative donor transplant.

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Keywords: severe aplastic anemia, children, upfront stem cell transplantation, alternative donor, immunosuppressive therapy.

TABLE 1. Patients characteristics.

Age	IST (21)	ASCT (26)	
	9.5	9.9	
1996-2014	15	7	P< 0.01
2015-2022	6	19	
SAA/vSAA	7/15	9/16	
Time from diagnosis to treatment initiation	32 (1-121)	73 (12-150)	P<0.01
MSD		13	
MUD/MMUD		11	
Haplo		2	
Full correction of SAA	8	25	P<0.01
No response /partial correction	13	1	
Relapse /graft failure	2	1	
Rescue ASCT	8	1	
5yr EFS	52 (17-56)	92 (73-97)	P<0.01
5 yr EFS	69 (38-80)	96 (76-99)	P=0.02

FIGURE 1: **Event free survival**

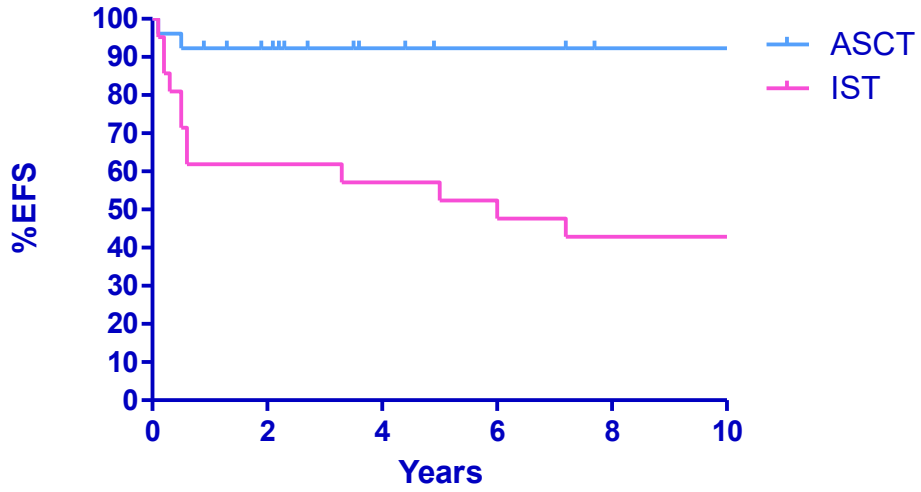
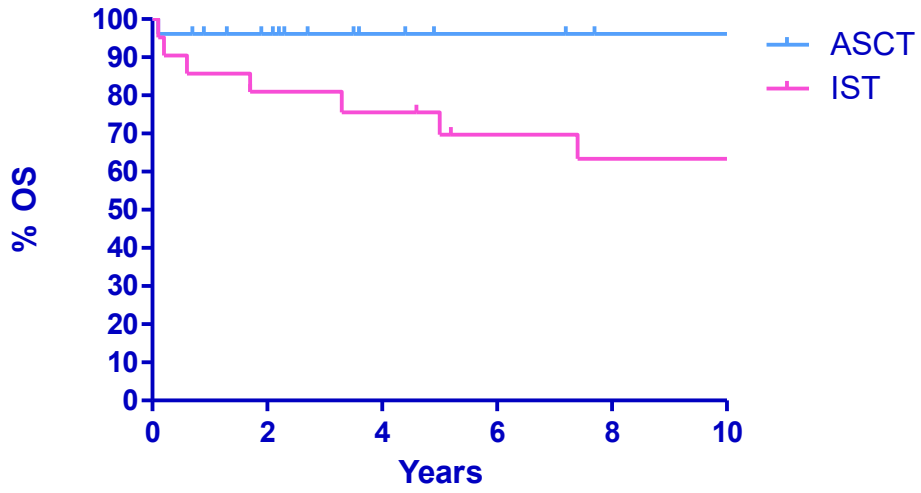


FIGURE 2. **Overall survival**



VITAMIN A DEFICIENCY IN PEDIATRIC ONCOLOGICAL PATIENTS SUBMITTED TO HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Hypovitaminosis A is a deficiency disease and a serious public health problem, mainly in developing countries. It occurs mainly in preschoolers and may be associated with protein-caloric deficiency. In pediatric cancer patients undergoing hematopoietic stem cell transplantation (HSCT) this study is scarce.

Objective: To describe the prevalence of hypovitaminosis A and associate it with the nutritional status and diet therapy of pediatric patients hospitalized for HSCT.

Casuistry: Pediatric patients undergoing hematopoietic stem cell transplantation admitted to a private hospital in São Paulo, who underwent biochemical assessment of vitamins upon admission, were included in the study.

Method: This is a retrospective study with 38 patients hospitalized between 2021 and 2023 for HSCT. Data were obtained through electronic medical records. Nutritional status was classified according to the WHO growth curves (A), arm circumference (B) and calf circumference (C). The collection of exams for biochemical evaluation was performed in the period prior to bone marrow infusion, shortly after hospitalization for HSCT.

Results: Hypovitaminosis A was present in 45% of patients, most of whom were male (53%). The prevalence of eutrophy according to method A, B and C was respectively: 94%, 59% and 59%. The prevalence of malnutrition or underweight according to method A, B and C was respectively: 6%, 35% and 41%. During hospitalization for HSCT, 100% of patients received oral supplementation at some time; 94% received enteral nutritional support at some point and 47% required parenteral support at some point during hospitalization. All patients who had hypovitaminosis A also had a deficiency of at least 1 other nutrient.

Conclusions: Almost half (45%) of patients undergoing HSCT had hypovitaminosis A in the pre-HSCT period, requiring supplementation during hospitalization. Vitamin A deficiency associated with other vitamins was present in 100% of the population studied, and may be the result of the usual diet of these patients resulting from symptoms and aversions to treatments prior to HSCT.

Keywords: Transplant. Nutritional status. Nutritional therapy. Vitamin A Deficiency

References: R.L. Ferretti, P.S. Maia-Lemos, K.J.T. Guedes et al. Cutoff values for calf circumference to predict malnutrition in children and adolescents with malignant neoplasms: A new parameter for assessment? Clinical Nutrition Open Science, v. 48, p. 75-86, 2023.

VITAMIN B1 DEFICIENCY IN PEDIATRIC ONCOLOGICAL PATIENTS SUBMITTED TO HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Vitamin B1, also called thiamine, is essential for energy biosynthesis and plays an important role in the conduction of nerve impulses. Reports on its deficiency in pediatric cancer patients undergoing hematopoietic stem cell transplantation (HSCT) have not been identified in the world literature.

Objective: To describe the prevalence of thiamine deficiency and associate it with the nutritional status and diet therapy of pediatric patients hospitalized for HSCT. Casuistry: Pediatric patients undergoing hematopoietic stem cell transplantation admitted to a private hospital in São Paulo, who underwent biochemical assessment of vitamins upon admission, were included in the study.

Method: This is a retrospective study with 38 patients hospitalized between 2021 and 2023 for HSCT. Data were obtained through electronic medical records. Nutritional status was classified according to the WHO growth curves (A), arm circumference (B) and calf circumference (C). The collection of exams for biochemical evaluation was performed in the period prior to bone marrow infusion, shortly after hospitalization for HSCT.

Results: Thiamine deficiency was present in 29% of patients, most of whom were male (55%). The prevalence of eutrophy according to method A, B and C was respectively: 100%, 91% and 64%. The prevalence of malnutrition or underweight according to method A, B and C was respectively: 0%, 9% and 36%. During hospitalization for HSCT, 100% of patients received oral supplementation at some time; 100% received enteral nutritional support at some point; 55% required parenteral support at some point during hospitalization. All patients who were thiamine deficient were also deficient in at least 1 other nutrient.

Conclusions: Most patients with thiamine deficiency had a nutritional status of eutrophy. Vitamin B1 deficiency associated with other vitamins was present in 100% of the population studied, and may be the result of the usual diet of these patients resulting from symptoms and aversions to treatments prior to HSCT.

Keywords: Transplant. Nutritional status. Nutritional therapy. Thiamine deficiency.

References: Ferretti RL, Lemos PS, Guedes KJ, et al. Cutoff values for calf circumference to predict malnutrition in children and adolescents with malignant neoplasms: A new parameter for assessment?. Clinical Nutrition Open Science. 2023;48:75-86.

INFECTIOUS COMPLICATIONS

COVID-19 IN ADULT HEMATOPOIETIC STEM-CELL TRANSPLANT RECIPIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF CLINICAL CHARACTERISTICS AND OUTCOMES

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Introduction: COVID-19 has a higher rate of severe or critical disease in patients after hematopoietic stem-cell transplantation (HSCT).

Objectives: analyze, by performing a systematic review and metanalysis, all studies that evaluated clinical characteristics and outcomes of COVID-19 in adults HSCT patients.

Methods: the following five databases were searched on Apr 26th, 2023: MedLine, Embase, SCOPUS, LILACS and Web of Science. Two reviewers independently screened papers' titles and abstracts for inclusion and extracted data. We used the "MetaXL" package for Microsoft Excel 2019 for performing the meta-analysis. The pooled prevalence of severe/ critical disease and of death with a 95% CI was calculated with the random-effects model. The I2 statistic was used to measure heterogeneity.

Results: sixteen studies were included in the analyzes, most of them performed in Europe. The total number of patients in the studies was 1.117. The pooled prevalence of severe/ critical COVID-19 was 24.0% (95% CI 0.13-0.36; I2 = 94%; n=334/990). The pooled prevalence of death for the entire population was 17% (95% CI 0.13-0.22; I2=76%; n=221/1,117), 17% (95% CI 0.12-0.23; I2=67%; n=152/822) for allogeneic-HSCT and 14% (95% CI 0.08-0.22; I4=65%; n=48/293) for autologous-HSCT. Nine studies evaluated independent risk factors associated with death. Four of them showed an association with COVID-19 diagnosed within 12 months of transplantation.

Conclusions: the prevalence of severe or critical COVID-19 and lethality in HSCT adult patients is high. Infection within 12 months of HSCT is associated with risk of death.

Keywords: COVID-19; SARS-CoV-2; hematopoietc stem-cell transplantation

COVID-19 SURVEILLANCE IN A BONE MARROW TRANSPLANTATION UNIT: EXPERIENCE FROM A BRAZILIAN TERTIARY-CARE TEACHING HOSPITAL

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Introduction: The COVID-19 pandemic led to several challenges in the hematopoietic stem-cell transplantation (HSCT) setting. In this work, we aimed to describe the strategy of the weekly SARS-CoV-2 RT-PCR surveillance program that was implemented in our Bone Marrow Transplantation (BMT) unit.

Methods: In our hospital, the Kidney, Liver and the BMT units performed SARS-CoV-2 RT-PCR before hospitalization and then weekly during hospitalization even if the patient was asymptomatic. The exam was also performed in patients that developed any respiratory symptom during hospital stay. The other areas of the hospital only performed SARS-CoV-2 RT-PCR before admission and if symptoms arise. From May-2021 to May-2022 we collected data from all patients that were admitted in our BMT unit to perform transplantation. The total of SARS-CoV-2 RT-PCR performed and the positive rate were described.

Results: During the study period 65 patients were admitted for HSCT. A total of 414 SARS-CoV-2 RT-PCR were performed in the BMT unit. The median number of SARS-CoV-2 RT-PCR performed per month was 32 (22-41). 64 nosocomial infections of COVID-19 were confirmed during the study period (26 were asymptomatic and 38 symptomatic) in the entire hospital. From these, four (6.25%) occurred in the transplantation units (all of them were asymptomatic). Two of these cases were detected in the BMT unit (positivity rate in the BMT unit: 0.48%). After the positive test, both patients were isolated outside the HSCT nursery. Then, all HCWs of the unit had to perform SARS-CoV-2 RT-PCR even if they were asymptomatic: in none the result was detectable. We postulate that diagnosing these patients and isolating then outside the transplantation unit may have prevented secondary symptomatic cases.

Conclusion: Weekly SARS-CoV-2 RT-PCR could be a strategy for surveillance in high-risk areas, such as the BMT unit.

Keywords: COVID-19; SARS-CoV-2; Hematopoietic Stem Cell Transplantation; Infection Control

DISSEMINATED FUSARIUM INFECTION AFTER ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION: A CASE REPORT

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Introduction: Fusariosis is an opportunistic fungal infection that leads to significant morbidity and mortality in many immunocompromised patients. The incidence of mortality ranges from 50% to 70% in immunocompromised hosts, such as patients undergoing hematopoietic stem-cell transplant (HSCT). We reported a case of a patient who had a good response to treatment with granulocyte transfusion.

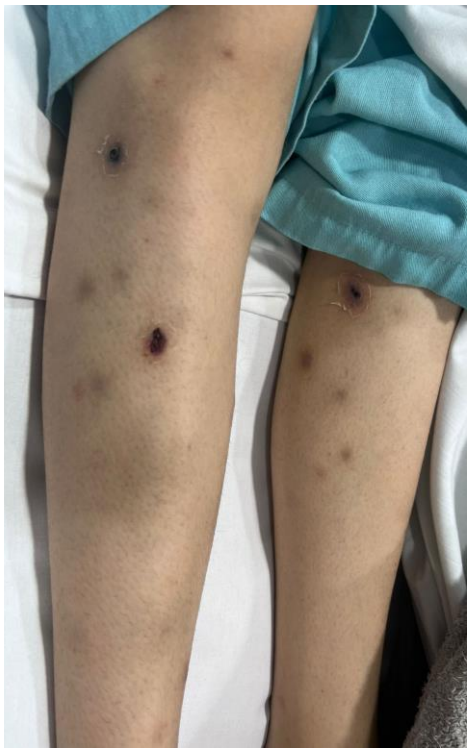
Objective: To describe the clinical presentation and management of highly resistant, disseminated Fusarium infection in one immunocompromised pediatric patient.

Case: 15-year-old female diagnosed with bone marrow aplasia due to Nocturnal Paroxistic Hemoglobinuria. She was referred for a HSCT after failing the treatment with Cyclosporin (CSA) and steroids. She went through a 10/10 match unrelated donor (MUD) HSCT, non-myeloablative conditioning. She had primary graft failure/poor graft function due to E.coli septic shock. Chimerism at D+26 and +39 showed 49%. Erythematous nodules appeared twenty-five days after transplant. Some of the nodules had a purplish central area and appeared thru out her body. A biopsy was performed and sent for histopathological and microbiological study and confirmed the Fusarium diagnosis. She was on oral voriconazole prophylaxis which was switched to therapeutic IV voriconazole and Amphotericin B was added. She also had bilateral pleural effusion, but it was not possible to confirm a fungal diagnosis due to her hematologic condition. Her condition worsened and the lesions increased two days later, as she was pancytopenic, granulocyte transfusion was started and performed for twelve days. She had some improvement and received a second transplant using her mother as a donor, as the MUD was unavailable. She remained on IV Voriconazole. Except for Alemtuzumab anaphylaxis, she had no complications. Neutrophil engraftment was achieved on day 13, with 100% donor chimerism. She had no fever or organic dysfunction and the skin lesions healed. IV Voriconazole was switched to oral. The therapeutic dose will be kept for as long as she is on immunosuppression. Secondary prophylaxis will be used for at least the first year following HSCT. She was discharged twenty-four days after the second transplant.

Conclusion: Our case demonstrates the safety of using combination liposomal amphotericin B with voriconazole for the management of invasive Fusarium infection in the pediatric immunocompromised population in association with granulocyte transfusion. Future studies are needed to assess the specific dose, frequency, and duration of combination antifungal therapy in this context.

Keywords: Fusarium infection; stem cell transplant; granulocyte transfusion.

FIGURE 1: Disseminated fusarium infection: Erythematous nodules appeared twenty-five days after transplant. Some of the nodules had a purplish central area and appeared thru out her body.



EPIDEMIOLOGICAL PROFILE OF PATIENTS UNDERGOING HEMATOPOIETIC STEM-CELL TRANSPLANTATION IN A HIGHLY COMPLEX HOSPITAL

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Introduction: Hematopoietic stem-cell transplantation (HSCT) is a therapeutic strategy indicated for patients with onco-hematologic diseases. During conditioning, chemotherapy and immunosuppression are required, leading the patient to a low or non-existent immune defense scenario. Thus, opportunistic infections can lead to undesirable outcomes such as delayed recovery or, in more severe cases, may result in the patient's death. Therefore, it is important to know the epidemiology of a hospital where HSCT is conducted in order to identify which infectious agents are more prevalent or possible to occur in this environment.

Objective: To describe the episodes of infectious complications in the HSCT process of patients attended at the Hospital Nossa Senhora das Graças (HNSG - Curitiba/PR).

Casuistic: 79 patients who underwent HSCT during the period between January 1 and December 31, 2022 were included.

Method: A comparative and retrospective analytical review was performed by active search of patient records and hospital registries. Data were summarized using descriptive statistics, counts and percentage distribution. Comparative analyses were performed using Mann-Whitney or Chi-square tests (SPSS, v.25, IBM). The study was registered with the HNSG Research Ethics Committee (#69490323.8.0000.0269).

Results: Of the 79 patients included, 54.4% (n=43) were male, with a median age of 49 years [IQR: 32,61.2 years]. A total of 40 autologous (50.6%) and 39 allogeneic (49.4%) transplants were performed. The main clinical indications were multiple myeloma (n= 25, 31.6%), followed by AML (n=11, 13.9%) and non-Hodgkin lymphoma (n=10, 12.7%). Post HSCT infections were reported in 37 patients (46.8%), most of them of bacterial etiology (n=27, 34.2%). Some of the main microorganisms identified were Clostridium difficile (n=8, 10.1%), Escherichia coli ESBL (n=4, 5.1%) and Staphylococcus epidermidis (n=4, 5.1%), followed by Enterococcus faecium (n=3, 3,8%) and Enterobacter cloacae (n=3, 3,8%). Neutrophil engraftment occurred at a median of 17 [13,19] days for patients who had some type of infection on post-transplant, while the control group had a median of 11 [10,12] days for the neutrophil recovery ($p < 0.001$). In patients who had post-HTCT infections, bacterial infections occurred with a median of 7 [4,15] days, while fungal infections showed a median of 30 [25,61] days. After HSCT, 7 patients died (8.9%) but there was no significant correlation between the occurrence of infections in the post HSCT period and the outcome.

Conclusions: The occurrence of bacterial infections after HSCT occurred during the period of neutropenia, when immune defenses are expected to be reduced. Fungal infections showed a late onset profile. The measures of care taken in the post-transplant period contribute to the successful rate of HSCT and the low occurrence of infection-related mortality.

Keywords: Hematopoietic Stem-Cell Transplantation. Epidemiology. Microbiology. Infectious complications. Infection-related Mortality.

EQUIPMENT USED FOR PREVENTION OF HOSPITAL-ACQUIRED INFECTION IN THE BONE MARROW TRANSPLANTATION UNIT

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Introduction: The hospital environment is extremely conducive to hospital-acquired infections and is considered one of the greatest challenges for healthcare institutions. Daily care is required for hand hygiene, as well as for the handling of materials, equipment, medications, and the overall environment. Objective: How is the equipment designed for preventing hospital-acquired infections used? Describe the instrument and its use in the Bone Marrow Transplantation Unit, focusing on compliance with daily actions necessary to reduce the risk of hospital-acquired infections.

Method: Data collected through experience report conducted at an oncology hospital in southern Brazil from March 2022 to May 2023.

Results: Several guidelines were provided regarding the daily care practices that should be adopted, but the compliance rate remained the same during technical visits conducted by the Hospital Infection Control Committee. Therefore, in March 2023, an instrument was developed, which included topics related to nursing station hygiene and organization; storage of materials and multi-dose medications in the central supply area; cleanliness and organization of equipment; necessary precautions for patients in contact isolation; care for indwelling urinary catheters; organization of the disposal area; validity of the High Efficiency Particulate Air (HEPA) filter; appropriate facility structure; and presence of food in unauthorized zones, among many others. The nurse from the unit is responsible for daily completion of the instrument, documenting the compliance with each item. The percentage of compliance within the unit before the creation and use of the instrument was as follows: 71% (March 2022), 68% (May 2022), 68% (February 2023), and 73% (March 2023). After implementing the instrument, the compliance rate increased to 94%, with a 24% reduction in non-compliance. The only area identified for further improvement was the expiration of materials in the central supply area.

Conclusion: The instrument for daily evaluation by the team itself promoted an understanding of the importance of each component, and the daily monitoring provided an opportunity for improvement within the unit through the engagement of all involved personnel. Technical visits became a routine necessity.

Keywords: Hospital-Acquired Infection. Instrument. Oncology Nursing. Nursing Care.

HEPATIC MUCORMYCOSIS IN AN ALLOGENEIC HEMATOPOIETIC STEM-CELL TRANSPLANT RECIPIENT: CASE REPORT AND LITERATURE REVIEW

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Introduction: Mucormycosis is an invasive fungal infection. Especially in hematopoietic stem-cell transplant (HSCT) patients, it is characterized by violent evolution with angioinvasion, tissue infarction and necrosis. Usually, the main manifestations are pulmonary involvement and the rhino-orbital-cerebral syndrome. Isolated hepatic involvement is rare. Objectives: report a hepatic mucormycosis case in a patient post-allogeneic HSCT and to present the review of the literature.

Methods: description of a case of the Bone Marrow Transplantation unit of the HC-FMUSP. The fungus species was identified by sanger sequencing of the regions 18S rRNA, ITS1, 5.8S rRNA, ITS2 and 28S rRNA. We reviewed dados MedLine, Embase, SCOPUS, LILACS and Web of Science data bases for full text of hepatic mucormycosis reports.

Results: A 36-year-old man underwent an allogeneic HSCT. He was admitted to our hospital for treatment of acute graft-versus-host disease of the gastrointestinal tract in D+43 after transplantantation. Methylprednisolone and etanercept were started. He was under prophylaxis with acyclovir, trimethoprim-sulfamethoxazole and posaconazole 600mg/day. During hospitalization in D+132, he developed bacterial pneumonia complicated with pleural effusion. He was treated with piperacillin-tazobactam and pleural drainage. In the radiological control, it was observed a peripheral hepatic nodule in the right lobe of 2.5 cm, suspicious for abscess. A magnetic resonance image (MRI) of the abdomen was performed, demonstrating liver of normal dimensions and regular contours, with a 3.2-cm heterogeneous lesion content forming a liquid level in segment VIII, associated diffusion restriction and thickening with parietal hyper-enhancement, compatible with liver abscess. There are other smaller formations of the same nature, a 1,2-cm the largest in segment IV. The antibiotic regimen was changed to vancomycin and imipenem. A puncture of the liver abscess was performed, and numerous fungal hyphae were visualized in the aspirate suggesting the diagnosis of mucormycosis. Lipossomal amphotericin B was started at 10 mg/kg every 24 hours. After a month of antifungal treatment, the patient evolved with sudden clinical deterioration. The patient died approximately 5 months after his initial admission. Posteriorly, Mucor sp. Was identified in the culture of the aspirate. The sequencing was compatible with Mucor indicus (Genbank: Mucor indicus IFM 60797 partial and complete sequence – Identity 97.05% Acession number LC390229.1). In the literature review we found 24 cases of hepatic mucormycosis. Eleven of them were related with oncohematological malignancies. Ten of the 24 patients (41.6%) died.

Conclusion: hepatic mucormycosis is a rare manifestation of invasive fungal diseases with high lethality rate in immunocompromised patients. Sequencing is crucial for the correct antifungal treatment.

Keywords: mucormycosis; hematopoietc stem-cell transplantation; invasive fungal infections.

IMPACT OF IN LOCO TRAINING TO REDUCE CASES OF CLOSTRIDIOIDES DIFFICILE INFECTION IN ONCO-HEMATOLOGY PATIENTS AND HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Clostridioides difficile infection (CDI) has become a major cause of morbidity and mortality, with approximately 476,000 infections per year in the United States and caused 190,000 healthcare-associated infections (HAI) in Europe. The transmission of CDI in health facilities is strongly associated with the hands of professionals and the environment. It is the main cause of infectious diarrhea in hospitalized patients, especially in onco-hematology and Hematopoietic stem cell transplantation (HSCT), mainly allogeneic. Some studies show rates greater than 25% of positivity in this group.

Objective: To evaluate the impact of training playful In loco on CDI prevention measures in onco-hematology and HSCT units.

Casuistic: All patients admitted to Onco-hematology and HSCT Units from August 2022 to May 2023.

Methods: Retrospective, quasi-experimental study with intervention. Performed in the onco-hematology and HSCT units of a tertiary private hospital in São Paulo, Brazil. The study period was in the pre-intervention between August and December 2022, and post-intervention between January and May 2023. An increase in cases of CDI was observed in both Units. It was appointed whether patients had been submitted to HSCT, and whether they had neutropenia at the time of infection. Training was prepared as in loco application for nursing, medical, physiotherapy, nutrition and hygiene teams, and consisted of paired cards in memory game format with information regarding measures to prevent transmission of suspected and confirmed CDI, such as: washing hands with soap and water, cleaning the environment with a chlorine-based product, identifying the bed with an isolation plate, type of precaution, correct route of antibiotic administration, what to do with a patient with more than 3 episodes of diarrhea within 24 hours, time of withdrawal precaution and other measures. The collaborators needed to turn the cards over and, if the collaborator did not find the answer, a moment was held with the team to clarify doubts.

Results: Observing the CDI indicators in the onco-hematology and HSCT units in the pre-intervention period, we detected an increase in cases between August and December 2023 (7 cases), with incidence density (number of cases divided by the number of patients day x 100) of HAI by CDI of 0.5% in August, 1.6% in September and 1.3% in December. A total of 6 patients underwent HSCT, 3 (42.9%) Autologous, 3 (42.9%) Allogeneic. Six (85.7%) patients were neutropenic during the infection. In the post-intervention period, there were no new cases of CDI reported for these units.

Conclusion: A higher number of cases of CDI was observed in patients HSCT and during neutropenia period. An in loco training was able to interrupt the local transmission of the microorganism, demonstrating that oriented health professionals contribute to a better assistance and consequent reduction of infection rates.

keywords: Bone marrow transplantation, Clostridioides difficile, Playful training, onco-hematology, HSCT, CDI.

INFECTION CAUSED BY SPHINGOMONAS PAUCIMOBILIS IN A PATIENT WITH HEMATOPOIETIC STEM CELL TRANSPLANTATION: AN EMERGING INFECTIOUS AGENT ASSOCIATED WITH HEALTH CARE

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Introduction: Non-fermenting Gram-negative bacilli are the most common cause of nosocomial infections, especially in the environment of immunosuppressed patients. The genus Sphingomonas contains at least 12 species, of which only S. paucimobilis is considered a human pathogen. Historically, this species was considered of minor clinical importance, however, it has gained importance due to the increase in the frequency of cases found in the literature. Most cases have a favorable evolution, however, there are descriptions of unusual infections, both invasive and severe, such as pseudobacteremia, septic arthritis and osteomyelitis. Risk factors for this infection most commonly include malignancy, use of immunosuppressants, and diabetes mellitus. There are also reports of primary bacteremia and catheter-related bloodstream infection. The most effective antibiotics are fluoroquinolones, carbapenems, and beta-lactam/beta-lactamase inhibitor combinations. Resistance to first- and second-generation penicillins and cephalosporins is commonly encountered.

Objetive: Related a case report of the patient post transplanted with infection by Sphingomonas sp.

Results: E.M.P, 56 years old, female, previously with hypothyroidism and fibromyalgia, diagnosed with Multiple Myeloma light chain Kappa, R-ISS = 2, ISS = 2, DS = 1, after outpatient investigation of pain in the lumbar spine. He had osteolytic lesions in the costal arches and lumbar spine, evidenced by tomography and magnetic resonance imaging, hypercalcemia, and had medullary analysis results compatible with the diagnosis in November 2022. She started treatment with DaraVTD regimen for three cycles, when in the fourth cycle Lenalidomide was introduced instead bortezomib and thalidomide due to grade III peripheral neuropathy. After restaging and confirmation of a very good partial response, the patient started autologous hematopoietic stem cell transplantation (HSCT) with Mel200 conditioning in April 2023 for consolidation. Evolved with oral mucositis, fever and neutropenic colitis, requiring treatment with antimicrobials and already using prophylactic antifungal. Cefepime was initially chosen, however, due to persistent fever, treatment was escalated to Meropenem and anidulafungin. Sphingomonas paucimobilis bacteria were identified in blood cultures, and treatment with carbapenem was maintained until bone marrow and clinical recovery.

Conclusion: S. paucimobilis can cause infections in both healthy and immunocompromised individuals. Although it is an organism of low clinical virulence, the infection caused by S. paucimobilis can lead to septic shock. Therefore, environmental surveillance, evaluation of invasive devices, cultures and appropriate antimicrobial therapy are encouraged, especially in neutropenic patients and patients with comorbidities, including patients undergoing hematopoietic stem cell transplantation.

Keywords: Sphingomonas paucimobilis, HSCT, bacterial infection, bone marrow transplantation.

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LETERMOVIR TO PREVENT CYTOMEGALOVIRUS (CMV) REACTIVATION IN HIGH-RISK PEDIATRIC PATIENTS UNDERGOING ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT)

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Introduction: CMV represents the main viral complication post-HSCT. Letermovir (LTV) is approved for CMV prophylaxis in CMV-seropositive allogeneic HSCT adult recipients, reducing its rates and the transplant-related mortality. Most pediatric patients in developed countries are CMV negative, leading to little commercial interest of LTV studies in this age group. The children in developing countries are less likely to have an HLA-matched donor, undergo higher infectious risk HSCT and have a higher CMV seroprevalence. The only option to treat these patients is ganciclovir, which is associated with hematological toxicity, increased chance of breakthrough infections and death.

Objective: To describe the use of LTV in children undergoing high-risk allogeneic HSCT. Casuistic: Between December 2021 and May 2023, 21 children received LTV in a single institution and were included in this analysis.

Method: Patients < 21 years of age with a high-risk of developing CMV disease due to haploidentical HSCT or seropositive recipient, and patients with early CMV reactivation, received primary or secondary prophylaxis, respectively. Daily dose ranged according to weight: <20Kg:120mg (or 240mg every 48 hours), 21-30Kg:240mg, >31Kg:480mg. Dose was not reduced in patients using cyclosporine, although all concomitant drugs were screened for interactions. Prophylaxis with acyclovir for reactivation of herpes simplex was continued in HSV IgG positive recipients. Weekly CMV PCR was performed in all patients at least up to D+100. Detection limit was 34 IU/ml. LTV was paused whenever ganciclovir was introduced and restarted upon completion. Possible adverse events were documented.

Results: The aspects of patients and transplants are described in Table 1 and of treatment in Table 2. Five patients (24%) received secondary prophylaxis. The median day of start was on D+5 and of discontinuation was D+119. Routine CMV PCR was continued beyond D+100 in most patients, on average for 2 months, or whenever a CMV infection was clinically suspected. None of the 21 patients had breakthrough CMV, neither reactivation, nor disease. Twelve patients (57%) had LTV paused to treat HHV6 or HHV7 reactivation. Five patients (24%) had a low positive CMV PCR during the use of LTV (maximum 266 IU/ml) but it resolved without any specific therapy. Eight patients had acute GVHD (38%) and five (24%), chronic GVHD. Sixteen children are alive, 2 died of transplant related toxicity and 3 of progressive disease. Median follow-up time was 232 days (29-522). There was no drug discontinuation due to adverse events.

Conclusion: Using LTV is effective and well tolerated as CMV prophylaxis in pediatric patients. Subclinical reactivation on antiviral prophylaxis is not uncommon, 24% in our study but it resolved without changing the antiviral prophylaxis. LTV use was frequently interrupted to treat HHV6 reactivations, that were not prevented by LTV.

TABLE 1. Demographics of the pediatric patients receiving letermovir

Characteristics (n=21)	Number (%)
Age – median (range)	11 (3-20 years)
Female sex	7 (33%)
Median weight – Kgs (range)	34 (12-50)
Underlying disease	
Malignant disease*	17 (81%)
Non-malignant disease**	4 (19%)
Cytomegalovirus IgG serostatus	
Recipient positive/donor positive	16 (76%)
Recipient positive/donor negative	5 (24%)
HLA-matching and donor type	
Matched sibling donor	0
Matched unrelated donor	5 (24%)
Haploidentical donor	16 (76%)
Graft	
Bone marrow	16 (76%)
Peripheral blood stem cells	5 (24%)
GVHD prophylaxis during LTV use	
Tacrolimus	7 (33%)
Cyclosporin A	11 (52%)
Sirolimus	3 (14%)
Neutrophil engraftment - day post-HSCT (range)	18 (14-27)
GVHD	
Acute grade I/II	7 (33%)
Acute grade III	1 (5%)
Mild chronic	2 (10%)
Moderate chronic	3 (14%)
Discontinuation of all immunosuppression - day post-HSCT (range)	114 (50-496)

*9 Acute lymphoblastic leukemia; 2 Neuroblastoma; 6 Acute myeloid leukemia or myelodysplastic syndrome **2 Sickle cell disease; 1 Chronic granulomatous disease;1 Hemophagocytic lymphohistiocytosis

TABLE 2. Letermovir treatment details

Characteristics (n=21)	Number (%)
Start of letermovir - day post-HSCT (range)	11 (3-20)
Primary CMV prophylaxis	16 (76%)
Route of administration	
Nasogastric/enteral tube	15 (71%)
Oral	6 (29%)
Treatment of CMV reactivation during letermovir	0
Discontinuation due to intolerance	0
Treatment still ongoing at the time of this report	7 (33%)
Treatment completed	14 (67%)
Follow-up after completion of LTV treatment – days (range)	178 (10-401)
Treatment length - day post-HSCT - median (range)	119 (29-407)
Increase in CMV viral load without change in treatment	5 (24%)
Maximum viral load – UI/ml (n=5)	266

PREEMPTIVE RITUXIMAB FOR EBV REACTIVATION AFTER HCT IN TIMES OF COVID-19: IS IT REALLY NECESSARY?

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Background: The cumulative incidence (CI) of Epstein–Barr virus (EBV) reactivation after HCT can be as high as 60%. Although rare (1.2%-13%), post-transplant lymphoproliferative disorders (PTLD) can have a mortality rate greater than 30%. Prospective monitoring of EBV DNAemia and preemptive rituximab have been recommended in HCT recipients at increased risk of developing PTLD. However, recent studies show a poor response to COVID-19 vaccine (19%) in patients (pts) who received rituximab up to 12 months before vaccination. As no cut-off of EBV DNAemia is established for preemptive therapy, many pts may possibly being treated with rituximab unnecessarily, which may affect vaccine responses and the course of COVID-19.

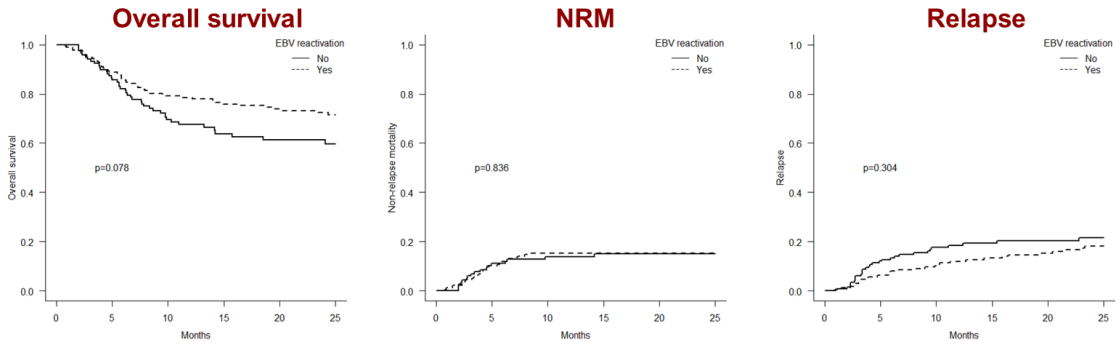
Methods: We reviewed the EBV-related outcomes in high risk allogeneic recipients (MUD, MRD with mismatch and haploidentical) transplanted from 2017 to 2021. Detection of EBV DNAemia was performed weekly up to d120, by qPCR (Master kit for EBV quantification, Mobius Life Science, Pinhais, Brazil). EBV viral load (VL) was prospectively followed-up by TID doctor and the lab team. Whenever a VL increase of ≥ 1log within one week was detected, a WhatsApp alert was sent to the HCT team that promptly started IS reduction and EBV workup (end-organ disease and images). Rituximab was introduced in the case of EBV end-organ disease, PTLD or if no response to IS reduction. EBV reactivation, non-relapse mortality and relapse were estimated by cumulative incidence. Overall survival was estimated by Kaplan Meyer method.

Results: 328 allo-HCT were included. The CI of EBV DNAemia was 54.6% (49-59.9%). 178 pts (64 haplo 37.2%; 114 MUD 73.1%, p<0.0001) had EBV reactivation at a median of 53 (3-439) days. Only 13 pts (7.3%) used rituximab, 5 due to EBV encephalitis and 8 due to no response to IS reduction. No patient developed PTLD. The median duration of EBV DNAemia was similar in pts with or without rituximab (41 vs 56 days, p=0.24), but not the median viral load (78,232 vs 11,450 cp/mL, p=0.0001). The variables significantly associated with EBV reactivation were MUD HCT and source of stem cells (PBSC). The rituximab restrictive policy adopted in our center did not impact significantly the overall survival (p=0,078), non-relapse mortality (p=0,836) and relapses (p=0,304).

Conclusions: MUD HSCT posed the highest risk for EBV reactivation. EBV encephalitis was the most frequent EBV end-organ disease (2.8%). The sudden increase of EBV DNAemia is a better biomarker for EBV-related complications than the persistence of viremia. Although preemptive rituximab is recommended in high risk pts, IS reduction was enough to control most of the episodes of EBV reactivation, with no impact on OS, relapses and NRM. In times of COVID-19, rituximab should be restricted to patients who have not responded to the IS reduction or developed EBV related complications.

FIGURE 1. OS, NRM and relapses according to EBV reactivation (N=296*)

Figure 1. OS, NRM and relapses according to EBV reactivation (N=296*)



Disclosure: Nothing to declare
Source funding: None

PULMONARY MUCORMYCOSIS IN A PATIENT DIAGNOSED WITH MULTIPLE MYELOMA/AL AMYLOIDOSIS 14 MONTHS AFTER AUTOLOGOUS BMT: A CASE REPORT 1

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Introduction: Mucormycosis is an opportunistic invasive infection caused by fungi of the Mucorales order. Transmission is mainly by inhalation of spores from the environment. Most patients have risk factors such as diabetes mellitus, hematological malignancies, previous transplant, use of corticosteroids or immunosuppressants. The disease can spread rapidly locally and spread to vessels and cause infarction and necrosis of the sinuses, lungs, stomach and others.

Objective: To report a case of Pulmonary Mucormycosis in a patient diagnosed with Multiple Myeloma associated with AL Amyloidosis previously submitted to autologous bone marrow transplantation. Raise awareness to the importance of including invasive fungal disease in the differential diagnosis of transplanted patients, even those with in remission and outside the transplant aplasia period, especially among corticosteroid users.

Methods/ Results: Case report. A 48-year-old male patient diagnosed with Multiple Myeloma IgG/ lambda ISS 1 , DS 1 associated with AL Amyloidosis diagnosed more than 4 years ago, having achieved complete response after 6 cycles of VCD and consolidation with autologous Bone Marrow Transplantation (BMT). On maintenance lenalidomide. Evolved with adrenal insufficiency after transplantation, using prednisone 5-10mg/day. About 14 months after BMT, he developed a productive cough with yellowish secretion, prostration and dyspnea on exertion with a 10-day evolution, refractory to an initial course of oral antimicrobials. On examination with bilateral pulmonary crackles and stable vital signs. Chest CT scan with opacities in the lower lobes and consolidation in the middle lobe with a ground-glass halo. Negative serum galactomannan. Voriconazole was started due to suspected aspergillosis, however culture for fungi in bronchial lavage isolated Rhizopus spp, determining the diagnosis of pulmonary mucormycosis. Infectology team suggested switching to oral isovuconazol 200mg/day. Lenalidomide was discontinued. The patient evolved with an excellent clinical response, completely resolving the symptoms after about a month of taking the medication. Complained of diarrhea, vomiting and headache associated with its use, well managed with symptomatics. CT's with partial response after 2 months and total after 4. The patient is being followed up by the infectologists team. He continued to use isovuconazol for the moment as recommended, given the need to maintain the steroids. Weaning will be done on an outpatient basis.

Conclusion: Transplanted patients are exposed to the risk of invasive fungal disease even without high-intensity chemotherapy. In this case, corticosteroid therapy and the use of lenalidomide may have been determinant for the risk of mucormycosis. The index of suspicion must be high, especially in infected patients whom do not respond to the first measures taken. Early and multidisciplinary treatment can be decisive for a good clinical outcome.

IMAGE 1 - Chest CT at diagnosis

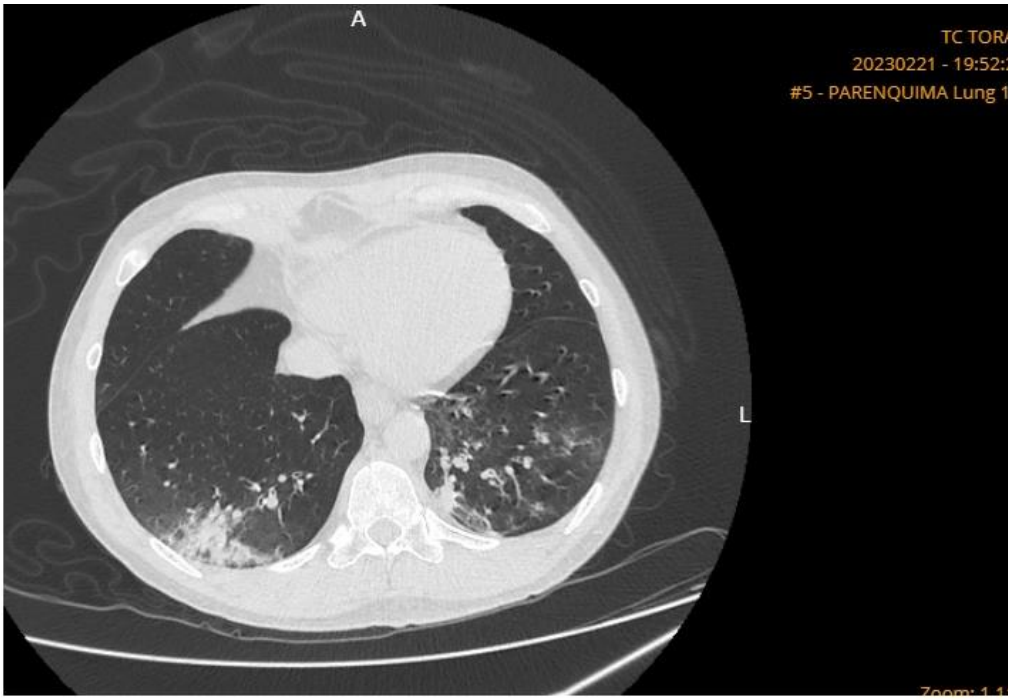
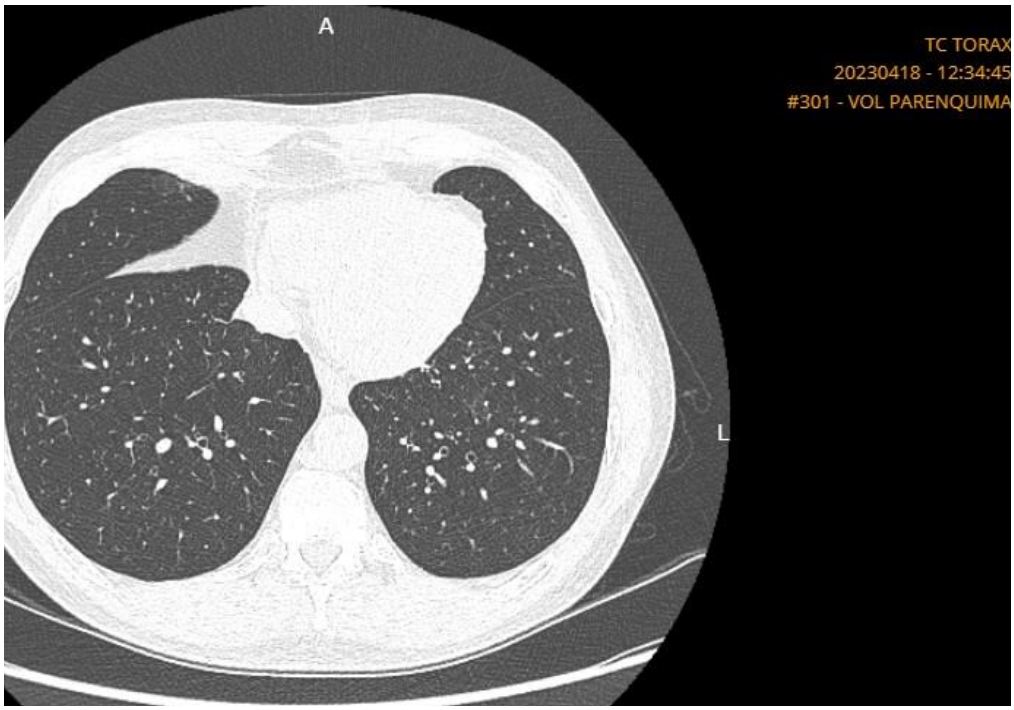


IMAGE 2 - Chest CT 2 months after treatment



UNCOMMON DEMATIACEOUS INFECTION IN THE CENTRAL NERVOUS SYSTEM OF A POST ALLOGENEIC STEM CELL TRANSPLANT PATIENT: A CASE REPORT

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Introduction: Aureobasidium pullulans is a dematiaceous black yeast-like fungus. It is an uncommon pathogen that affect mainly immune-compromised hosts. Although rare, it has been reported to cause a variety of localized infections.

Objective: to report a case of central nervous system infection by Aureobasidium pullulans var melanogenum in a post allogenic hematopoietic stem cell transplant (HSCT) patient.

Case description: A 17-year-old female with B-cell acute lymphoblastic leukemia underwent an allogeneic HSCT from an HLA-identical sibling. Conditioning regimen consisted of cyclophosphamide and total body irradiation (12 Gy). Graft versus host disease (GVHD) prophylaxis was initiated using methotrexate and cyclosporine A. The patient experienced recurrent episodes of acute and overlapping chronic GVHD, requiring immunosuppression with high doses of corticosteroids and corticosteroid-sparing agents.

In April 2023, 1 year and 5 months after HSTC, the patient presented to the emergency department due to decreased level of consciousness. Although clinical improvement after broad spectrum antibiotics, she continued to exhibit behavioral alterations. A magnetic resonance imaging of the brain revealed thalamic lesion with ring enhancement, measuring 11x9x15m (negative findings: PCR for toxoplasmosis, Chagas and free living amoebae, serology for cysticercosis). A cerebrospinal fluid (CSF) analysis was conducted, and Aureobasidium pullulans was identified. The patient was treated with amphotericin B for 36 days, resulting in a reduction of the thalamic lesion.

For identification of the pathogen, the CSF sample was initially cultured, and after four days, creamy colonies covered with a viscous exudate were observed, which later turned black. Microscopic analysis revealed budding cells that resembled yeast-like fungi, with the appearance of thin septate hyphae that became thicker and darker with culture aging. Additional tests were conducted for genus and species confirmation. MALDI-TOF mass spectrometry was performed using a Byotyper Microflex instrument (Bruker), and the mass spectrum was compared on the online MSI platform at https://msi.happy-dev.fr. The identification for Aureobasidium melanogenum yielded a first score of 20.35% and a second score of 20.84%. Partial gene sequencing of 18S, ITS1, 5.8S, ITS2, and a portion of the 26S ribosomal RNA coding gene showed a 97.98% genetic identity with other Aureobasidium pullulans sequences in the UNITE database. Comparison with the GenBank database using the Blast tool revealed a 99.64% genetic identity with another Aureobasidium pullulans sequence.

Discussion: This case highlights the importance of recognizing infections caused by uncommon agents in patients undergoing intense and prolonged immunosuppression associated with the HSCT and GVHD. In addition, diagnostic methods played a crucial role in the detection and accurate identification of Aureobasidium pullulans infection.

NON-INFECTIVE COMPLICATIONS

CARDIAC ALTERATIONS RELATED TO THE USE OF CYCLOFOSFAMIDE IN PATIENTS UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: The expansion of hematopoietic stem cell transplantation (HSCT) in recent decades has enabled advances in the treatment of diseases that, in the past, were constantly lethal. To start the transplant process, the patient receives chemotherapy and/or radiotherapy to eradicate the underlying disease. Among the drugs used in conditioning, cyclophosphamide stands out. Characterized as an alkylating agent with immunosuppressive properties, as evidenced by its use as a conditioning agent, it causes lymphodepletion for T-cell therapy and GVHD prophylaxis for hematopoietic stem cell transplantation.

Objective: To describe cardiac alterations related to the use of cyclophosphamide in patients undergoing hematopoietic stem cell transplantation.

Method: This is an analytical, retrospective cross-sectional study about hematopoietic stem cell transplants in which Cyclophosphamide was used in high doses, with potential cardiotoxicity, during treatment. Study conducted at a Bone Marrow Transplant Institute of a large hospital in the State of Minas Gerais. Data were collected from electronic medical records during the period from May 2019 to May 2022. For data analysis, the statistical package Statistical Software for Professional (Stata), version 17.0, was used. Approved by the Research Ethics Committee under opinion number 5,732,086 (CAAE: 63061222.0.0000.5138).

Results: A total of 52 transplants were performed from March 2020 to May 2022. The age range ranged from 18 to 66 years, median of 33 years, 65.3% were male and mostly lived (53.8%) outside of the metropolitan region of Belo Horizonte. The most prevalent diagnosis was Acute Lymphoid Leukemia (35.19%) and Acute Myeloid Leukemia (27.78%). As for the type of HSCT performed, Haploidentical stands out with 67.3% and followed by Allogeneic Related 21.1%. The source of collection of hematopoietic stem cells was bone marrow aspiration (53.8%). The main regimen used was Busulfan and Fludarabine (36.5%). Of the 52 transplants performed, the cardiac complications described were hypertension, hypotension, bradycardia, tachycardia and chest pain. Half of the patients during the hospitalization period had to be transferred to the ICU due to decompensation of the clinical condition. Among the transfer reasons, cardiac/respiratory complications stand out (80%). Outcome: 28 (54.9%) died and 23 (45.1%) were discharged

Conclusions: This study demonstrated the presence of cardiac alterations related to the use of cyclophosphamide in patients undergoing hematopoietic stem cell transplantation, which, as it is not a rare event, demonstrates the need to carry out a pre-transplant cardiac safety profile, in addition to implementing measures cardioprotective measures throughout the therapeutic plan.

Keywords: Bone Marrow Transplantation . Cyclophosphamide. Chemotherapy

CLINICAL OUTCOME OF CYCLOPHOSPHAMIDE USE IN PATIENTS UNDERGOING HAPLOIDENTICAL HEMATOPOIETIC STEM CELL TRANSPLANTATION AS A PREVENTION FOR GRAFT-VERSUS-HOST DISEASE

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Introduction: Haploidentical hematopoietic stem cell transplantation (HSCT) is performed in the absence of related or unrelated HLA-identical donors. To face the challenge of partial incompatibility, there are currently immunosuppression protocols in use, commonly used in post-transplant regimen Cyclophosphamide (Cy), Cyclosporine (CSA) and Mycophenolate Mofetil (MMF), which aims to reduce the incidence of Graft Versus Host (GVHD).

Objective: To describe the clinical outcome of patients undergoing haploidentical hematopoietic stem cell transplantation who used CY as prevention for graft-versus-host disease.

Method: This is an analytical, retrospective cross-sectional study about patients who underwent haploidentical HSCT, and used post-transplant CY as part of the GVHD prophylaxis scheme. Approved by the Research Ethics Committee under opinion number 5,732,086 (CAAE: 63061222.0.0000.5138).

Results: 33 transplants were performed from March 2020 to May 2022, using CY as prophylaxis for GVHD. The age group varied between 18 and 66 years old, with a median of 36 years old, 72.7% were male and the majority (62.5%) lived outside the metropolitan region of Belo Horizonte. The most prevalent diagnoses were AML (36.4%) and ALL (33.3%). Of the 33 transplants, 20 (60.6%) had medullary grafting confirmed, in the other cases (39.4%) there was primary graft failure, secondary graft failure and/or early death before the period of medullary grafting. Of these 20 transplanted patients with confirmed spinal cord attachment, 10 patients evolved with acute GVHD (50%) and six patients (30%) evolved with chronic GVHD. The main organs affected were: skin, mouth, liver and gastrointestinal tract. Four patients (40%) had more than one organ affected by GVHD. The source of collection of hematopoietic stem cells from patients who developed acute GVHD were 50% for bone marrow aspiration and for collection of peripheral stem cells and chronic GVHD were bone marrow aspiration (33.3%) and for collection of peripheral stem cells (66.7%). Outcome: 5 patients affected by acute GVHD (50%) died, two patients (20%) had graft loss and one patient (10%) had disease recurrence. Of the patients who evolved with chronic GVHD, three patients (50%) died and 3 patients (50%) were discharged.

Conclusions: The study sought to collect data on the incidence of GVHD in the group submitted to this prophylaxis regimen at the Service, and showed a high rate of acute GVHD (50%) and chronic GVHD (30%) in comparison with the literature. Among the patients who evolved with chronic GVHD, it may be associated with the choice of Hematopoietic Stem Cell collection source, making it necessary to carry out a study to verify if there are correlations.

Keywords: Haploidentical transplantation. Cyclophosphamide. Graft Versus Host Disease

DOUBLE BONE MARROW TRANSPLANTATION IN A PATIENT WITH SIGNIFICANT WEIGHT GAIN: A REPORT OF CASE

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Introduction: Haploidentical allogeneic bone marrow transplantation is an extremely complex procedure that consists of the transfer of hematopoietic stem cells from a donor with 50% match to a recipient who has a pathological or inefficient bone marrow. Bone marrow transplantation can be performed fresh or cryopreserved when the marrow is preserved via freezing with the aid of the preservative dimethylsulfoxide (DMSO). For the success of the procedure, it is necessary that the receiver is submitted to a conditioning composed of high doses of chemotherapy and, in some cases, radiotherapy that aim to inactivate the receiver's medulla. The procedure has many risks, both for the recipient and the donor. The volume of stem cells to be collected from the donor must be proportionally related to the recipient's body surface and also to the donor's marrow cellularity, which consists of the amount of stem cells present in the collected marrow. To identify the body surface, a calculation is performed using the weight and height of the receiver.

Objective: To identify the effectiveness of double bone marrow transplantation, fresh and cryopreserved from the same donor, as a solution when the recipient presents significant weight gain.

Method: This is a report of a rare case in which a patient with an indication for allogeneic haploidentical hematopoietic stem cell transplantation with a brother presented significant weight gain in the pre-transplantation period.

Results: The recipient had his anthropometric measurements taken 15 days before the date of bone marrow collection, weighing 77 kg. On the day of hospitalization for the transplant, the patient weighed 97 kilograms, with a weight gain of 20 kilograms or an increase equivalent to 26% of his weight, between the interval between the pre-hospitalization consultation and hospitalization for the transplant . Such weight change drastically influenced his body surface. The level of cellularity of the collected bone marrow was immediately evaluated, where the insufficient volume of cells to guarantee the safety of the procedure was evidenced. It was decided to carry out a new medullary mobilization in the donor and perform a collection of stem cells by peripheral access. On the day of transplantation, the infusion of cryopreserved cells was performed and immediately after the end of the infusion, fresh cells were infused. The transplant was uneventful and neutrophilic attachment was confirmed 19 days after cell infusion.

Conclusion: Double bone marrow transplantation proved to be a viable alternative in situations such as weight gain. However, factors such as donor availability are issues that make this solution fragile in some cases.

Keywords: Bone marrow transplantation. Bone marrow. Bone Marrow Diseases.

NEOVAGINA CONSTRUCTION WITH CUTANEOUS GRAFT IN A PATIENT WITH VAGINAL SYNECHIA SECONDARY TO GRAFT DISEASE VERSUS CHRONIC VAGINA HOST

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Introduction: chronic graft versus host disease (GVHD) is a complication observed after Allogenic Bone Marrow Transplantation and can bring serious reduction in the patient's quality of life, in addition to subjecting them to the risk of death.

Objective: to report the case of a patient who undergoed Allogenic Bone Marrow Transplantation for Lymphoma in 2014 whose conditioning was carried out with bulflumel protocol, GVHD prophylaxis with Cyclosporin and Mycophenolate. Evolving with Graft Disease versus Chronic skin, mouth, eye and vaginal mucosa host. She undergoed treatment with systemic corticotherapy and phototherapy with stabilization of the cutaneous lesions; and, despite the topical therapy applied with estrogen, she had progression of the vaginal disease, developing to almost total synechia.

Method: the patient undergoed vaginal synechia lysis and neovagina reconstruction using cutaneous graft from the patient's own medial thigh. Results: the patient evolved in the late post-operative evolution with improvement in quality of life and functional vagina, also reporting improvement in the female sexual satisfaction questionnaire.

Conclusion: although Graft versus Host Disease is a post-transplant complication that can bring a strong negative impact on patients lives, there are currently innovative techniques that allow to improve the quality of life of these individuals.

Keywords: Graft-host disease. Bone marrow transplant. Skin transplant.

STRATEGIES FOR PREVENTION AND TREATMENT OF GRAFT-VERSUS-HOST-DISEASE - A SYSTEMATIC REVIEW

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Individuals who receive hematopoietic stem cell transplants (HSCT) from unrelated donors may develop different forms of graft-versus-host disease (GvHD), both acute and chronic, in which immune cells from the donor attack the recipient's tissues. The primary treatment for this condition is based on the use of steroids; however, patients with severe and resistant cases have limited therapeutic options and an unfavorable prognosis. Mesenchymal stromal cells (MSCs), which are known to exhibit immunosuppressive properties, are undergoing clinical trials to evaluate their safety and efficacy in the treatment of various immune-mediated disorders. GvHD is one of the first health conditions where MSCs are being clinically applied. The aim of this study was to make a literature review about current strategies for prevention and treatment for the GvHD. We made a search in the databases PubMed, Cochrane, BVS and Scielo using the keywords Transfusion Reaction, Immunotherapy, Graft vs Host Disease, only original papers published between 2018 and 2023 were included. After hematopoietic stem cell transplantation (HSCT), GvHD is a major cause of morbidity and mortality, affecting 8% to 85% of pediatric transplant recipients. However, in the cases that GvHD is steroid-refractory, there is no established treatment. Nowadays, immunotherapy has emerged as a promising approach for the treatment of various diseases, including GvHD. Immunotherapies aim to modulate or suppress the dysregulated immune response associated with GvHD. Among the investigated immunotherapy strategies, cellular therapies are noteworthy, especially with MSCs, which are multipotent cells with immunomodulatory and regenerative properties that have shown potential to suppress the exacerbated immune response in GvHD. They can modulate immune system cells, control inflammation, and promote tissue regeneration. Furthermore, MSCs have the advantage of being easily obtained from various tissues. The main organs affected by transfusion reactions are the skin, liver, and intestines. These immune reactions can cause acute inflammation followed by chronic tissue injuries. Another treatment approach is extracorporeal photopheresis (ECP). This involves the ex vivo collection of peripheral mononuclear cells, followed by exposure of these cells to a photosensitizing agent and ultraviolet-A radiation, and finally, reinfusion of the treated cells into the patient. Another experiment, still only in mice, involves the modulation of T cells. Current recommendations are based only on retrospective or observational studies. Further research, multicenter research trials, and funding for these assays will be necessary. If treatment decisions based on clinical data favor ECP, transplant recipients' patients should be carefully monitored to detect beneficial and harmful effects.

MULTIDISCIPLINARY

NURSING

ALLOGENEIC HEMATOPOETIC STEM CELL TRANSPLANTATION: NURSING GUIDELINES IN HOSPITAL DISCHARGE FOCUSING ON PATIENT SAFETY

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a complex procedure, with several steps, and post-transplantation care is essential for the promotion and maintenance of the patient's health. Nursing care for this patient profile requires technical knowledge and skills specific to each phase of HSCT[1]. Educational information for patients and their caregivers is complex, and adequate understanding can have repercussions on HSCT results[2]. In this context, nursing guidelines for discharge are characterized as an essential work tool to assist in a favorable evolution in the immediate post-HSCT period.

Objective: To describe the nursing guidance process at patient discharge after allogeneic HSCT.

Method: This is an experience report of nurses in a Protected Environment Unit (PEU) of a University Hospital in the south of the country.

Results: At the PEU, the guidance process for discharge occurs systematically and starts early. The interdisciplinary team meets on a weekly basis to discuss the case of each hospitalized patient and their expected discharge date. Once the prevision for a brief discharge has been identified, the nursing staff begins the formal guidance process, delivering a printed folder with all the precautions to be followed by the patient at home. At another time, the nurse responsible for the patient retrieves the information through the complete reading of the material with the patient and his caregiver, if he is present during hospitalization. The guidelines highlight signs/symptoms of alterations and their severity that may occur at home and the measures to be taken. Adaptations to this process are carried out according to the patient's characteristics, causing the guidelines to be elaborated individually and according to the patient's needs. After carrying out the instructions, telephone contact is made with the Day Hospital nurse to transfer the plan care, informing him about the case and the main complications, as well as the important aspects for the continuity of treatment.

Conclusions: Allogeneic HSCT is a procedure that begins prior to patient hospitalization, with pre-HSCT guidelines, and extends after discharge, aiming at controlling the risk of infections or other complications, such as graft-versus-host disease (GVHD). Considering the reported process, it is understood that the nursing guidelines for discharge are a fundamental tool in the prevention of post-HSCT complications, and that the early initiation of this process contributes to better patient adherence to the guidelines provided and the suggested adaptations.

Keywords: Bone marrow transplant. Nurse educator. Patient safety.

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CARRYING OUT A PDCA CYCLE FOR THE MANAGEMENT AND AWARENESS OF THE NURSING TEAM WORKING IN A HEMATOPOETIC STEM CELL TRANSPLANTATION UNIT IN THE PREVENTION OF PRIMARY BLOOD STREAM INFECTION (PCI) RELATED TO HEALTH CARE

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Introduction: The continuous improvement of the quality of care requires systematic evaluations of the care provided to patients in order to identify the factors that interfere in the work process of the professionals involved in the care. Prevention of healthcare-associated bloodstream infection in patients undergoing HSCT is a major challenge due to the presence of severe impairment of the immune system. The intravascular device breaks the mechanical barrier of the skin, favoring the penetration of microorganisms directly into the bloodstream. The nursing team is primarily responsible for the prevention and control of primary bloodstream infection. It is the professional category that most handles intravenous devices and is responsible for their daily assessment and patient education.

Method: performance of a PDCA cycle entitled "Shoo Infection" with the aim of reducing the incidence of IPCS in hospitalized patients using intravascular devices and undergoing HSCT. Among the actions instituted are: daily audit of good practices in maintenance of vascular accesses and weekly audit of good practices in maintenance of vascular accesses in partnership with the Hospital Infection Control Service. Among the items audited are: types of catheters used, indication for use, condition of the dressing (wole dressing, clean and expired), conditions of insertion and devices. Bringing the patient to the care center, the "living screen of assistance" is delivered weekly: an instrument divided into 5 steps (hand hygiene, evaluation of the venous device dressing, catheter washing with the whirling technique, installation of the protective cap and carrying out the concurrent cleaning) that allows him to signal whether the care is being carried out according to good practices.

Results: The data is brought weekly in the Huddle of the unit in print, through graphs, visually, through photos and numerically, through the percentage of compliance with good practices. This meeting provides the team with a moment for discussion, possible interventions and suggestions for improvement. Comparing the semesters of 2022, in the weekly audits with the SCIH, there was an 11% increase in compliance with good practices in vascular device maintenance (from 64% to 75%). We evaluated 4108 items on 302 devices with a 30% reduction in the incidence density of IPCS.

Conclusion: After the beginning of the actions, the nursing team is more present in the evaluations, interventions and results presented during the audits. By bringing this data weekly to the entire nursing team, a state of responsibility and continuous education is promoted. These types of strategies promote a motivated and engaged workforce, reducing infection rates and consequently additional costs and improving patient clinical outcomes.

Keywords: nursing, hematopoietic stem cell transplantation, good practices, medication, nursing education.

CLINICAL PROFILE OF CHILDREN SUBMITTED TO HEMATOPOIETIC STEM CELL TRANSPLANTATION WHO USE TUNNELED CENTRAL VENOUS CATHETER

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Introduction: Hematopoietic stem cell transplantation (HSCT) requires a long-term central venous catheter (CVC) that allows the infusion of chemotherapy, medications, blood components, and nutritional support. Usually, in pediatric HSCT, the catheter used is the Hickman/Broviac and, while it is sufficient[1], complications may occur, such as occlusion, embolism, thrombosis, pneumothorax/hemothorax, among others[1,2]. Another rather incipient alternative – but one which has already been described in the literature as safe – is the use of the PowerPICC (peripherally inserted central catheter) device, which is centrally inserted and tunneled in the thoracic region[3,4].

Objective: To describe the clinical profile of pediatric patients undergoing HSCT who used centrally inserted central catheter (CICC).

Methods: Longitudinal study in pediatric patients aged 0-18 years, from February 2022 to March 2023, in the protected environment unit (PEU) of a public university hospital in the south of Brazil. The data used are part of the follow-up of the Vascular Access Program (PAV) and were extracted from the Research Electronic Data Capture-REDCap program. The study was approved by the Research Ethics Committee of the Institution, under CAAE No.: 9223119400005327.

Results: The sample consists of 15 patients, who had a 5 French dual lumen polyurethane catheter, with a predominance of insertion in the right internal jugular vein 53.3% (n=8) tunneled in the thoracic region. The median age was 11 years, and the median time of CICC use was 49 days. A total of 13 patients underwent allogeneic HSCT (86%) and 2 underwent autologous HSCT. Of the patients who underwent allogeneic, 47% (n=7) were unrelated and 40% were related (n=6). Regarding the source of cells, 67% (n=10) were from marrow and 33% (n=5) from peripheral blood. Regarding the intensity of conditioning, 80% (n=12) were myeloablative. During the use of the catheter, 53.3% (n=8) of the patients had no intercurrences, 20% (n=3) showed changes in flow and reflux, and 20% (n=3) had other complications. Complications such as infection (n=2), avulsion (n=2), and obstruction (n=1) were also observed. In total, six patients were discharged from the hospital with a catheter (40%), two were discharged without a catheter (13.3%), and two died (13.3%). Conclusion: The use of CICC in pediatric HSCT proved to be safe; however, the flow capacity is reduced, which may interfere with the moment of cell infusion. Stabilization remains a challenge with this catheter due to the age group. Nursing guidance continues to be essential for family members/caregivers in order to avoid accidental traction of the catheter in children with younger age or neurological deficit.

Keywords: Peripheral Catheterization. Transplantation. Pediatric Nurse Practitioners.

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COMPLEXITY OF SKIN CARE IN PATIENTS WITH CHRONIC GVHD AND TRAUMATIC INJURIES

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Introduction: Graft Versus Host Disease (GVHD) is one of the most frequent complications related to allogeneic HSCT (Hematopoietic Stem Cell Transplantation). The skin is usually affected, both in its acute and chronic form. The skin`s daily assessment, as well as the care of GVHD lesions, are part of the nursing routine in Hematology-Oncology (HemOnc).

Objective: describe the management carried out by specialists nurses of traumatic skin lesions in a patient with chronic GVHD.

Method: case report.

Results: male, 64 years old, 1 year and 8 months after unrelated HSCT due to Myelodysplastic Syndrome. Diagnosis of severe chronic GVHD of the skin, GI tract and central nervous system, chronic corticosteroid user. Skin GVHD with NIH score of 3, complete response to treatment, but still fragile skin, with disseminated ecchymosis. Seeks emergency room due to syncope and evolves with 3 subsequent cardiorespiratory arrests, etiology defined as drug toxicity (cardiac GVHD excluded by biopsy). Due to resuscitation maneuvers and skin fragility caused by GVHD and chronic steroid use, the patient developed several traumatic skin lesions on the trunk, back and upper limbs, in addition to ecchymosis in the temporal region, hands and lower limbs. Such lesions were treated and monitored by the HemOnc Nursing Team. A nursing care plan was designed to reduce pain and treat wounds. Avulsion injuries with viable tissue were treated with Mepitel and Dersani. Mepitel consists of a dressing with a silicone layer that gently molds to the skin, without adhering to the wet part of the wound, allowing the covering to be removed without damaging the epidermis. Dersani has healing and bactericidal action, helping in the healing process. In the lesions on the back and upper limbs with exudate, Biatain was used, intended for the treatment of exuding wounds with slow healing or those with high infection risk. Due to the fragility of the skin, all dressings were fixed with a bandage. After recovery, in friable skin regions, a multilayer foam dressing was used for protection. Management of conditions that contribute to healing (adequate nutrition, cytopenia/coagulation, stimulation of mobility) was also carried out by the multidisciplinary team. At the time of hospital discharge, the patient had no active lesions, being educated to maintain care at home.

Conclusion: skin recovery in patients with GVHD is a complex process that requires a multidisciplinary approach. Specialist skin care nurses play a critical role in the recovery of patients with GVHD. With their advanced knowledge and skills, these professionals provide personalized attention that helps to prevent complications, promote healing and improve quality of life.

DESIGN THINKING AS AN INNOCATIVE TEACHING AND LEARNING STRATEGY: A PROPOSAL FOR THE PROMOTION OF PATIENT SAFETY IN THE CONTEXT OF HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a highly complex procedure and is one of the main therapeutic modalities for patients diagnosed with oncological, hematological and congenital diseases. Empirically, possible human errors were observed, evidencing the need for notification of these events, and the creation of favorable conditions for the environment to be as safe as possible, thus, it is essential to address all causes of problems that impact on patient safety. In addition, educational measures are importance, for the promotion of safety and the Prevention of incidents.

General objective: Develop a pedagogical proposal, using the Design Thinking (DT) methodology, applicable to teaching patients safety undergoing hematopoietic stem cell transplantation.

Method: This is a research that considered the following methods, an integrative review of the literature, and the development of a product. For the literature review, the PICo strategy was used, thus, the following research question was formulated: What teaching and learning strategies have been used to promote patient safety in cancer treatment? The development of the product was based on an integrative literature review.

Results: The literature review showed the limited availability of scientific publications related to teaching and learning strategies, aimed at nursing professionals in the oncology area, reinforcing the need for scientific production on the subject, and also the development of new educational Technologies, in particular, the DT methodology, the central point of this study. The construction of the pedagogical proposal it was inspired by the DT method itself. The product contains four stages: the first to be applied to nursing preceptors, through the presentation of concepts about patient Safety, and the DT method; the second, whose target audience is nursing residents, who will develop the DT methodology to promote the safety of patients undergoing HSCT, facilitated by nursing preceptors. The third stage consists of showing the products developed by nursing residents for the health service, in the context of the safety of patients undergoing HSCT. The evaluation of the methodological proposal will take place in the fourth stage.

Final Remarks: The study showed that the Integrative literature review pointed to the scarcity of scientific publications on the subject, including that the DT methodology is not even mentioned as a teaching and learning method in the context of cancer patient safety. Thus, this research showed that contributing to the training of nursing residents, by addressing the theme through a proposal for pedagogical intervention through the DT method, enables the dissemination of knowledge, a factor that impacts patient health. Due to the importance of the theme, there is a need for further studies regarding to teaching safety of patients undergoing HSCT.

Descriptors: Hematopoietic stem cell transplantation , Nursing Education, Patient Safety.

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DEVELOPMENT OF A MULTIPROFESSIONAL PROTOCOL FOR CAR-T CELL THERAPY INFUSION

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Introduction: Chimeric Antigen Receptor T-Cell (CAR-T) therapy involves the genetic modification of autologous T cells to enhance their cellular response to malignant cells. This therapy was approved for application in Brazil by the National Health Surveillance Agency (ANVISA) in 2022 for institutions qualified for performing the procedure.

Objective: To report the protocol developed for CAR-T Cellular Therapy infusion in hematological patients at a philanthropic High Complexity Oncology Center (CACON) in southern Brazil.

Method: Experience report on the development of a multiprofessional protocol for CAR-T cell infusion, including pre-, intra-, and post-infusion care.

Results: The protocol was developed through multiprofessional meetings that identified the main care measures associated with the treatment and the responsibilities of each professional category. The defined actions were based on the institution's internal workflows, manufacturer's recommendations for infusion, and the main acute complications associated with the procedure, such as Cytokine Release Syndrome (CRS) and neurological toxicity. In the pre-infusion context, in addition to therapeutic indication evaluation, the procedures include cardiac evaluation, pulmonary function testing, neurological evaluation, dental evaluation, prophylactic COVID-19 testing, and epidemiological surveillance swab prior to hospitalization. During the cell infusion, professionals should consider advisements for cell manipulation, infusion time and main immediate infusion reactions. Following CAR-T administration, the multiprofessional team should be attentive to warning signs of complications, particularly those associated with CRS and neurological toxicity. In this perspective, the protocol established daily evaluation using ICANS (Immune Effector Cell-Associated Neurotoxicity Syndrome), which encompasses the ICE (Immune Effector Cell Encephalopathy) scale. Based on the ICANS results, Tocilizumab doses are initiated to manage CRS.

Conclusion: CAR-T cell therapy is an expanding treatment modality that will increasingly be present in the institution for heavily pretreated hematological patients. The definition of a care protocol for cell infusion is essential for the training of the multiprofessional team, guiding decision-making and reinforcing patient safety throughout the entire procedure.

Keywords: Chimeric Antigen Receptor Therapy. Clinical Protocols. Patient Care Team.

EARLY USE OF CHLORHEXIDINE-IMPREGNATED DRESSING IN CENTRAL VENOUS CATHETER OF PATIENTS SUBMITTED TO ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: The central venous catheter (CVC) is essential in all phases of the treatment of patients undergoing allogeneic hematopoietic stem cell transplantation (HSCT). Its use, along with excessive manipulations, is related to catheter-related bloodstream infections (CRBSI)[1]. Studies indicate that chlorhexidine gel dressing has benefits related to reducing microorganisms colonization, reducing the length of hospital stay, and to preserving the CVC[2,3]. Studies are not clear as to the early use of this dressing.

Objective: To evaluate the clinical outcomes of patients related to early use of chlorhexidine-impregnated dressing in CVC of patients undergoing allogeneic HSCT.

Methods: This is a longitudinal study, with retrospective data collection, conducted in 2022 in a protected environment unit of a public university hospital in southern Brazil. The sample was by convenience and includes all patients who made early use of chlorhexidine-impregnated dressing. Monitoring occurred weekly by the nurse of the Vascular Access Program (VAP) at the bedside. The recommendation for the use of the dressing, which was conducted by the clinical nurse, considered the following: presence of hyperemia with a >3mm halo and/or phlogistic signs during insertion or during the tunneled catheter. The study was approved by the Research Ethics Committee of the Institution, under CAAE No.: 9223119400005327.

Results: Eight patients used chlorhexidine-impregnated dressing. The median age was 37 years (24-59), 62.5% (n=5) were female. Regarding the type of allogeneic HSCT, 50% (n=4) were related. The reduced intensity conditioning regime represented 62.5% (n=5) of the sample. The Hickman® triple-lumen catheter was used in 100% of the cases, of which 62.5% (n=5) were uneventful. The right internal jugular vein represented 87.5% (n=7) of the insertions. Regarding the prescription of the dressing: 50% (n=4) occurred 15 days after catheter insertion; from 7 to 14 days 37.5% (n=3); and less than 24 hours 12.5% (n=1). The prescription for the dressing occurred during the first VAP monitoring visit in 25% (n=2); during the second in 50% (n=4); and 25% (n=2) during other monitoring. Regarding the number of days using the dressing, the mean was 53.4 days, following the criteria for good practices. The permanence of the catheter during the 60 days after the HSCT occurred in 87.5% of the patients. Only one patient was indicated for catheter removal before the 60 days after transplant due to developing CRBSI. Conclusions: Regarding the evaluation of the dressing, good tolerance to the coverage was observed in patients, allowing the permanence of the CVC until 60 days after the transplant. The earlier the monitoring visit, the more appropriate the indication of the dressing and consequently the better clinical results.

Keywords: Catheter-Related Infections. Transplantation. Infection Control Practitioners. Nursing Care.

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EPIDEMIOLOGICAL AND CLINICAL PROFILE OF PATIENTS ADMITTED TO A BONE MARROW TRANSPLANTATION INPATIENT UNIT

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a clinical treatment used for various hematological oncological and non-oncological diseases, as well as for certain solid tumors. It involves the infusion of bone marrow cells, which can be sourced from the patient themselves (autologous transplant) or from an external donor, related or unrelated, referred to as allogeneic transplantation.

Objective: What is the epidemiological and clinical profile of patients treated in the HSCT unit? Describe the clinical and epidemiological profile of patients admitted for HSCT. Method: Descriptive study based on the patient report data from the HSCT unit of a philanthropic hospital located in southern Brazil, covering the period of 2022. Data collection took place from April to May 2023, and the data were organized in an Excel spreadsheet. Data analysis was performed using simple statistics and presented as absolute numbers and percentages.

Results: In 2022, a total of 183 transplants were performed, with 64 females (35%) and 124 males (65%), ranging in age from 19 to 72 years, with an age average of 49.22 years. The majority of patients were over 50 years old (53%). Regarding the nature of the transplants, 106 were autologous (58%) and 77 were allogeneic (42%). Among the allogeneic transplants, 28 were from related donors (36%), 24 from unrelated donors (31%), and 25 were haploidentical transplants (33%). In terms of healthcare system, 69 transplants were performed through health insurance providers (38%), 5 were private (3%), and 109 were via the Brazilian Unified Health System (59.6%). The most common clinical diagnoses of patients admitted for HSCT were hematological oncological tumors, with multiple myeloma being the most frequent - 60 patients (33%), followed by lymphomas - 56 patients (31%), acute myeloid leukemia - 21 patients (11%), and other diagnoses of hematological tumors and solid tumors, such as acute lymphoblastic leukemia, myelodysplastic syndrome, myelofibrosis, testicular tumor, aplastic anemia, and medullary aplasia, were found in smaller proportions. Analyzing the most common tumors by sex, multiple myeloma was more prevalent in males (33%), while lymphomas were more prevalent in females (36%).

Conclusion: HSCT is mainly used for patients with hematological tumors and blood disorders, with multiple myeloma and lymphomas being the most frequent conditions. The population undergoing HSCT is typically older and predominantly receives autologous transplants. Mapping the clinical and epidemiological profile of these patients is crucial for better planning and organization of healthcare measures within the hospital institution, leading to improved care and interventions.

Keywords: Hematopoietic. Hematopoietic stem cell transplantation. Oncology nursing

EVALUATION OF THE EFFECTIVENESS OF A SPECIFIC SKILLS PROGRAM FOR HEMATOPOIETIC CELL TRANSPLANTATION (HCT) AIMED AT NEW EMPLOYEES

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Background: HCT is an alternative treatment for both malignant and non-malignant diseases that affect the functioning of the bone marrow. It is a complex procedure, with a high risk of morbidity and mortality, which requires a specialized and integrated assistance process between areas, with duly trained professionals.

Objective: to guarantee the alignment of care processes for patients undergoing HCT, through educational actions aimed at integrated patient care.

Methods: the present study was carried out from January to October 2022. As an educational strategy, the Specific Skills Program - PCE was developed along with the integration process for new employees. The PCE includes topics related to the phases of HCT such as: conditioning, bone marrow infusion, post-transplantation, medullary attachment, and care after discharge. These themes were addressed through dialogued lectures. Employees were submitted to two evaluations, one before the training and one after. This process consisted of a test with 11 multiple-choice questions, aimed at assistance during the HCT.

Results: over the proposed period, 49 professionals were trained. Of these, 33 (67%) were female, 16 (33%) males. In terms of professional categories, 20 (41%) were clinical nurses, 28 (57%) nursing technicians and 1 (2%) Educational Nurse. Regarding origin, 30 (61%) of the collaborators were from the Intensive Care Unit, 17(35%) from the Infusion Center, 1(2%) Oncology Inpatient Unit and 1(2%) from the Education Team. For the training of professionals, 6 groups were held, with a workload of 6 hours. Regarding the evaluation of the effectiveness of the PCE, an average of 60% correct answers was observed in the pre-test. In the post-test, the average of correct answers was 89%, which reflects an increase of 29%.

Discussion and Conclusion: despite the structure and topics addressed in the PCE, there are opportunities for improvement in relation to the increase in employee knowledge after training. Therefore, it is intended, after this study, to carry out an update in the PCE structure, with the fragmentation of the course contents, increase in the workload and use of the active methodology for better retention of knowledge of the collaborator and consequently the improvement of the quality of the assistance provided, directed to an integrated care of the patient in HCT.

EVALUATION OF THE MULTIDISCIPLINARY TEAM SATISFACTION AFTER THE IMPLEMENTATION OF THE SAFETY HUDDLE IN AN ADULT HEMATOPOIETIC STEM CELL TRANSPLANTATION INPATIENT UNIT

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Introduction: In 2017, the Institute for Healthcare Improvement proposed 9 tools to increase patient's safety, one of them is the huddle, daily quick meeting aiming to recognize situations that may interfere with the quality of the healthcare and to prevent adverse events. The hematopoietic stem cell transplant (HSCT) inpatient unit is a complex environment of specialized assistance. The use of the huddle can be an effective strategy to improve the quality of the assistance, stimulating multidisciplinary team interactions. In this study, the huddle was defined as "safety huddle" (SH), a term also used in other institutions. The SH can be a great ally in complex units, contributing to improve the communication between the multidisciplinary team, reducing adverse events and ensuring greater safety in patient care.

Objective: Evaluate and describe the satisfaction and engagement of the multidisciplinary team with the SH implementation.

Methods: Cross-sectional and descriptive study, in an adult HSCT inpatient unit, in April 2022. After the consent process, a satisfaction and engagement questionnaire was applied to the professionals who attended the SH meetings, to assess the tool applicability. The questionnaire was composed of questions about the professional category, age, gender, level of education, HSCT unit working time, and five multiple-choice questions using the Likert scale regarding the tool implementation in the unit and healthcare improvement.

Results: Ten months after the SH tool implementation, 16 professionals from the HSCT multidisciplinary team answered the questionnaire (Table 1). The participants mean age was 32 years old (ranging from 24 – 46 years old). From the questionnaire, it was possible to observe a high level of satisfaction with the instrument implementation in the department routine (Table 2) and reinforced that the tool can be an ally of the multidisciplinary team to guarantee the continuity of the patient care, besides to result in greater interaction and communication among professionals. The SH meetings help identify and prevent adverse events, minimize incidents, and awareness of the staff responsibilities and role in the transplantation process.

Conclusion: The SH tool proved to be a favorable resource for improving satisfaction and interaction between the multidisciplinary team.

Keywords: hematopoietic stem cell transplant; hospitalization, nursing care; prevention; safety; huddle; multidisciplinary team.

TABLE 1 - Characteristics of the multidisciplinary team who answered the questionnaire

		N	%
Sex	Female	13	81.3
	Male	3	18.8
Professional category	Nurse	5	31.3
	Physician	2	12.5
	Dentist	2	12.5
	Psychologist	1	6.3
	Nutricionist	1	6.3
	Physiotherapist	1	6.3
	Nurse technician	2	12.5
	Pharmacist	1	6.3
	Occupational Therapist	1	6.3
Education level	Technical education	2	12.5
	College education	7	43.8
	Post-graduation/Residency	4	25.0
	Master's degree	3	18.8
	PhD	0	0.0
HSCT unit working time (months)	0 - 6 months	2	12.5
	7 - 12 months	3	18.8
	13 - 24 months	2	12.5
	Greater than 24 months	9	56.3

TABLE 2 - Satisfaction and engagement questionnaire - questions related to the SH tool implementation

Question	Answer	N	%
After the SH tool implementation in the adult HSCT unit, were there improvements in relation to communication between the multidisciplinary team?	Strongly agree	7	43.8
	Agree	9	56.3
	Neither agree nor disagree	0	0.0
	Disagree	0	0.0
	Strongly disagree	0	0.0
After tool implementation, were improvements observed about the recognition of possible adverse events that could affect the patient?	Strongly agree	9	56.3
	Agree	7	43.8
	Neither agree nor disagree	0	0.0
	Disagree	0	0.0
	Strongly disagree	0	0.0
After tool implementation, were improvements observed in relation to the interpersonal relationship between the work team?	Strongly agree	5	33.3
	Agree	8	53.3
	Neither agree nor disagree	1	6.7
	Disagree	0	0.0
	Strongly disagree	1	6.7
After tool implementation, was there greater satisfaction and engagement of the team?	Strongly agree	4	25.0
	Agree	6	37.5
	Neither agree nor disagree	5	31.3
	Disagree	0	0.0
	Strongly disagree	1	6.3
Is the SH tool an important instrument to assist patient safety?	Strongly agree	7	43.8
	Agree	7	43.8
	Neither agree nor disagree	1	6.3
	Disagree	1	6.3
	Strongly disagree	0	0.0

EXPERIENCE REPORT AT A PRIVATE HOSPITAL IN THE IMPLEMENTATION OF A THERAPY PROGRAM WITH CHIMERIC ANTIGEN RECEPTOR (CAR-T CELLS): TRAINING AND QUALIFICATION OF THE PATIENT CARE TEAM

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Introduction: therapy with CAR-T cells has gained increasing clinical relevance, being one of the most promising therapies in recent times. It is a still complex treatment, which consists of a single infusion of genetically modified cells, with short recovery times and lasting benefits. In Brazil, there is still no specific regulation for the centers that will use this therapy, which is why it is necessary to train the care teams.

Methods: This is an experience report-type study, carried out in a private general hospital in the city of São Paulo, in which a therapy program with immunoeffector cells (CAR-T) was implemented, which included a specific process training of the care team for patient management and main clinical complications.

Results: Initially, theoretical classes were held to familiarize professionals with the new therapy. Afterwards, an institutional training and education program divided into two parts was created: theoretical and practical for medical professionals, nursing (nurses and nursing technicians) and physiotherapists working in the Bone Marrow Transplant Unit, Intensive Care Unit, Emergency Room and Infusion Center. In the theoretical part, the following contents were addressed: definition of how therapy with CAR-T cells works, the patient's journey from selection to survival, care during cell infusion, specific care and main toxicities: cytokine release syndrome and neurotoxicity (signs and symptoms, grading scales and clinical management). The practical part had a realistic simulation encompassing all professionals and the scenario that this patient could encounter, focusing on symptom management and application of toxicity scales and their graduation. Specifically for medical content, online training was provided. In addition, a physical folder was made available with support content in all areas involved in the training process.

Conclusion: Patients receiving immunoeffector cell therapy (CAR-T) require 24/7 monitoring whether in an inpatient or outpatient setting. The training of professionals who work directly in the care of this patient is essential to guarantee the quality, safety and continuity of the care provided. Good practices include toxicity rating scales easily accessible to all involved allowing for more ongoing patient management.

Keywords: Training, Chimeric Antigen Receptor Therapy, Patient Care Team, Health education.

EXPERIENCE REPORT OF A HEMATOPOIETIC STEM CELL TRANSPLANTATION CENTER WITH THE 1ST IMPROVEMENT CLASS IN THE FELLOW MODE IN NURSING CARE IN HEMATOPOIETIC STEM CELL TRANSPLANTATION

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The hematopoietic stem cell transplantation (HSCT) is a high complexity procedure. The nursing assistance in the HSCT services requires specialized care considering the specificities of each treatment step. Currently Brazil has no post-graduation improvement program and/or nurse specialization in this field of knowledge. Is observed a significant increase of transplant units in the country, this growth reflects the need of training new nursing professionals based on developing competence, skills and attitudes that stimulate the critical thinking to assist patients.

Objective: Describe the experience of implementing the 1st Hematopoietic Stem Cell Transplantation Improvement program in the fellow mode in nursing care.

Methodology: Regards to a descriptive study reporting the experience about the construction and implementation of the 1st Fellow Improvement Program in Nursing Care in HSCT.

Results: In January 2022, after the previous experience (2016-2022) with the creation of three other Fellow programs in the Institution, our Center which is a reference in the Oncology field through the Health Ministry, has elaborated a Fellow program in HSCT. In this search for qualification and specialization in nursing, a group of nurses (masters and doctors) specialized in oncology and with vast experience in HSCT, got together for the elaboration of the 1st Fellow Improvement Program in HSCT Nursing Care. Following the current steps: 1st step - Submission of the proposal to the Coordination of Nursing Education (COENS-Enf); 2nd step - Assessment and approval of the proposal by the Integrated Committee for Political and Educational Evaluation (CIAPE); 3rd step - Preparation of the Course Plan in partnership with COENSEnf and CIAPE; 4th step - Preparation of the announcement of the selection process. The course started in 2023, being of a theoretical-practical and practical nature, developed over a period of 12 months, in person modality. The total workload of the course is 2080 hours with 40 hours a week, with one scholarship offered by the institution. It is organized in three modules: Module I, theoretical-practical activities with the objective of deepening the students' knowledge in HSCT nursing care. Module II, theoretical activities organized throughout the course to guide and accompany the construction of the Course Conclusion Work. Module III, which is practical, presents four fields of action that allows the practical development of specific activities in the HSCT area. In the selection process, two vacancies were offered, both of which were filled.

Final considerations: The Fellow program will contribute to the understanding of the care process, fostering professional qualification and, consequently, the qualification of nursing care in this specialty, as well as promoting the safety of the patient undergoing HSCT.

Descriptors: Education; Nursing; Hematopoietic Stem Cell Transplantation.

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EXPERIENCE REPORT ON CARRYING OUT A VALIDATION PROCESS FOR NURSING PROFESSIONALS IN A DRUG CHAIN (PREPARATION AND ADMINISTRATION OF INTRAVENOUS MEDICATION) IN A HEMATOPOETIC STEM CELL TRANSPLANTATION UNIT

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Introduction: The process of providing medication in a hospital environment is multidisciplinary and consists of several such as prescription, dispensing, preparation and administration of medications. The misuse and omission of safety standards related to the drug chain can cause several problems for both the patient and the Health Institution. Medication error is defined as any phase of drug therapy that may cause harm to the patient. Medication preparation must be carried out using aseptic technique, avoiding contamination of fluids and exposure of the patient to primary bloodstream infection, a condition that can be aggravated by immunosuppression, treatments and illness of the patient undergoing HSCT.

Objectives: carrying out a cycle with the PDCA tool in order to standardize the medication preparation and administration processes.

Methods: The first step consisted of building a medication preparation and administration instrument with contributions from the technical group formed by the leadership of the HSCT inpatient unit, infusion therapy nurse, SCIH nurse and training nurse from the Institute of Teaching Knowledge and Search. Next, the professionals who would apply the instrument were validated by the technical group. After validation and training of audits, the action was divided into 2 scenarios: real-time assistance and realistic simulation. Technical and nursing professionals at the unit for patients undergoing HSCT were evaluated in preparing and administering medication at the bedside. A team meeting was held to present the team's results, discuss the most common opportunities for improvement, and reinforce the theoretical content of medication preparation and administration. In a second moment, 30 days after the first evaluation, all professionals were validated in a realistic simulation. In both scenarios, a continuous dialogue was obtained with the employee, with suggestions and the removal of doubts in real time.

Results: When compiling the data from the first and second stages, an improvement was noted in the items that were deficient, including: disinfection of the tray or auxiliary table (55% compliance to 91% compliance), disinfection of the ampoules (67 % to 94%), breaking the ampoule correctly (55% to 94%) and hand hygiene at moment 2 – before the clean/aseptic procedure during medication preparation (from 85% to 97%). Hand hygiene at time 1 (before touching the patient) and at time 2 (bedside) also improved between steps (95% to 99% compliance).

Conclusion: Although the practice of preparing and administering medication is present in the training and day-to-day of nursing, revalidation is necessary for a standardized, strengthened, organized and integrated service. The preparation and administration of medications is an interdisciplinary process that requires scientific, technical and practical knowledge.

Keywords: nursing, hematopoietic stem cell transplantation , bloodstream infection, nursing education

IMPLEMENTATION OF A QUALITY MANAGEMENT PROGRAM IN HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT)

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Introduction: establishing a HSCT program is a major challenge for health services, as it involves unique systematic clinical care in all phases of the treatment.

Objectives: to develop and implement a specific Quality Management Program in HSCT, with a focus in improving quality and patient safety.

Methods: this quality management program was implemented in a private general hospital in the city of São Paulo between January 2020 and January 2023. The process started mapping all administrative and clinical processes, formalizing protocols, and operating procedures, creating a database with clinical data of the patients, constructing, and implementing indicators of clinical outcomes and processes. The 10 indicators were: overall survival for all patients and according to the type of HSCT, event-free survival, acute and chronic graft-versus-host disease, health care-associated infections, compliance with conditioning therapy protocols, compliance filling in the medical records, accuracy of clinical data reported to the center for international blood and marrow transplant research (CIBMTR). Additionally, there was a reformulation of the training program for the team involved in HSCT care, implementation of meetings for discussion and critical analyses of indicators, implementation of tracer audits of the patient's line of care, audits of the medical records and of data reported to the CIBMTR.

Results: this study, made it possible to measure and evaluate the clinical outcomes and processes related to the HSCT patients. A better interface between the areas and training of the multidisciplinary team was built. A total of 286 nurses were trained, and 133 professionals from the multidisciplinary team. Thirteen documents focused on HSCT were created and 12 audits of patients' administrative and clinical processes were carried out. In addition, there was a 6% increase in the survival rate of this population, for both autologous and allogeneic HSCT, compared with the period prior to the program.

Conclusions: the implementation of the program brought improvements to the line of care, impacting positively in the quality and patient safety. Timely detection of weaknesses was also observed, allowing the development of action plans for continuous improvement of processes and clinical outcome of the patients.

IMPLEMENTATION OF AN EARLY ASSESSMENT SCALE IN PEDIATRICS IN THE HEMATOPOIETIC STEM CELL TRANSPLANTATION UNIT IN A CHILDREN'S AND JUVENILE CANCER HOSPITAL

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Introduction: It´s essential that the multiprofissional health team knows how to evaluate the main signs of clinical deterioration during patient care, especially when it comes to patients undergoing Hematopoietic Stem Cell Transplantation (HSCT). Faced with this need, through a partnership with an American hospital, a children's and adolescent hospital in the countryside of Sao Paulo, it began the implementation of a scale system in a HSCT ward. The scale used was the EVAT (Escala de Valoración de Alerta Temprana), which arose from a modification of the PEWS (Pediatric Early Warning Scores) scale. The EVAT aims to identify early clinical worsening of hospitalized pediatric cancer patients. The EVAT works in two moments: in the first, the scoring system contemplates physical evaluation and vital signs, with the exception of blood pressure, since it is considered a late sign of clinical worsening in the patient and the EVAT works with early data. In the second moment, the nurse classifies the patient, based on the data collected, generating a score in colors. The colors are divided into green, yellow, and red.

Objective: To describe the experience of using the EVAT scale in a pediatric HSCT ward.

Method: Descriptive study with a quantitative approach, conducted in a pediatric HSCT ward from August 2022 to April 2023.

Results: EVAT was performed in 100% of hospitalized patients between August 2022 and April 2023. Regarding the evaluations of this period: 97% were green, 2% yellow and 1% red. Regarding the type of HSCT that scored red VAS, they were: 15% autologous, 61% haploidentical, 15% unrelated and 8% related HLA identical. Regarding the causes of red EVAT, 100% were related to heart rate and altered respiratory rate, 34% nursing concern, 25% family concern and 6% physical examination. Still in relation to red EVAT, 8% occurred at D0 and 92% were in the first 20 days after infusion. Of these patients, 23% were referred to the ICU, and 33% of them were signaling signs of clinical deterioration in the last 24 hours, demonstrated in yellow EVAT.

Conclusion: The scale actively collaborated in the work of the nurse, also improving the communication between the medical and nursing team, assisting in early interventions. Another benefit was the decrease in transfers to the ICU and shorter stay in this unit. However, it is worth mentioning that during the period analyzed, in a few situations in the HSCT ward, the EVAT scale did not score and yet there was a need to refer the patient to the ICU. Thus, it is important that the team is always very attentive and aware that patients hospitalized in pediatric HSCT may abruptly present a clinical deterioration.

Keywords: pediatric nursing; hematopoietic stem cell transplantation; clinical deterioration.

IMPLEMENTATION OF THE NURSE NAVIGATOR IN HEMATOLOGY AND ADHERENCE TO CHEMOTHERAPY TREATMENT IN A BONE MARROW TRANSPLANT CENTER IN THE STATE OF PARANÁ - EXPERIENCE REPORT

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Introduction: Navigation Programs emerged with the aim of helping patients overcome existing barriers in the treatment process, whether it is within the hospital or even at home, providing better quality of life and disease management. In cancer treatment, chemotherapy is one of the elements that compose the therapeutic plan, however the toxicity of its components cause clinical signs and symptoms that discourage the patient from continuing the treatment, weakening the therapeutic process which consequently affects the patient's prognosis. After the implementation of the hematology and bone marrow transplant center, the need for a nurse navigator was identified to guide the hematological patient from their first contact until the bone marrow transplant, aiming to prioritize essential care points, such as providing guidance on the proposed treatment, including chemotherapy, in addition to facilitating access to information and assisting patients and family members individually.

Objective: To report the therapeutic process from admission to bone marrow transplantation, accompanied by navigation nurses.

Method: Experience report experienced by the nurse navigator in the hematological hospitalization unit of a Bone Marrow Transplant center of a philanthropic hospital, located in Curitiba, Paraná.

Results: The therapeutic process of oncology patients is highly complex, mainly at admission, considering the biopsychosocial factors, where there is the impact of the diagnosis and also of the treatment that commonly begins with chemotherapy. In face of this, the patient's fragility can be noted, where adverse signs and symptoms to the treatment arise, as well as doubts, which result in the discontinuity of the proposed therapeutic. In this scenario, the nurse navigator was extremely important, offering knowledge about the clinical condition and information on pre and post-infusion care of antineoplastics, taking into account the individual's reality. 115 hospitalized patients were followed between the years of 2021 to 2022, where 46 underwent chemotherapy cycles and were discharged for outpatient follow-up, while 41 of them needed rehospitalizations for follow-up, 4 proved resistant or non-adherent to the guidelines and another 24 were eligible for bone marrow transplant and successfully completed the treatment.

Conclusion: The implementation of navigation in hematology brought an improvement in patient follow-up and in the perception of the importance of continuity of chemotherapy treatment, in addition to acting in the improvement of ties between the multiprofessional team and the patient, favoring the transmission of information, facilitating their experience, ensuring better adherence and conclusion of the proposed treatment, conditioning it to initiate the procedures of the bone marrow transplant.

Keywords: Navigation, Nursing navigation, Chemotherapy, Treatment adherence, Hematology.

METHOD FOR NAVIGATION IN PATIENTS SUBMITTED TO HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Hematological diseases affect the bone marrow, modifying its composition and can be fatal, often being an emergency the beginning of treatment. Conventional treatment for oncohematological diseases is usually performed with antineoplastic agents, but not all diseases respond adequately and the patient is referred for Hematopoietic Stem Cell Transplantation (HSCT), a more aggressive treatment, but with chances of cure. HSCT is highly complex and requires dedication and control, both on the part of the health professionals involved and on the part of the patients and their families, as it is a new sector, a new hospital environment, a new follow-up routine to deal with the new reality. of the disease, everything is quite different from what has already been submitted. Objective: to develop a navigation flowchart to monitor and guarantee the adaptation of the patient and family to the sector and such a peculiar routine, and to optimize adherence and therapeutic success of the patient who will undergo HSCT.

Methodology: review of evidence studies and publications in the LILAC database with the descriptors, HSCT Navigation, HSCT Symptom Controls, HSCT Complication Prevention.

Result: After reviewing the articles and clinical discussion, the flowchart for optimizing the patient's trajectory was elaborated, following the following steps: In view of the complexity of HSCT, the implementation of the flowchart emerges as a beneficial strategy for patients and their families, who will be guided throughout the pre-transplant process: The patient must be guided about all phases of the treatment and he and his companion - caregiver will be part of the construction of this line of care, participation in decision-making, perceptions of early warning signs, care that should have home continuity and responsibility for treatment. Hospitalization, conditioning, post-transplantation and outpatient follow-up. The main decision points in the flowchart were: Nursing Consultation – Checking Exams – Opinion of the Multiprofessional Team – Care Plan for Each Phase – Symptom Control for Each Phase – Prevention of Injuries in each phase – Preparation for Discharge – Follow up.

Conclusion: This study emphasizes the need for a multidisciplinary work set as a differential, as the involvement with these patients and their families goes beyond daily activities, realizing a unique and individualized model that goes beyond interpersonal relationships.

Keywords: Navigation . Folow – up . Oncology.

MULTIDISCIPLINARY THERAPEUTIC PLAN IN A HEMATOPOIETIC STEM CELL TRANSPLANT UNIT

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Introduction: Bone marrow transplantation (BMT) is a type of treatment proposed for some diseases that affect blood cells, such as leukemias and lymphomas, and consists of the replacement of diseased or deficient bone marrow with normal bone marrow cells, with the goal of reconstituting healthy marrow.(INCA,2023).

Objective: To prepare a therapeutic plan for the multiprofessional care of a hematopoietic stem cell transplantation (HSCT) unit.

Methods: The document was prepared by oncology specialist nurses working in the HSCT sector of a private hospital in Rio de Janeiro from 03/2022 to 06/2022.

Results: The prepared instrument took into account the needs of hospitalized patients and ensuring the quality of multiprofessional care.

Conclusion: The preparation of this instrument demanded integrated management action to ensure individualized, humanized and ethical care to the patient, thus promoting improvement in the quality of care provided.

Keywords: Hematopoietic Stem Cell Transplantation, Multi Professional Team, Patient Care Planning.

FIGURE - 1 - Multi Professional therapeutic plan instrument

HOSPITAL CASA | HOSPITAL DE CÂNCER

THERAPEUTIC PLAN TRANSPLANT UNIT

Patient Name:		Bed:		HSCT DAYS	-1
Date of birth:		Age:	Health insurance:		
Admission Date		Service Number:			
Diagnosis:					
Allergies					

Discharge Forecast	( ) YES ( ) NO
	Data: ____/____/_____

RISK MANAGEMENT	
( )	Allergy Risk
( )	Fall Risk
( )	Risk of Infection
( )	Risk of self-extubation/accidental extubation
( )	Aspiration Risk
( )	Risk of Skin Injury
( )	Device Loss Risk

DEVICES:

TYPES	Place of Insertion	Insertion Date	Is there a need to Maintain the device?	
AVP				
Permcath			( ) YES	( ) NO
PICC			( ) YES	( ) NO
deep			( ) YES	( ) NO
			( ) YES	( ) NO
			( ) YES	( ) NO
			( ) YES	( ) NO
			( ) YES	( ) NO

Local	Cutaneous Lesion Classification	Roof	Dressing Date	Exchange Date	Preventive measures
					( )Adequate ( )Inappropriate
					( )Adequate ( )Inappropriate
					( ) Adequate ( )Inappropriate

MUCOSITIS

( ) NO ( ) YES **Classification:** ( ) DEGREE 1 ( ) DEGREE 2 ( ) DEGREE 3 ( ) DEGREE 4 ( ) DEGREE 5

Morse scale

Item	score		Punctuation
1. History of falls in this hospitalization/urgency or in the last 03 months	NO	0	
	YES	25	Punctuation
2. Secondary Diagnosis(ies)	NO	0	
	YES	15	
3. Walking aid			
None / Nurse help / Bedridden / Wheelchair	0		
Crutches /Canadian/ Cane/Waller	15		
Lean on furniture to walk	30		
4. Intravenous therapy/salinized or heparinized venous catheter.	YES	0	
	YES	20	
5. Walking Posture and Transfer			
Normal/Bedded/Immovable		0	
debilitated		10	
help dependent		20	
6.Mental State			
Aware of Your Capabilities		0	
Forget Your Limitations		15	

Total :_____

Classification:	Good Nursing Care	Identify with Bracelet	Identify with Bracelet
	ESCORE: 0 - 24	ESCORE: 25 - 50	ESCORE: ≥51
	without risk	low risk	high risk

FIGURE - 2 - Multi Professional therapeutic plan instrument

MULTISCIPLINARY DAILY GOALS		Reached by late afternoon?	Pós-Round
Monday		( ) Yes ( ) No	
		Just.:	
Date			Round participants names
Tuesday		( ) Yes ( ) No	
		Just.:	
Date:			Round participants names
Wednesday		( ) Yes ( ) No	
		Just.:	
Date:			Round participants names
Thursday		( ) Yes ( ) No	
		Just.:	
Date:			Round participants names
Friday		( ) Yes ( ) No	
		Just.:	
Date:			Round participants names
Saturday		( ) Yes ( ) No	
		Just.:	
Date:			Round participants names
Sunday		( ) Yes ( ) No	
		Just.:	
Date:			Round participants names
Comments			

NURSING CARE FOR CHILDREN IN HEMATOPOIETIC STEM CELL POST-TRANSPLANT

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Introduction: Hematopoietic stem cell transplant consists in the replacement of the damaged bone marrow by a healthy one, which may be autologous or allogeneic, through immunosuppression mediated by high doses of chemotherapy and/or radiotherapy. In the pediatric audience the most transplanted organ is the bone marrow, it is also the most successful in comparison to adults, indicating the need for constant research and monitoring in the family and child's adaptation to care during and after hospital discharge. It is believed that understanding the main post-transplant care of children allows Nursing to plan and implement holistic and multidimensional care, focused on prevention and health promotion for this audience.

Objective: To understand the main nursing care performed with pediatric patients of hematopoietic stem cell post-transplant.

Method: Study review of Narrative literature.

Results: Nursing problems that affects post-transplant recovery are listed from the dimensions of basic human needs, which are: psychobiological, psychosocial and psychospiritual. Psychobiological needs include conditioning toxicity, neutropenia, graft-versus-host disease, fever, transfusion reactions, mucositis, nasoenteral probe use, pancytopenia and bleeding. The main care regarding it covers health history investigation, clinical evolution monitoring, physical examination, water balance, frequent temperature control, central venous catheter care, up to guidance and home care supervision. Laser therapy stands out with positive effects controlling oral pain as a less invasive therapy with local anti-inflammatory action. In what concerns psychosocial needs, they turn to temporary change of residence, school outage, alteration in growth and development as well as hospital readmissions. It is vital that Nursing understands the dimension of this role in care, maintaining easy-to-understand communication, welcoming and including the family in decisions about treatment. The care in this dimension also requires multiprofessional support in monitoring child development and encouraging the resumption of schooling when possible. The psycho-spiritual needs are focused on spirituality, hope and care held by a caregiver. Faith is highlighted as a source of support and protection in crucial moments of treatment.

Conclusion: Child care in post-transplant must include the hospital, the family and the home that must be readapted to the new reality. It also requires periodic evaluation with special attention to neutropenia, fever, infections prevention, central catheter care and nutritional losses. The guidance for care should occur in a holistic way requiring multiprofessional action, seeking to cover the dimensions of life affected by transplantation.

NURSING CARE FOR PATIENTS UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION WITH HEMORRHAGIC CYSTITIS

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a procedure aimed at restoring patients with hematological diseases. Hemorrhagic cystitis (HC) is a complication of HSCT and, characterized as an inflammatory process associated with hemorrhage of the bladder mucosa, ranging from microscopic hematuria to intense pain and macroscopic hematuria with clots, of early or late origin. Studies show that there is a relationship between the use of chemotherapy drugs, especially cyclophosphamide, with urotropic viruses such as adenovirus, cytomegalovirus and polyomavirus.

Objective: To map the literature on hemorrhagic cystitis and nursing care.

Method: scope review, with search performed in PUBMED, LILACS, SCIELO, Google Scholar® for gray literature. The bibliographical references of the selected studies were also checked, in order to locate the largest possible number of publications. The PCC strategy (acronym for Patient, Concept, Context) was used in this review, studies of patients with hemorrhagic cystitis, addressing the concept of nursing care and the context of complications in HSCT, published in the last 10 years, in Portuguese, English and Spanish, available in full. Experience report studies were excluded. The search was carried out from January to March 2023. The six methodological steps for the scope review were followed: identification of the research question; identification of relevant studies; selection of studies; data extraction; separation, summarization and reporting and dissemination of search results. The search strategy was developed by an experienced librarian and exported to an online bibliographic management tool. Then, separately, two reviewers redid the search and read the selected articles, extracting the data and using the synthesis matrix.

Results: The analysis of the publications was based on a critical and detailed reading, removing the relevant factors for nursing care in transplanted patients with HC, totaling 120 studies that met the criteria stipulated for this review. Among the precautions that emerged from the review: Hyper hydration; administration of diuretics; monitor the appearance and volume of diuresis; rigorous administration of uroprotectant; perform rigorous water balance; three-way foley bladder catheterization; continuous bladder irrigation.

Conclusion: It is essential the performance of the nursing team in the prevention of hemorrhagic cystitis, as well as the early recognition of signs and symptoms to minimize the situation, acting in a systematic and effective way, contributing to the quality of nursing care based on evidence.

Descriptors: hematopoietic stem cell transplantation, nursing care, adverse events.

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NURSING CARE IN HEMATOPOETIC STEM CELL TRANSPLANTATION: AN INTEGRATIVE LITERATURE REVIEW

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a procedure used to treat immuno-onco-hematological diseases, with the aim of recovering normal bone marrow function[1]. Nursing care must be specialized, and it is up to the nurse to plan and implement it, aiming at the success of the transplant.

Objective: To identify the main attributions of the clinical nurse in HSCT units.

Methodology: This is a bibliographical review carried out in the Medical Literature Analysis and Retrieval System Online databases and in the Nursing Journals Portal of articles published between 2006 and 2020. Data collection took place in the year 2020 and the sample consisted of 22 articles. The descriptors used were: "Oncology Nursing", "Nursing Care", "Cell Transplantation", "Health Education", "Hematopoietic Stem Cells", "Bone Marrow", "Role of the Nursing Professional", "Process of Nursing". Inclusion criteria were: electronic publications, indexed, complete and free, developed by the health area and published in Portuguese. Exclusion criteria were: studies published in duplicate, in a foreign language, abstracts, brief reports, letters to the editor, conference proceedings, government documents, secondary sources, books, dissertations, monographs and theses.

Results: The search resulted in the identification of 134 articles, of which 22 met the inclusion criteria and were divided into 3 categories: performance and activities of nurses in the HSCT unit (n=13), methods used by nurses for continuing education for the team (n=2) and general guidelines given by the nurse to the patient, family and caregivers (n=7). The main competences assigned to the HSCT care nurse were: knowing the demand of each phase of the transplant; identify the complications as well as the appropriate intervention; have technical competence in complex procedures; provide high-level assistance; plan humane and individualized care; carry out permanent training with the nursing team; carry out continuing education with patients and their caregivers; qualify for multi and interdisciplinary teamwork, among others.

Conclusion: The study reaffirms that nurses play a fundamental role in the success and improvement of the transplanted patient's quality of life, considering that HSCT is a complex procedure. In short, a qualified nursing team is essential to act in any and all clinical manifestations during the transplant, as well as in the health education of the patient and his family.

Keywords: Oncology Nursing. Nursing Assistance. Hematopoietic Stem Cells.

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NURSING CARE IN THE PRE-TRANSPLANTATION OF HEMATOPOIETIC STEM CELLS: SERVICE PROFILE FOR THE YEAR 2022 IN A REFERENCE HOSPITAL

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a complex procedure, in which the patient is submitted to chemotherapy and immunosuppressants that compromise the immune response[1]. The nurse plays a crucial role in the stages of this process. Nursing care before HSCT aims to guide patients and caregivers about the stages of transplantation, procedures, care and necessary routines at the inpatient unit. The educational actions are complex and the difficulty of understanding by patients and caregivers can interfere with the outcome of the treatment[2].

Objectives: To describe the profile of care provided by nurses in the pre-HSCT period in a reference hospital for HSCT in the south of the country.

Method: Experience report carried out by onco-hematology nurses who provide patient care in a protected environment unit (PEU). Data collection took place between January and December 2022. Data were categorized into: date of consultation, type of HSCT (autologous, related allogeneic and unrelated allogeneic) and type of consultation (face-to-face at the outpatient clinic, call center or inpatient).

Results: The pre-HSCT nursing consultation was divided into a complete anamnesis and physical examination, and later, a presentation on PEU routines and the transplant process. In 2022, 69 pre-HSCT nursing consultations were carried out, 34 of which were autologous and 35 allogeneic (17 related and 18 unrelated). performing the transplant. Of the total number of teleconsultations, 32 correspond to autologous HSCT, while face-to-face consultation was chosen for allogeneic consultations, given the greater complexity of the procedure and the information to be shared.

Conclusions: This approach was fundamental, as it allowed nurses to carry out an initial assessment, identifying possible vulnerabilities and/or weaknesses that could interfere with the transplant process, both during hospitalization and in the post-transplant period. In addition, the patient received guidance related to the unit's routines and the procedure prior to his hospitalization, clarifying his doubts. It was observed that the teleconsultations proved to be effective for autologous HSCT and that, despite some limitations imposed by this method reflected in the patient's hospitalization, its realization is justified, since it reduces the patient's hospital exposure time in the period of pandemic. However, due to the complexity of allogeneic transplants, there was a need to maintain face-to-face consultations.

Keywords: Health education. Hematopoietic stem cell transplantation. Nursing care.

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QUALITY OF LIFE OF PATIENTS SUBMITTED TO STEM CELL TRANSPLANTATION – HEMATOPOIETIC IN A MULTIDISCIPLINARY FOLLOW-UP PROGRAM

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That patients undergoing hematopoietic stem cell transplantation (HSCT) face several stressful events during the treatment process that can directly and indirectly affect their quality of life. An interdisciplinary post-transplant follow-up program was started in a private hospital in the state of Rio de Janeiro, aiming at achieving a better quality of life. Assess the quality of life of patients undergoing HSCT; identify factors that may interfere with quality of life. The FACT-BMT questionnaire (divided into 6 categories) was applied to patients undergoing HSCT in a private hospital in Rio de Janeiro, registered in the integrated monitoring program. Through the statistical analysis of the questionnaires with the patients participating in the study, it was verified that the good interaction with the multidisciplinary team was associated with a better quality of life in 90.63% of the patients, as well as 55.21% with emotional well-being, 20.54% to physical well-being, 70.54% to functional well-being, 55.36% to social/family well-being, and 39.06% related to additional concerns. This corroborates for greater adherence to the therapeutic plan and guidelines performed. The assessment of quality of life when joining the multidisciplinary follow-up program will serve as a basis for future assessments and guide the work of the multidisciplinary team that will accompany patients.

Keywords: Hematopoietic stem cell transplantation. Quality of life. Oncology.

RETROSPECTIVE ANALYSIS OF THE REASONS FOR REMOVAL OF CENTRAL VENOUS CATHETERS IN PEDIATRIC PATIENTS UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT)

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a therapeutic modality widely used in the treatment of several malignant and non-malignant diseases, being considered a potentially curative treatment for diseases that until recently were considered incurable. To perform HSCT, there is a need for a prolonged hospitalization period, where the implantation of a central venous catheter (CVC) is essential. The CVC is a device indicated for long-term intravenous therapies, and should be carefully chosen, according to the profile of the patient, the type of HSCT, as well as the availability of the device in the service and team available for the implant.

Objective: To analyze the main reasons for removal of CVCs in patients undergoing pediatric HSCT.

Methodology: Observational retrospective cohort study in a children's cancer hospital, located in the interior of São Paulo, with HSCT recipients in the child and adolescent transplantation unit, from January 2012 to December 2020. All patients who implanted a central venous catheter specifically to undergo HSCT were included. Data were collected through review of medical records and recorded in the RedCap 11.1.18 platform and the analysis was performed by the IBM SPSS 27.0 for Windows program.

Results: The sample consisted of 181 CVCs implanted in the period. Of these, 114 (63%) were long-term CVCs and 67 (37%) were short-term CVCs. Among the long-term CVCs, 67% of them were Hickman CVCs, 33% CICC (central insertion central catheter). The most prevalent reasons for withdrawal in long-term CVCs were: elective withdrawal 20 (18%), followed by infection 16 (14%), suspected infection 11 (10%), fracture 9 (8%) and 11 (10%) obstruction 11 (10%). Regarding short-term CVCs, the most prevalent reasons were: elective withdrawal 36 (54%), followed by suspected infection 12 (18%), obstruction 6 (9%) and infection 2 (3%). Of the CVCs evaluated, in 34 (19%) of them the reasons for withdrawal were not found, being then classified as "reason not found".

Conclusion: The present study showed that, as expected, most CVCs are removed electively. Infection and suspected infection also appeared in both types of catheter, as a very prevalent reason for removal, raising the importance of process review and training. Attention is drawn to cases in which it was not possible to identify the reason for catheter removal, reinforcing the need for better recording of information in medical records.

Keywords: hematopoietic stem cell transplantation; central venous catheter; nursing;

ROLE OF NURSE NAVIGATORS IN A BONE MARROW TRANSPLANT CENTER IN THE STATE OF PARANÁ (BRAZIL)

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Introduction: The first patient navigation program was developed in 1990 in New York by American physician Harold Freeman. It was designed to reduce barriers to healthcare access. The Navigation Program was created to facilitate patient access to treatment by minimizing communication, information, financial, and emotional hindrances through promotion of effective listening and communication, establishing a relationship of trust between the navigator and the patient, and ensures continuity of care. Succeeding the implementation of the Hematology and Bone Marrow Transplant Center in the institution in 2020, the need for a nurse navigator in each phase of the treatment was identified: 1) Hematology nurse navigator, 2) Pre-hematopoietic stem cell transplantation (HSCT) nurse navigator and 3) Post-HSCT nurse navigator.

Objective: What is the relevance of the activities carried out by the nurse navigator in HSCT? Describe the activities of the nurse navigators in the Hematology and Bone Marrow Transplant Center.

Method: Experience reports of nurse navigators from a Bone Marrow Transplant Center in a reference hospital in southern Brazil.

Results: In the mentioned institution, there's a hematology nurse navigator who provides support, monitoring, chemotherapy guidance, and optimizes multi-professional follow-ups in conformity to each patient's needs. They provide information on post-hospitalization care, taking into consideration the patient's living conditions, and schedule post-discharge appointments. When a patient is medically indicated for HSCT, they are referred to the Pre-HSCT nurse navigator, who performs a medical record screening and schedules pre-transplant evaluations such as cardiology, anesthesiology, infectious diseases, dentistry, and psychology consultations. After blood bank validations, hospitalization scheduling is carried out according to the proposed conditioning. As part of the pre-transplant evaluation, a nursing consultation is conducted to provide advice to the patient and their family regarding the proposed treatment. When the patient is discharged, they are referred to the Post-HSCT nurse navigator, who provides follow-up care for up to 100 days after HSCT. This professional is responsible for tracking the patient, monitoring laboratory tests, and referring them back to the original medical professional when necessary. Additionally, they establish contact with patients through digital channels to address doubts and identify signs of graft-versus-host disease.

Conclusion: Through the actions of nurse navigators, we have achieved greater treatment adherence and patient safety, consequently reducing treatment delays and costs, and fostering a strong institution-patient relationship.

Keywords: Nurse navigator. Patient navigation. Hematopoietic stem cell transplantation. Cellular therapy. Oncology nursing.

SAFETY HUDDLE: EVALUATION OF THE TOOL IMPLEMENTATION IN A HEMATOPOIETIC STEM CELL TRANSPLANTATION INPATIENT UNIT

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Introduction: The hematopoietic stem cell transplant (HSCT) inpatient unit is a complex environment, and the patient safety is a frequent concern. In 2017, the Institute for Health-care Improvement proposed 9 tools to increase patient's safety, one of them is the huddle which is a daily quick meeting aiming to recognize situations that may interfere with the healthcare quality and to prevent adverse events. The tool can be an effective strategy to improve the quality of assistance, stimulating interactions between the multidisciplinary team. In this study, the huddle was defined as safety huddle (SH).

Objectives: To evaluate the implementation of the safety huddle tool in a HSCT inpatient unit.

Methods: Prospective, observational, cross-sectional, descriptive study, in an adult HSCT inpatient unit, between 07/2021 and 07/2022. Daily meetings were held from Monday to Friday, following the questions present in the tool (figure 1) about the last 24 hours.

Results: Two hundred and five meetings were held, with average length of 5.59 minutes. Multidisciplinary team members' attendance varied between professional categories (table 1). In 100% of the meetings, risk management protocols were updated and implemented (fall, phlebitis, and pressure injury), and related warning signs were observed in 7.4% of the days. Regarding the clinical aspects, in 186 of the days, at least one patient was considered potentially critical or instable (table 2). In 94.6% (194) of the days, patients needed unusual or high-risk infusion therapies, and blood components infusion. In the period, 293 patients received blood components transfusions and 50 received hematopoietic progenitor cells infusion. Premedication or exclusive medication through central venous catheter were necessary in 89% and 56% of the days, respectively. In 87.3% of the days there was some situation related to invasive devices that could potentiate the occurrence of complications, and in less than 2.2% of the days there was some warning sign in the daily assessment of the devices. Other situations that could lead to complications were also evaluated, as psychosocial aspects, dental evaluations and dietary issues (table 3). Regarding hospital discharge, in 97 days there was at least one patient expected to be discharged, of these days, 86 of them the discharge plan was implemented in advance. The discharge plan consists of a multidisciplinary team personalized planning with the patient and/or caregiver, regarding guidelines and home care after hospital discharge. The occurrence and notification of adverse events related to the patient were also evaluated (table 4), all of them were reported.

Conclusion: It is possible to note that the SH tool has been effective to promptly identify and may mitigate possible faults, as well as cooperate for the techniques, processes, and institutional protocols improvements, mainly in complex scenarios such as the HSCT unit.

Keywords: Nursing care. Safety huddle. Prevention. Quality. Adverse events. Hematopoietic stem cell transplant.

FIGURE 1 - Safety Huddle Tool

SAFETY HUDDLE		
Unit: HSCT inpatient unit	Date: ____/____/_____	Running time: _____ minutes

• Huddle Team: Nº Nurses ____ Nº Nursing technicians: ____ Nº Physiotherapists: ____ Nº Nutritionists: ____
Nº Physicians: ____ Nº Pharmaceuticals: ____Nº Psychologists _____ Nº Dentists_____

• Number of occupied beds: • Number of interdicted beds: • Number of hospital discharge projection:

Questions to the huddle team:	No	Yes	Which?
1. Risk management protocols were updated and implemented?			
2. Warning signs?			
3. Patients awaiting to start the protocol have some pending, tests or pre-medication?			( ) Pre HSCT ( ) Tests ( ) Pre medication ( ) Social problems ( ) Others: _____
4. Are there critical or unstable patients? There is any proposed care?			
5. Discharge			( ) Hospital discharge projection ( ) Hospital discharge plan has been started
6. High-risk or unusual therapies, procedures, protocols, or devices? (List what needs intervention)			( ) Transfusion ( ) Allergy history ( ) Exclusive medication by CVC ( ) ATG ( ) Pre medication ( ) Reconstitution and special dilution ( ) VP - Pure ( ) Water restriction ( ) Frozen HPC ( ) Others: _____
7. Kidney and/or liver failure requiring adjustment of medication doses? Dose adjustment needed after dialysis?			( ) Renal _____ ( ) Hepatic _____
8. Behavioral changes, addiction, impaired mobility, altered mental functions and/or social problems?			( ) Behavioral changes _____ ( ) High dependency _____ ( ) Mobility impairments _____ ( ) Altered mental functions_____ ( ) Social problems _____
9. Oral hygiene			( ) Impaired oral hygiene ( ) Prophylactic laser therapy ( ) Neutropenics with chlorhexidine prescribed ( ) Laser therapy to treatment ( ) Neutropenics without chlorhexidine in the room ( ) Mucositis ( ) Others: _____
10.Adverse events? Notifications? Total:_____ Notified:_____			( ) Loss of medical device _____ ( ) Lesion _____ ( ) Medication error _____ ( ) Phlebitis _____ ( ) Injury by medical device _____ ( ) Fall _____ ( ) Treatment delay _____ ( ) Diet _____ ( ) Others: _____
11. There are problems with infrastructure, equipment, materials or medications? Total:_____ Notified:_____			( ) Infusion pumps_____ ( ) Pharmacy_____ ( ) Syringe pump_____ ( ) Hotel business_____ ( ) Monitor_____ ( ) Air conditioning_____ ( ) Computer _____ ( ) Medical Gas Pipeline System_____ ( ) Printer_____ ( ) Computer systems_____ ( ) Others: _____
12. Dietary aspects			( ) Difficulties accepting the diet _____ ( ) Poor adherence to supplements _____ ( ) Need for dietary change _____ ( ) Diet progression _____ ( ) Weaning from parenteral diet _____
13. Invasive devices			( ) Phlogistic signs _____ ( ) Blood culture _____ ( ) Risk of phlebitis _____ ( ) Catheter removal_____

Comments:

TABLE 1 – Multidisciplinary team and the number of attended meetings

Professional	Nº of meetings	%
Nurse	205	100
Nursing technician	189	92.2
Physiotherapist	137	66.8
Nutritionist	176	85.9
Doctor	196	95.6
Pharmaceutical	122	59.5
Psychologist	77	37.6
Dentist	101	49.3
Occupational Therapist	15	7.3

TABLE 2 – Parameters used to assess the criticality of the patients clinical aspects

Clinical Aspects	Nº of days	%
Neutropenic without fever	102	49,8
Febrile neutropenic with antibiotic	150	73.2
Hypotensive	27	13.2
Hypertensive	69	33.7
Fluid retention and weight gain	73	35.6
Hypoxemic using oxygen	32	15.6
Others	2	1.0

TABLE 3 – Psychosocial, dentistry and dietary aspects

		Nº of days	%
Psychosocial aspects	Change of behaviour	51	24,9
	High dependency	34	16,6
	Mobility deficit	62	30,2
	Altered mental status	18	8,8
	Social problems	17	8,3
Dentistry aspects	Impaired oral hygiene	69	33,7
	Neutropenics with chlorhexidine prescribed for oral hygiene	148	72,2
	Neutropenics without chlorhexidine in room for oral hygiene	17	8,3
	Prophylactic laser therapy	177	86,3
	Laser therapy treatment	143	69,8
	Mucositis	161	78,5
	Other - Injury not related to mucositis	1	0,5
Dietary aspects	Difficulties accepting the diet	192	93,7
	Poor adherence to supplements	54	26,3
	Need for dietary change	108	52,7
	Diet progression	36	17,6
	Weaning from parenteral diet	28	13,7

Table 4 – Classification of notifications

Notifications	N	%
Loss of medical device	9	16,7%
Medication error	12	22,2%
Injury by medical device	12	22,2%
Treatment delay	6	11,1%
Lesion	1	1,9%
Phlebitis	3	5,6%
Fall	5	9,3%
Others	6	11,1%

THE IMPACT OF IMPLEMENTING BEDSIDE MONITORING OF CENTRAL VASCULAR ACCESS ON CATHETER-RELATED BLOODSTREAM INFECTION RATES IN A PROTECTED ENVIRONMENT UNIT: BEFORE-AFTER STUDY

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Introduction: The monitoring of central vascular accesses is one of the strategies that integrate the best practices used to measure the performance of interventions related to the maintenance of intravenous therapy devices[1]. This practice allows the early identification of processes that can be improved or optimized among the multidisciplinary team, which directly affects the prevention of bloodstream infections associated with vascular catheters.

Objective: To describe the results of the implementation of bedside monitoring of all types of central venous catheter (CVC) used in a protected environment unit (PEU) of a public university hospital in the South of the country.

Methods: Before-and-after study. The period analyzed before the intervention was from January 2019 to December 2021 and, after the intervention, from January to December 2022. The trained nurse linked to the Vascular Access Program (VAP) performs weekly bedside monitoring with the following observations: dressing aspect, presence of phlogistic signs at insertion, stitches and/or fixation devices, expiration date of infusion sets and connections, type of CVC and routes in use or salinized. The variables related to the catheter insertion procedure are collected from medical records. All data is included in the Research Electronic Data Capture-REDCap program. Each catheter is given an identification number and is followed until its date of removal or the patient's discharge from the catheter. The study was approved by the Research Ethics Committee of the Institution, under CAAE No.: 9223119400005327.

Results: A total of 1884 monitorings were performed from January 2019 to December 2022, with a mean of 39.25 catheters/month. In 2019, the annual target of the CVC-related Primary Bloodstream Infection (PBSI) indicator in PEU was 2.9 infections per 1000 catheter/day, however, 3.49 infections per 1000 catheter/day were observed. The following interventions were implemented: in-person/online training focused on hand hygiene and good practices in the handling of venous accesses, development of protocols for recommending catheters according to the estimated time of use and chemotherapy protocols. In 2022, after the implementation of these actions, we observed the reduction of the PBSI index to 2.68 infections per 1000 catheter/day, still above the stipulated target of 2.5 infections per 1000 catheter/day.

Conclusions: The monitoring and interventions carried out led to the reduction of PBSI, in addition to reinforcing the importance of VAP monitoring activities in the PEU.

Keywords: Nursing Care. Central Venous Catheters. Catheter-Related Infections.

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THE RISK OF FALL IN PATIENTS UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Hematopoietic stem cell transplantation (HSCT) is characterized by high complexity, the risk of falls is high and knowing risk factors and/or causes is essential to prevent and reduce damage from these incidents.

Objectives: To describe the frequency of falls among patients in an HSCT unit and to present the main preventive measures. Methodology: This is a descriptive study about the frequency of falls in a public HSCT unit and preventive measures taken in the period from 2021 to 2022. The data comes from the notification forms sent to the Patient Safety Center in this period.

Results: During the study period, a total of 184 HSCT were performed and in this period 8 falls occurred, reflecting a fall rate of 4.87%. Studies indicate that in hospitals of developed countries this rate varies between 3 and 5 falls per 1,000 patients/day, highlighting the importance of preventive measures in HSCT units. The causes of falls in hospitals are multifactorial, involving environmental and individual risk factors. The analysis of the notifications sent to the Safety Center identified as the main causes in the period: poor assessment of the patient's fall risk by the team and lack of preventive measures; and low patient and/or companion adherence to preventive measures. That demanded the following: assessment of the risk of falling; identification and signaling at the bedside and wristband; supervision of personal hygiene care; medication review; education of preventive measures for patients and caregivers; recording of the occurrence of falls and interventions the possible causes; guidance and supervision to the use of devices/equipment; safe allocation of equipment/devices to facilitate movement and exit from bed; guidance to the patient and companion to leave the bed accompanied by a team professional; continuous training of the team on the measures.

Final considerations: The implementation and compliance with safety protocols for fall prevention can prevent falls. Therefore, a preventive action focused on patient safety can reduce the risk and minimize the damage resulting from a fall, promoting quality care. Descriptors: Falls; Risk; and Hematopoietic Stem Cell Transplantation.

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THE ROLE OF A DIRECT COMMUNICATION CHANNEL BETWEEN PATIENT/FAMILY AND THE TRANSPLANT TEAM.

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a complex procedure in which patients and their families are faced with several challenges. The patient/family need constant support and clarification of the entire HSCT process. The contact with the professionals through fix telephone numbers and/or e-mail can be very challenging. Many issues can also be resolved with direct communication instead of transportation to the medical center, that is expensive and time consuming. Communication strategies between patient/family and team can help in the early management of patient/family needs. WhatsApp is the most popular instant messaging social network among Brazilians and completely free if used with an open Wi-Fi access. In October, 2021, a new communication tool was implemented in the HSCT service, a cellular telephone with WhatsApp that is used daytime by nurse practitioners and at night by one of the attending physicians. All patients and their families have direct access to the team through this WhatsApp number.

Objective: To analyze the use of the "on-call WhatsApp" by patients and by the healthcare team in all stages of HSCT.

Method: Retrospective analysis of all contacts made by the patients/families.

Results: From October 09, 2021 to March 16, 2023, 451 contacts were made through our WhatsApp: 68% of the messages were from patient/family, 28% from the team to patient/family and 4% from the physician referring the patient to the HSCT service.

The reasons for contact of patients/families were 52 (12%) HSCT-related complications, 32 (7%) medical appointment, 29 (6%) requests summary, 21 (5%) clarification about medications, 20 (4%) about post-HSCT vaccination, 19 (4%) about test results, 15 (3%) about COVID PCR, 14 (3%) request of prescriptions, 12 (3%) questions regarding pre-HSCT, 11 (2%) regarding the donor, 11 (2%) regarding the insurance, and 11 (2%) regarding the Respiratory Unit. The most common symptoms reported using the WhatsApp were gastrointestinal (15; 29%): diarrhea, vomiting, nausea, abdominal pain and inappetence. All patients who sent messages had and answer from the team for prompt management of the clinical problems.

Conclusion: This is an excellent option for prompt communication with the patients, avoiding several unnecessary visits. Patients, physicians and nurse practitioners continuously use the "on-call WhatsApp" pre and post appointments. It is also a very valuable tool to reach out patients for the post-HSCT follow-up.

HEMATOPOIETIC STEM CELL TRANSPLANTATION IN INFUSION PUMP: INTEGRATIVE REVIEW

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Introduction: The occurrence of lytic effects in transfusions of blood components is attributed to the size and width of the catheter, infusion rate and method, in addition to physical properties such as viscosity and storage time[1]. The use of infusion pumps (IP) are linked to cell injury and are responsible for plasmatic release of markers such as free hemoglobin and potassium[2]. However, in hematopoietic stem cell transplantation (HSCT) strict control of hematopoietic stem cell (HSC) infusion is essential to avoid or minimize adverse events. Thus, it becomes imperative to highlight safe HSC infusion practices and processes.

Objective: Search scientific evidence about cell viability, safety, and efficacy of grafting in HSC infusion in IP.

Methods: Integrative literature review with the acronym PCC; Problem-cell viability and/or grafting, Concept-infusion of HSC in BI and Context-HSCT; for identifying key topics. Searches were carried out in May 2023 in Cochrane, *Biblioteca Virtual em Saúde* (BVS), Embase, National Library of Medicine (PubMed), Scopus and Web of Science (WoS) databases. The Descriptors were: Hematopoietic Stem Cell Transplantation, Bone Marrow Transplantation and Infusion Pumps in Portuguese and English, Boolean operators "AND" and "OR" were adopted in the search strategies (TABLE 1). Studies published from January 1990 to April 2023 were included. Results were sorted, excluding duplicates, and managed with Mendeley® reference software. After reading the titles and abstracts, studies were selected for full reading.

Results: Of the 89 results, after exclusions, six were included in the review (FIGURE 1). Three studies used thawed HSC in in vitro research, the others used different sources of HSC in autologous and allogeneic HSCT. One study used a syringe IP, the others used different volumetric IP brands, only one study specified the pressure exerted by the equipment. None of the studies showed a significant difference in cell viability or neutrophilic and/or platelet engraftment time with IP for HSC infusion, indicating safety in the method. Table 2 presents the summary of the included studies. Regarding complications, one of the studies reports the occurrence of volume overload during HSCT by IP in 22 patients (n=114), which was corrected by the team with administration of diuretics and decrease in infusion rate (A2). In gravitational infusion, one of the studies reports the need to transfer thawed HSC to a syringe for manual infusion in two patients (=73) due to slow infusion rate (A6). Five studies recommend the use of IP for HSC infusion.

Conclusion: The results indicate safety and efficacy in the use of IP for HSCT. However, due to the number of studies found and part of them being carried out in vitro, further in vivo studies on the subject are needed.

Keywords: Hematopoietic Stem Cell Transplantation. Bone Marrow Transplantation. Infusion Pumps. Nursing. Cell Survival.

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USE OF LASERTHERAPY IN ONCOHEMATOLOGICAL PATIENT UNDERGOING BILATERAL CANTOPLASTY

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Introduction: Canthoplasty is a surgical procedure performed to treat onychocryptosis, in which the side of the nail is removed vertically up to the matrix so it can grow properly. As it is a possible source of infection, treatment of onychocryptosis is essential before procedures such as Hematopoietic Stem Cell Transplantation (HSCT). Healing of canthoplasty occurs in 7 to 10 days, but it may take longer in oncologic patients. Low-intensity laser therapy (LLLT) adds many benefits to postoperative management, such as reducing the acute inflammatory process and facilitating the organization of collagen fibers and the production of fibroblasts, accelerating healing.

Objectives: To report the experience of hematology nurses in the use of LLLT after canthoplasty in a patient with multiple myeloma hospitalized for HSCT in a hospital in south Brazil. Materials and methods: This is an experience report using technology associated with individualized patient nursing care.

Results: Male patient, 46 years old, diagnosed with Multiple Myeloma kappa light chain, hospitalized for autologous HSCT. He was on the 4th postoperative day (PO) of bilateral canthoplasty, waiting for healing of the surgical wounds to start the conditioning. Due to the slowness of the healing process, he was evaluated by the hematological nursing team, specialist in wounds and injuries, with the indication of starting LLLT. Initially, the surgical wound was deep with irregular edges and the presence of erythema. A 2-joule red laser was applied every 48 hours at equidistant points of 1 cm each, totalizing 5 points on both sides. During the 3rd session, purulent secretion was noted in the right hallux, opting for the incorporation of the PDT technique, which constitutes in the association of a photosensitizer to laser therapy. Six sessions were performed, progressing with resolution of the secretion and healing of the treated area. In this way, there was full recovery of the skin, which made it possible to follow the therapy with the start of conditioning.

Conclusion: The skin specialist nurses`s performance in caring for onco-hematological patients benefited individualized treatment, favoring the patient's recovery and enabling healing, properly using technology, and ensuring the continuity of the steps for performing HSCT.

USE OF ONLINE TOOL FOR TRAINING AND QUALIFICATION OF PROFESSIONALS WORKING IN A PEDIATRIC HEMATOPOIETIC STEM CELL TRANSPLANTATION UNIT

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a therapeutic option for several malignant and non-malignant diseases. This is a very complex therapeutic option, which requires highly qualified professionals to work in this area. However, training and qualifying professionals to work in HSCT is a very challenging process, which requires time and availability of other professionals, who have experience and expertise, to contribute to the training of new professionals. Faced with this difficulty, online courses have gained space and wide acceptance, due to the ease and optimization of time, making training more dynamic and accessible. With the expansion of a pediatric HSCT unit in a children's and adolescent oncology hospital, located in the interior of the state of São Paulo, the need to hire a high number of professionals brought with it the concern to carry out the formation and training of new employees. Therefore, after a great planning, an online introductory course was developed, with subjects related to HSCT, in order to train these new professionals and secondarily also train other professionals, such as medical residents and multiprofessional residents during their stay in the transplant unit. Objective: To describe and present the experience of creating an online introductory course, directed to the care of pediatric patients submitted to HSCT, in order to train and qualify the new professionals involved in this care.

Methodology: This is a described, retrospective study. Developed in a pediatric HSCT unit. Results: The creation of the online course of introduction to HSCT was basically divided into three stages. The first step was the definition of themes and the definition of professionals with expertise to record the class in each specific subject. The second step was the alignment with the recording team, definition of the layout of the platform where the course would be inserted, recording and editing of the classes. The third and final stage was the validation of each class, by a committee of professionals with experience in the area, where the content was evaluated and eventual adjustments were made. The course content was composed of sixteen themes, related to HSCT, focusing on the pediatric population, with an average duration of 20 minutes per class.

Conclusion: The use of the online tool for the training and qualification of professionals working in pediatric HSCT proved to be very effective and with wide adherence. One of the main advantages was the opportunity for each professional to be able to access each class more than once, thus making it possible to consolidate learning.

Keywords: hematopoietic stem cell transplantation, health education and pediatrics.

PHARMACY

ANALYSIS OF CONDITIONING AND IMMUNOPROPHYLAXIS REGIMENS FOR THE PREVENTION OF GRAFT VERSUS HOST DISEASE (GVHD) IN PATIENTS WITH FANCONI ANEMIA UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION IN A TERTIARY PUBLIC HOSPITAL

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Introduction: Fanconi anemia (FA) is a hereditary, autosomal recessive disease and the most frequent genetic cause of bone marrow aplasia. In addition, it is associated with the development of malignant neoplasms and congenital abnormalities, which can culminate in death. Hematopoietic Stem Cell Transplantation (HSCT) remains the treatment of choice for FA, however, the success of this procedure varies according to risk factors related to the patient, the graft, as well as the conditioning and immunoprophylaxis regimens used.

Objective: To analyze patient profile, conditioning and immunoprophylaxis protocols for the prevention of Graft-versus-Host Disease (GVHD) in patients with Fanconi Anemia undergoing allogeneic HSCT in a tertiary public hospital.

Methods: This is a retrospective quantitative and qualitative study in which the conditioning and immunoprophylaxis regimens, elaborated between January 2018 and December 2022, were analyzed. The study was approved by the Research Ethics Committee (CEP) under opinion nº 51881821.8.0000.0096.

Results: A total of 68 conditionings carried out in the proposed period were analyzed. The predominant age group (83.82%) was 1 to 18 years old (median 9 years old; total range 1 to 45 years old), and there was no predominance between sexes. Among the conditioning regimens performed, the three most frequent combinations were: fludarabine (FLU) 150 (±6.3) mg/m^2, cyclophosphamide (CFA) 60 mg/kg/total, same 160% dose of CFA, and thymoglobulin (ATG) 5 mg/kg (n=32; 47.06%); followed by FLU 150 (±6.3) mg/m^2, alemtuzumab 0.66 mg/kg/total, and total body irradiation (TBI) (n=15; 22.06%); and FLU 150 (±8.6) mg/m^2, TBI, and ATG (n=10; 14.70%). In immunoprophylaxis, the three most common regimens were: cyclosporine (CSA) 4 (±0.8) mg/kg/day from D-2 and methotrexate (MTX) 15 mg/m^2 on D+1 and 10 mg/m^2 on D+3, D+6, D+11 (n=27; 40.30%); followed by CFA 50 (±12.4) mg/kg/total on D+3 and D+4, same as 160% of the CFA dose, CSA 4 (±0.38) mg/kg/day from D+5, mycophenolate mofetil (MMF) 40 (±9.3) mg/kg from D+5, with or without granulokine (n=20; 29.85%); and CSA 4 (±0.5) mg/kg/day from D-2 and MMF 42 (±10.8) mg/kg/day (n=11; 16.42%).

Conclusions: Considering the predominance of FLU among the most frequent conditionings, studies suggest that the addition of FLU to conditionings containing CFA at a dose of 60 mg/kg is considered a protective factor for unfavorable clinical outcomes in patients with FA after HSCT, contributing to improving overall survival. Still, the most frequent conditioning in the present study corroborates findings in the literature, in which this combination was the most prescribed, despite smaller doses than that of the present study. Regarding the prophylaxis scheme, MTX proved to be safe at doses of 3 to 15 mg/m^2 in the prevention and treatment of GVHD in transplant patients. In this context, different combinations and doses were used, highlighting the need to harmonize such regimens to establish an effective standardized strategy for the treatment of FA.

Keywords: Fanconi anemia. Hematopoietic Stem Cell Transplantation. Conditioning. Immunoprophylaxis.

CONDITIONING REGIMEN OF HEMATOPOIETIC STEM CELL TRANSPLANTATION IN HODGKIN'S LYMPHOMA PATIENTS: DRUG ACQUISITION AND USE IN UNIVERSITY HOSPITAL OF SOUTH BRAZIL

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Introduction: Lymphomas are neoplastic transformations of normal lymphoid cells, located predominantly in lymphoid tissues. Non-Hodgkin's and Hodgkin's lymphoma are the two lymphoma's types according to morphology. Autologous bone marrow and/or hematopoietic stem cell transplantation (HSCT) are the treatments of choice in these cases with good chances of cure. The most used conditioning regimen in Hodgkin's lymphoma patients is BEAM (carmustine + etoposide + cytarabine + melphalan) due to its efficient and tolerable effects. However, carmustine discontinuation in the Brazilian trade has affected the treatment of thousands of patients.

Aim: This study aimed to describe the pharmacist's perception about drugs used in the conditioning regimen of HSCT in Hodgkin's lymphoma (HL) patients assisted in University Hospital of the South Brazil.

Methodology: Evaluation of the different treatment schedules of HL used in the routine of the Center of Hematopoietic Stem Cell Transplantation of tertiary hospital, its correlation with acquisition and literature data.

Results: Many treatment schedules are used in the HSCT. The BEAM protocol is the first-choice regimen in lymphoma's patients attempting in this hospital. Carmustine, however, had its production interrupted in 2017 in our country. In this case, its use depends on importation with increasing product costs and delivery time. Other option includes the replacement of carmustine by lomustine in the LEAM protocol (lomustine + etoposide + cytarabine + melphalan). Comparative studies between these protocols showed similar toxicity, but higher progression-free survival and overall survival with BEAM regimen.

Conclusion: The importation necessity of drugs impacts treatment schedule choice and the survival of lymphoma's patients submitted to HSCT. Other studies should be conducted to obtain therapeutic options with better results in this context.

Keywords: Lymphomas. Conditioning regimen. Hematopoietic stem cell transplantation.

OPTIMIZATION OF THE USE OF BUSULFAN IN THE CONDITIONING OF HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Intoduction: The use of busulfan, an alkylating chemotherapeutic agent, in hematopoietic stem cell transplantation (HSCT) conditioning protocols is consolidated in the literature and in clinical practice. Knowing the pharmacokinetic models of the population has been one of the strategies adopted to optimize its use. Some studies have already shown that this chemotherapy drug has favorable pharmacokinetics for its use every 6 hours or every 24 hours, which in clinical practice brings the possibility of improving the care process and patient safety related to medication errors.

Objective: Optimize the use of busulfan based on its pharmacokinetics in allogeneic HSCT.

Method: Observational study, of the experience report type, carried out from May 2022 to May 2023 in a reference teaching hospital. After reviewing the literature and based on the consolidated use of busulfan with once-a-day dosage in some HSCT conditioning protocols, this optimization strategy was expanded to the other protocols used in the Institution, aiming at improvements for the care team (doctors, nurses and pharmacists). The dosage was initially changed from administering 0.8mg/kg every 6 hours to 1.6mg/kg every 12 hours, noting that this change did not bring negative outcomes, the dosage was changed again to 3.2mg/kg every 24 hours.

Results: In the evaluated period, improvements were observed in the care aspect, with a view to optimizing the flow of prescriptions, manipulation of chemotherapy and administration, reducing the probability of medication errors. Positive clinical impact, with no increase in the incidence of adverse reactions after the change, despite the fact that serum levels of busulfan were not measured. Regarding pharmacoeconomic aspects, we can conclude that changing the dosage of busulfan in the conditioning protocols, considering an average weight of 70Kg and a daily dose of 3.2mg/kg, brought about a reduction in costs for the institution. Knowing that for each day of use of busulfan with a dosage of four times a day, the preparation of the bags generates a direct cost of R$ 3588.68 and this value drops to BRL 3552.10 for the manipulation of the medication with a dosage of once a day, which represents a saving of BRL 36.58 per day. If we consider a myeloablative conditioning (MAC), with 4 days of busulfan, this value represents BRL 146.32 per patient, in conditioning of reduced intensity (RIC), with 2 days of busulfan, this value represents R$ 73.16 per patient. In the period, 28 HSCT were performed, 19 MAC and 9 RIC, which generated a cost reduction of BRL 2780.08 in MAC and BRL 658.44 in RIC.

Conclusion: The modification of the busulfan dosage to a single daily dose in the HSCT conditioning protocols brought clinical, assistance and economic improvements to the institution, which optimizes the logistical process and patient safety.

Keywords: Hematopoietic Stem Cell Transplantation. Pre-Transplant Conditioning. Posology. Patient safety.

PERCEPTION OF THE PHARMACEUTICAL CARE PROVIDED BY A MULTIDISCIPLINARY RESIDENT IN A BONE MARROW TRANSPLANT CENTER IN THE INTERIOR OF THE STATE OF RIO GRANDE DO SUL

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Introduction: Pharmaceutical care emerged as a model of pharmaceutical practice that ranges from ethical values, skills, attitudes, commitments to co-responsibility with the user, always bearing in mind that the main beneficiary of these actions is the patient himself.

Objective: The aim of this study was to describe the perception's resident pharmacist about pharmaceutical care in the Bone Marrow Transplant Center (BMTC) of university hospital in the south of the state of Rio Grande do Sul and to compare with literature.

Method: Evaluated in the literature database the evolution of pharmaceutical care and to correlate with resident pharmacist actuation in the BMTC of a tertiary hospital.

Results: Pharmaceutical care, over the years, has undergone changes in its way of acting. This change occurred after the rise of Pharmacy in the time of the old apothecaries, which declined with the emergence of the pharmaceutical industries. Subsequently, the clinical pharmacy movement marked the beginning of a new era in pharmaceutical education and practice with the emergence of the clinical pharmacist, turning his care to the patient. This change was important in rescuing the pharmacist's social function, which ceased to act only in dispensing medication, bringing comprehensive care to the forefront. Thus, this profession gained new perspectives in society. Pharmaceutical care consists of a model of professional practice that involves the responsible provision of pharmacotherapy with the purpose of achieving concrete results in response to the prescribed therapy in order to improve the patient's quality of life. It also seeks the prevention and resolution of pharmacotherapeutic problems, in a systematic and documented manner. In this new direction we have a huge way to go. The importance of clinical pharmacy has been a consensus for several decades, praising the importance of the clinical pharmacist within hospital units. However, there was the lack of a clinical pharmacist in several hospitals, such as the teaching hospital, where I carry out my multidisciplinary residency. Clinical pharmacy is much more than just assembling and structuring drug maps for hospital discharge. It involves the pharmaceutical consult before the start of treatment (anamnesis) until to the pharmacotherapeutic follow-up. It also includes to checked by side effects related to drug use, its serum levels, as well as drug-drug and/or drug-food interactions. Conciliation e reconciliation medication also were activities development in this sense.

Conclusion: Concluding, all health units would evolve more satisfactorily with the inclusion of Clinical Pharmacists in their multidisciplinary team.

Keywords: Pharmaceutical care. Multiprofessional residency. Bone marrow transplant center.

PROBLEMS RELATED TO DRUGS AND PHARMACEUTICAL INTERVENTIONS IN PATIENTS SUBMITTED TO AUTOLOGOUS STEM CELL TRANSPLANTATION: THE ROLE OF THE CLINICAL PHARMACIST IN A MULTIDISCIPLINARY TEAM

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a complex therapy whose success directly involves the work of a multidisciplinary team. Pharmaceutical monitoring of patients aims to ensure that medications are properly indicated and that they are effective, safe and convenient. Its main objectives are to detect, resolve and prevent drug-related problems (DRPs) and provide the multidisciplinary team the support for decision-making. Considering that patients undergoing HSCT use many medications, the effective management of therapeutic regimens becomes essential.

Objectives: To analyze the identified DRPs and the pharmaceutical interventions (PI) performed on patients who underwent autologous HSCT, as well as their acceptability by the multidisciplinary team.

Method: Retrospective study, describing the profile of DRPs and PI suggested by the clinical pharmacy in Hematology/HSCT Service at Hospital Nossa Senhora da Conceição (HNSC) from 2021 to 2023 on patients who underwent autologous HSCT. Detection of DRPs was performed by monitoring patients and using information available in the medical records. Databases were used to classify DRPs and the Common Terminology Criteria for Adverse Events v 5.0 was used to grade adverse reactions. For the descriptive analysis, frequencies, means and standard deviation were calculated.

Results: A total of 22 patients were followed, most of whom were male (68.2%; n=15). The mean age was 56.6 years (SD=10.7; 31 to 72 years). Patients used an average of 4.3 medications before HSCT. Only three patients had no previous comorbidities and 14 (63.6%) were hypertensive. The most used conditioning protocol was Melphalan 200mg/m2 (n= 14). 113 DRPs were identified (about 5 problems per patient), which generated a total of 61 pharmaceutical interventions. The main problem encountered was the occurrence of adverse reactions (52.2%; n=59), followed by the need to include additional medication (15%; n=17), the need for dose adjustments (3.6%; n =4) and guidance regarding the scheduling or preparation of medications (3.6%; n=4). The most frequent adverse reactions were mucositis (n=17) and febrile neutropenia (n=17). Out of the proposed interventions, 55 were accepted by the team (90.2%), 6 were not accepted (9.8%) and in 56 there was no need for acceptance or changes in the prescription or administration of medications (informative interventions).

Conclusions: Through the characterization of DRPs, as well as the interventions carried out, it becomes possible to solve them, optimizing outcomes and promoting the review of medications used by the patient. In this way, the role of the pharmacist in the multidisciplinary team, especially in HSCT is consolidated in regards to patient safety, treatment effectiveness, service quality and cost reduction, thus justifying this work.

Keywords: Hematopoietic stem cell transplantation, clinical pharmacy, pharmaceutical intervention.

SAFE ADMINISTRATION OF VENCLEXTA (VENETOCLAX) FILM-COATED TABLETS IN PATIENTS WITH SWALLOWING DIFFICULTIES: MAIN CHALLENGES IN PHARMACEUTICAL ADAPTATION

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Introduction: Venetoclax is a chronic use oncology medication available in film-coated tablets, which according to the package insert should not be crushed. The availability of only one pharmaceutical formulation limits its use in patients with swallowing difficulties, those using nasoenteral tubes, and pediatric patients, requiring the adaptation of the pharmaceutical form. The pharmacokinetics and absorption of medications can be altered by crushing, leading to reduced efficacy or increased adverse events related to changes in bioavailability. Recently, in our professional practice, it became necessary to develop the adaptation of the venetoclax tablet for a post-bone marrow transplant pediatric patient. In this context, we observed a lack of data to support the approach and provide guidance on the dilution method employed.

Objectives: To verify the existence of scientific studies demonstrating the safety and efficacy of crushed venetoclax tablets.

Methodology: Literature review, database: PUBMED.

Keywords: Venetoclax; tablet crushing; boolean operators "AND" used as search strategy. The search was conducted in May 2023. Results: Three publications were found, including two case studies (2022) and one dissolution profile article for crushed tablets (2023). Both case studies evaluated adult patients. The patient who used crushed medication due to swallowing difficulties had an increased plasma concentration of venetoclax (Cmin) compared to intact tablets. Additionally, the patient experienced severe and prolonged neutropenia while using the crushed tablet, an adverse event possibly related to increased bioavailability of venetoclax. In the other case study, crushed venetoclax was administered via a nasogastric tube, with no significant differences in the pharmacokinetic profile of the crushed drug. It is worth noting that this research was the only one to describe the method of medication adaptation, reporting immediate administration with crushing at the bedside using a mortar and warm water. The last study demonstrated a significant alteration in the dissolution profile of crushed venetoclax, increasing its dissolution rate. This aspect may explain the increased absorption and elevation of serum concentration reported in the previous study, exposing the patient to a higher risk of adverse events.

Conclusion: Pharmaceutical adaptations can be used as strategies to maintain treatment and promote adherence to pharmacotherapy; however, they must be carried out rationally to ensure the safety and efficacy of the medication. The studies provide limited and conflicting information regarding the safety of crushed venetoclax tablets. Therefore, more robust research is needed to fill this knowledge gap and adequately guide practice.

Keywords: venetoclax. tablet crushing. drug administration via tube.

THE IMPACT OF MELPHALAN SHORTAGES ON ONCO-HEMATOLOGY PATIENTS

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a therapeutic modality used in the treatment of malignant hematological disorders, such as Multiple Myeloma, Hodgkin's and Non-Hodgkin's Lymphomas and subtypes of Leukemias. According to the Brazilian Association of Organ Transplantation, a total of 3,826 bone marrow transplants were registered, with 10.32% (n=395) performed in Paraná. The process involves mobilization, monitoring of cell counts, collection, cryopreservation, and conditioning, which includes high-dose myeloablative chemotherapy and/or radiotherapy. The Brazilian Consensus on Hematopoietic Stem Cell Transplantation indicates that in certain protocols, the combination with other alkylating agents did not demonstrate significant advantages compared to the alkylating agent Melphalan. Consequently, Melphalan is widely used in 80% of institutional hematological protocols.

Objective: This study aims to review the possible causes of Melphalan shortage and its impact on oncology hospitals.

Methods: This is a descriptive study supported by a literature review. Articles were selected based on their discussion of the impact and causality of antineoplastic drug shortages, using the keywords "Melphalan" and "shortage." The search included articles published between 2002 and 2022.

Results: Melphalan, belonging to the class of strategic oncological drugs, is experiencing shortages, posing a significant risk to the hospital system and onco-hematology patients. This shortage issue is not limited to Brazil, as several countries are facing similar challenges. The scarcity is caused by a lack of raw material supply, controversies surrounding quality control, and/or insufficient production to meet the demand. As a result, patients undergoing HSCT may experience prolonged waiting periods or require alternative hematological protocols. For instance, the LACE protocol (Lomustine, Cytarabine, Cyclophosphamide, and Etoposide) is used as a therapeutic alternative for conditioning in Hodgkin's Lymphoma. Additionally, the scarcity of Melphalan has non-clinical repercussions, such as increased medication costs, affecting both the healthcare team and the patients themselves. Oncologists have also highlighted the lack of formal guidance in managing this situation, considering its recurrent nature. Urgent solutions are necessary to prevent the recurrence of such shortages, as patients' lives are at stake.

Conclusion: Medication shortages, which involve disruptions in the supply of pharmaceutical products, can have severe implications for treatment continuity. Alterations in recommended therapeutic regimens, known to be more effective, can impact the quality and safety of healthcare, resulting in longer waiting times for HSCT patients with poor prognoses or the need to resort to alternative treatment protocols. It is crucial to find urgent solutions to prevent the recurrence of these shortages, as the lives of patients are at risk.

Keywords: Hematopoietic Stem Cell Transplantation, Melphalan, Shortage.

USE OF MYCOPHENOLATE MOFETIL IN IMMUNOPROPHYLAXIS PROTOCOLS FOR HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT)

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Introduction: One of the main complications in patients undergoing Hematopoietic Stem Cell Transplantation (HSCT) is Graft Versus Host Disease (GVHD), which accounts for 10-20% of mortality in acute cases. For this reason, HSCT requires protocols with drugs that prevent this condition. With the aim of minimizing post-HSCT complications, recent prophylactic strategies include the use of mycophenolate mofetil (MMF) associated with calcineurin inhibitors such as cyclosporine or tacrolimus.

Objective: This study sought to quantify the use of mycophenolate mofetil as immunoprophylaxis in patients undergoing HSCT in a tertiary public hospital in southern Brazil.

Method: This is a retrospective observational study carried out through the analysis of HSCT conditioning maps, which comprised the conditioning and immunoprophylaxis protocols of patients in a public hospital, prepared between January 2022 and May 2023. The study stratified the baseline diseases of the patients, route of administration, and date of introduction of mycophenolate mofetil in immunoprophylactic pharmacotherapy. Data analysis was performed by plotting them on an online electronic data sheet. The Research Ethics Committee under opinion n º 51881821.8.0000.0096 approved the study.

Results: Of the 160 regimens analyzed, 62 (38.5%) contained MMF, the majority (n=18, 29.03%) for Severe Aplastic Anemia (SAA), followed by Fanconi Anemia (n=16, 25.30%) and Acute Lymphoblastic Leukemia (n=4, 6.45%). Regarding the route of administration, 50 (80.65%) regimens presented the oral route for the use of MMF, while for the intravenous route, 12 (19.35%) maps were identified. This fact is related to the difficulty of acquisition and the need to import the intravenous pharmaceutical form, in addition to organizing the service so that patients could undergo the treatment on the same day, in order to maximize the use of leftovers in each bottle and guarantee the administration of MMF to all patients. For the most part (n=51, 82.26%), the beginning of MMF use was concentrated on D+5 of HSCT.

Conclusions: The use of mycophenolate mofetil has been widespread in HSCT. However, a comparative evaluation of the efficacy and safety results of other immunoprophylaxis protocols that apply different pharmacological strategies is necessary.

Keywords: Graft Versus Host Disease. Hematopoietic Stem Cell Transplantation. Mycophenolate mofetil.

PHYSIOTHERAPY

CASE REPORT: PHYSIOTHERAPY INTERVENTION WITH ENDURANCE IN PATIENTS AFTER BONE MARROW TRANSPLANTATION WITH THE AID OF VIRTUAL REALITY

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Introduction: Virtual reality (VR) has been inserted and has been gaining prominence in the field of physiotherapy, being an innovative tool that allows the user to be isolated from the real world and interact with an activity in the virtual world, thus achieving sensory feedback on the movement performed in the virtual environment, increasing patient interaction and motivation. VR acts both in physical and cognitive recovery, by reducing body perception disorders, especially pain, and improving movement. It is a new and effective tool that can distract patients from their daily lives; thus also being able to contribute to the improvement of the quality of life and reduction of the undesirable effects of the oncological treatment.

Objective: The present research was to verify the individual's opinion in endurance training with the aid of virtual reality in the post bone marrow transplantation, the method is a research characterized as observational.

Method: This is a case report in order to understand the applicability of virtual reality in the rehabilitation process. The information contained in this work was obtained through a review of the medical records and an interview with the patient submitted to virtual reality.

Case report: Male patient, 26 years old, diagnosed with neoplasm of the right testicle – non-seminomatous tumor with lung, liver and lymph node metastasis, undergoing endurance training with the aid of virtual reality after bone marrow transplantation in 2023. Physiotherapeutic care started after bone marrow transplantation with endurance training on a cycle ergometer for ten minutes with the aid of virtual reality with BOBOVR Z6 Bluetooth glasses 3D helmet VR glasses and associated virtual reality headset.

Results: The intervention protocol positively affected the patient who reports an innovative and different experience, an important effect promoted by virtual reality is the possibility of patient interaction with the virtual environment, it favors immediate feedback from the patient, since it obtains answers favorable and immediate results of the effectiveness of their movements.

Conclusion: Virtual reality seems to be a new and effective tool that can divert the patient's attention from their day-to-day activities; it can thus also contribute to improving the quality of life and reducing the undesirable effects of cancer treatment.

PHYSIOTHERAPY EVALUATION PRE AND POST TRANSPLANTATION OF HEMATOPOIETIC STEM CELLS IN A REFERENCE INSTITUTION IN THE INTERIOR OF SÃO PAULO

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INTRODUCTION: HSCT treatment is often accompanied by physical and functional decline, a decrease in psychological well-being and in the level of physical activity. The assessment of the patient's physical and functional capacity can serve as a predictive value for adverse clinical outcomes with HSCT treatment, as well as being used in association with other health indicators to determine the effectiveness and efficiency of therapeutic interventions. In view of this, the assessment by the physiotherapy team is of paramount importance in order to assess the physical and functional capacity, and physical aspects related to HSCT, to identify the patient's profile and kinetic-functional needs, for monitoring and intervention on possible factors. risk for declines in functionality.

OBJECTIVE: To describe the physiotherapeutic evaluation protocol for patients who are candidates for HSCT in a reference center in the interior of São Paulo.

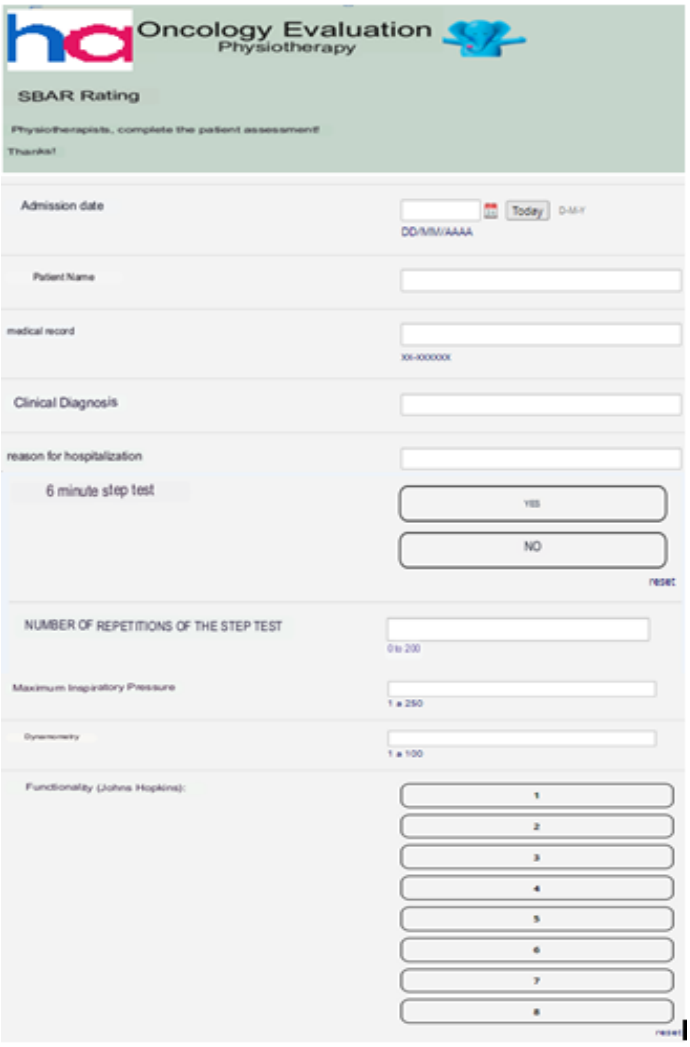
METHOD: Bibliographic review and description of pre and post HSCT evaluation protocol of an adult HSCT inpatient unit.

RESULTS: Physical therapy consists of collecting clinical data from the patient to understand the underlying disease, treatments, procedures and comorbidities, followed by a physical examination with the application of tests and scales, such as: the 6-minute degree test to assess physical capacity and functional, which consists of a self-paced submaximal effort test, climbing a 20 cm step for a period of 6 minutes, with evaluation of training signs and subjective perception of effort through the Borg Scale before and after the test; in order to verify the response to the exercise; manovacuometry to evaluate the maximum inspiratory pressure (MIP), which reflects the strength of the inspiratory muscles; Johns Hopkins highest level of mobility scale, to assess the level of mobility, an important predictor of loss of autonomy and independence; dynamometry to assess handgrip strength, which reflects the individual's global strength; and Fatigue pictogram that quantifies the patient's degree of fatigue, with all the estimates described above performed again at hospital discharge. All estimates were followed as a routine physiotherapeutic assessment at the institution, with data being entered into a Red cap spreadsheet to assess indicators and as a means of comparing the functional alterations of pre- and post-HSCT patients. The choice of tests and scales was made through research in the literature and evaluation scope, encompassing evaluation of peripheral and respiratory strength, level of mobility and physical conditioning.

CONCLUSION: Through the physiotherapeutic evaluation, it is possible to identify patients at risk and intervene early, in order to prevent or minimize possible complications and negative results, as well as to monitor the patient's response to treatment.

Keywords: Maximum inspiratory pressure, Physiotherapy, Six-minute step test

FIGURE 1- Physical therapy evaluation of the oncohematological patient



PROFILE OF PATIENTS WITH MULTIPLE MYELOMA CANDIDATE FOR AUTOLOGOUS HEMATOPOIETIC STEM CELL TRANSPLANTATION EVALUATED BY THE PHYSIOTHERAPY SERVICE AT A PUBLIC HOSPITAL IN PORTO ALEGRE-RS

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Introduction: Hematopoietic stem cell transplantation (HSCT) is a potentially curative treatment for a wide variety of hematological diseases. Since it is a highly complex procedure, specialized and multidisciplinary care is required, so that the result is as satisfactory as possible. Patients undergoing HSCT may have complications that lead to deterioration in functional capacity, as a result of underlying diseases, previous treatments, the HSCT itself, and complications from hospitalization. Therefore, it is necessary to use measures that aim to prevent, minimize or rehabilitate functional complications throughout the treatment process.

Objective: To describe the profile of patients with Multiple Myeloma (MM) eligible for autologous HSCT at a public hospital in Porto Alegre, evaluated by the physiotherapy service before transplantation.

Methodology: This descriptive study presents data from physiotherapeutic assessments pre-autologous HSCT, carried out on an outpatient basis at the hospital. The patients were submitted to the following tests: dynamometer, sit and stand test (30 seconds), Timed Up and Go test and functionality test using the ICU-MS mobility scale. In addition, data were collected from spirometry and the 6-minute walk test, which were performed by the hospital's Pulmonology Service. The performance status assessment (ECOG) was collected from medical records. The data obtained were expressed as means, medians and standard deviations.

Results: 22 patients were evaluated, all diagnosed with Multiple Myeloma, with a mean age of 56.6 years (SD± 10.73) and 63.6% were male. Regarding the reported comorbidities, 63.6% had systemic arterial hypertension (SAH) and 13.63% had type 2 diabetes mellitus (DM2). In the assessment of peripheral muscle strength performed with a Saehan handheld hydraulic dynamometer, a result of 22KgF was found in women and 42KgF in men, with only 1 patient having dominance in the left upper limb. According to the ECOG table, 21 patients had PS of 1 and only 1 patient had PS 2. The spirometry found FEV1/FVC% within normal limits in 18 cases, and those with ventilatory disorders were: mild restrictive (n=2), mild obstructive (n=1) and moderate obstructive (n=1), but all without clinical signs of ventilatory dysfunction. In the 6-minute walk test, 4 patients performed below the predicted, 4 above the predicted and 14 performed within the normal range, and in the 30-second sit-to-stand test, the mean was 12.15 seconds (SD±4.0 seconds). The mobility scale used was the ICU-MS, where all patients (n=22) were classified as independent.

Conclusion: The pre-HSCT physiotherapeutic assessment is of paramount importance for the treatment, bringing tangible data of the individual's physical fitness, aiming at their functional capacity and quality of life before, during and after hospitalization.

Keywords: physiotherapy, autologous transplantation, multiple myeloma.

SIX-MINUTE STEP TEST TO ASSESS THE PHYSICAL CAPACITY OF PATIENTS IN THE HEMATOPOIETIC STEM CELL TRANSPLANTATION SCENARIO

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Introduction: Frequently, during the different phases of hematopoietic stem cell transplantation (HSCT), the patients' physical and functional capacity are compromised. Among the causes, the following stand out: the underlying disease, chemotherapy, infectious complications, malnutrition and prolonged periods of restriction/immobilization in bed. These factors affect the cardiovascular and respiratory systems and cause sarcopenia, leading to progressive decline in physical capacity, exercise intolerance and fatigue. Physical and functional assessment of patients before and after HSCT is of great importance in order to prevent and treat these complications early. The 6-minute step test (6MST) is one of the tools used for this assessment. Its application is simple, does not require large equipment or physical space and is applicable in the HSCT scenario.

Objective: To describe the 6MST institutional protocol of a HSCT Unit.

Method: Bibliographic review and institutional protocol description.

Results: The 6MST is an important health indicator that determines the effectiveness and efficiency of interventions, reflects performance in daily living activities, work, mobility and leisure, and is an easy-to-apply tool in the HSCT scenario. It is a submaximal exercise test, using a 20 cm platform (step), going up and down in self-paced movements. Through the Borg Scale, the vital signs and exertion subjective perception are evaluated before and after the test during 6 minutes, with the purpose of identify the exercise chronotropic response. The total number of ascents is counted as quickly as possible, using incentive phrases standardized by the evaluator. Literature defines the performance classification according to a test prediction equation and the patient's age (within expectations; below or above; according to a test prediction equation; according to the patient's age). The test is contraindicated in patients who have heart and/or lung diseases, orthopedic dysfunction with gait impairment, reduced mobility level, deep venous thrombosis of the lower extremity and cognitive impairment that makes it impossible to understand and collaborate in the assessment. Through this test, it is possible to prescribe a suitable and individualized exercise program, to evaluate and compare the changes related to the HSCT process and implement a more complete rehabilitation program, involving damage prevention related to the patient's physical conditioning and function recovery. The test implementation has helped to direct appropriate exercises prescription, according to individual needs and to the exercise chronotropic response. The target training heart rate is defined for the test.

Conclusion: The 6MST allows identifying the patient at functional decline risk, to intervene early to prevent or minimize complications, and individualize the exercises prescription.

Keywords: 6-minute step test, hematopoietic stem cell transplantation, physical capacity, physiotherapy.

NUTRITION

ASSISTANCE PROTOCOL OF NUTRITIONAL CONDUCT FOR ADULT PATIENTS UNDERGOING AUTOLOGOUS STEM CELLS TRANSPLANTATION AT HOSPITAL NOSSA SENHORA DA CONCEIÇÃO

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Introduction: Autologous Hematopoietic Stem Cell Transplantation (HSCT) is a consolidated therapy in the treatment of several tumors. Nutritional therapy is part of the global treatment that integrates modern cancer treatments, benefiting the patient from the beginning of the treatment, considering the particularities of each stage. In the particular case of HSCT, there are additional challenges that are characterized by a period of low intake due to intensive chemotherapy and mucositis, wich oftem leads to non-standard conducts by multidisciplinary team and caregivers. The patient's nutritional status is one of the factors that influence the prognosis of transplant recipients, length of stay, patient and family distress and clinical endpoints.

Objective: With the objective of qualifying the nutritional therapy of these patients and avoiding compromising their nutritional status, we developed a clinical-assistance protocol of nutritional practices for adult patients to be implemented at a tertiary hospital in the south of Brazil (Hospital Nossa Senhora da Conceição).

Methodology: The protocol was developed based on the adaptation of protocols and clinical guidelines from the last five years on the websites of the main national and international clinical/scientific societies and on the guidelines of the Ministry of Health. The quality of evidence was assessed using the AGREE II tool.

Results: Nutritional conducts related to screening and nutritional assessment, estimates of energy and protein needs, indication of nutritional therapy and need for a diet for neutropenia were established.

Conclusion: The creation, implementation and monitoring of this protocol is essential to promote patient rehabilitation and standardize conducts between multidisciplinary team and caregivers.

Keywords: Clinical Protocols; Clinical Practice Guides; Hematopoietic Stem Cell Transplantation; Bone Marrow Transplantation; Autologous Transplantation; Nutritional Assessment; Nutritional Therapy.

CHARACTERIZATION OF BODY COMPOSITION IN PATIENTS WITH HEMATOLOGIC NEOPLASMS IN PRE ALLOGENIC HEMATOPOIETIC STEM CELL TRANSPLANTATION: A DESCRIPTIVE ANALYSIS

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Introduction: During allogeneic hematopoietic stem cell transplantation (alloHSCT), a reduction in muscle mass decreases survival, increases infection rates, graft delay, and prolongs hospitalization. Excess adipose tissue is associated with a higher risk of mortality and increased incidence of graft-versus-host disease (GVHD). Sarcopenia secondary to neoplasms and their treatment and the phase angle (PA), an important impedance parameter and indicator of cellular health, represent more sensitive predictors in this context. Therefore, assessing these parameters can ensure targeted nutritional interventions and better outcomes in alloHSCT.

Objective: To characterize the body composition of patients diagnosed with hematologic neoplasms prior to alloHSCT.

Methods: Multicenter study, included patients of both sexes, aged between 18 and 60 years in the pre-alloHSCT. Approved by both research ethics committees under the CAAE 93806418.4.0000.5440 and 93806418.4.2001.5437. Weight, calf circumference (CC), handgrip strength (HS), fat-free mass (FFMI) and fat mass (FMI) were measured using bioimpedance spectroscopy (BIS). IBM SPSS® software 27.0 for Windows was used for descriptive analysis and application of the t-test for CC, HS, IFFM, and PA with a significance level of ≤ 0.05.

Results: From May 2022 to May 2023, 27 participants were included, of whom 63% were male and 37% were female, with a mean age of 38 years (SD±10.4) and a prevalent diagnosis of Acute Myeloid Leukemia (37%) (Table 1). The mean weight was 75.8 kg (SD±17.7) and body mass index (BMI) 26.7 kg/m^2 (SD±6.3). The mean CC in both sexes was significantly higher than the reference value, being 35 cm (SD ±3.3) for males and 34.5 cm (SD ±2.8) for females, p=0.024 and p=0.020, respectively. There was a significant difference in HS between the sexes (p=0.000), with a mean value greater than the reference value of 37.8 kg (SD±6.9) in men and 23.8 kg (SD±4.2) in women. The FFMI showed mean values significantly lower than the reference value in males 15.2 kg/m^2 (SD±1.8) and in females 10.6 kg/m^2 (SD±1.9), with p=0.000 in both. The average value of PA when compared to the reference value did not show a significant difference (p=0.412) (Table 2). A total of 3.7% of the participants presented sarcopenia classification, with HS and FFMI reduction; however, 88.9% of the participants presented reduced FFMI and 70.4% increased FMI. Conclusion: The findings of this study show that although patients in the pre-alloHSCT group had an average BMI of overweight, CC and HS above the reference points and PA within the normal range, when body composition was evaluated, it was found that there was a reduction in FFMI and FMI, indicating the need for more targeted assessments for this population, focusing on preserving muscle mass and clinical outcomes.

Keywords: Body composition. Allogeneic hematopoietic stem cell transplantation. Handgrip strength. Sarcopenia. Phase angle. Bioimpedance spectroscopy (BIS).

TABLE 1: Sample characterization

		N	%
Sex	Male	17	63
	Female	10	37
Doença	AML	10	37
	ALL	8	26.6
	HD	2	7.4
	NDL	2	7.4
	CML	1	3.7
	AL	1	3.7
	PM	3	11.1
Sarcopenia	Yes	1	3.7
	No	26	96.3

AML: Acute Myeloid Leukemia; ALL: Acute Lymphoid Leukemia; HD: Hodgkin Disease; NHL: Non-Hodgkin Lymphoma; CML: Chronic Myeloid Leukemia; AL: Acute Leukemia; PM: Primary Myelofibrosis.

TABLE 2: Results of test T

		M(±SD)	Reference value	P value
CC	Male	35(±3.3)	33	0.024
	Female	34.5(±2.8)	32	0.020
HG	Male	37.8(±6.9)	27	0.000
	Female	23.8(±4.2)	16	0.000
FFMI	Male	15.2(±1.8)	17.6	0.000
	Female	10.6(±1.9)	15	0.000
PA		5.8(±0.8)	6	0.412

CC: calf circumference; HG: handgrip strength; FFMI: fat-free mass; PA: phase angle.

GRAFT-VERSUS-HOST DISEASE OF THE SKIN: CHALLENGES FOR THE USE OF PARAMETERS FOR NUTRITIONAL MONITORING

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Introduction: Graft-versus-host disease (GVHD) is the main complication of hematopoietic stem cell transplantation (allo-HSCT), and its treatment leads to a series of disorders, such as prolonged use of corticosteroids and immunosuppressants, and their adverse effects, such as diabetes and liver and kidney disorders. In this context, some bioelectrical impedance (BIA) parameters, such as the phase angle (AF) and fat-free mass (FFM), are important tools for the long-term follow-up of patients diagnosed with skin GVHD. Therefore, evaluating these parameters in this scenario can contribute to monitoring nutritional status more assertively while patients are undergoing clinical treatment.

Objective: To determine the relationship between BIA and functional parameters in patients undergoing treatment for skin graft-versus-host disease (GVHD).

Method: This retrospective observational study analyzed nutritional care data from electronic medical records. Variables from patients of both sexes, aged between 18 and 60 years, were included, including PA, FFM, adductor pollicis muscle fold (PAP), and hand dynamometry (HGS). Statistical analysis was performed using the Chi-square test and Pearson's correlation, with a significance level ≤ 0.05

Results: From January 2019 to May 2023, 93 patients underwent the TCTHalo and approximately 21% (n=20) were diagnosed with GVHD of which 90% (n=18) were male and 10% (n=2) female, with a mean age of 37 years.

The results of the statistical analysis are described in Table 1.

Conclusion: These preliminary data indicate that patients with skin GVHD may have slightly reduced functional measures, such as PAP, which may be related to scleroderma. Some changes in body composition and functionality parameters in patients during the treatment of GVHD, and point to the need to monitor these measures, and earlier nutritional interventions, which can function as indicators of the nutritional status and evolution of treatment in this population

Keywords: Graft-versus-host disease. Phase angle. Fat-free mass. Adductor pollicis muscle fold.

Table 1: Results of Pearson's correlation and chi-square test

		M(±SD)	Reference values	r	P value
APMF(mm)		18 (±4,77)	12	-0,22	0,00
HGS(kg)		34(±11,75)	27	-0,038	0,09
FFM(kg)	44,21 (±15,89)		-	-0,068	0,000
PA(º)	6,35(±1,58)		5,0	-0,44	-

HGS: handgrip strength PA: phase angle; FFM (fat free mass);APMF: adductor pollicis muscle fold; M= mean; r=pearson correlation

NUTRITIONAL PROFILE OF PATIENTS WITH MULTIPLE MYELOMA SUBMITTED TO HEMATOPOIETIC STEM CELL TRANSPLANTATION IN A PUBLIC HOSPITAL IN PORTO ALEGRE - RS

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Introduction: Hematopoietic stem cell transplantation (HSCT) have an important role in Multiple Myeloma treatment with an important progression-free survival gain. It is a highly complex procedure, the success of which directly involves the performance of a specialized multidisciplinary team. From a nutritional point of view, patients with Multiple Myeloma (MM) are treated with corticoesteroids in high dosis for long periods (which can cause weight gain and loss of muscle mass), are relatively older and have a higher metabolic demand and complications that affect their nutritional status.

Objective: To describe the nutritional profile at admission to autologous HSCT Hospital Nossa Senhora da Conceição in Porto Alegre, Rio Grande do Sul/Brazil.

Methodology: Descriptive study that presents the nutritional data of all the first patients (adults and elderly) submitted to autologous HSCT, evaluated according to the institutional protocol used at the hospital's hematology unit. Nutritional status was determined using measurements of arm circumference (AC - in centimeters - Frisancho, 1990), calf circumference for the elderly (CC - in centimeters - BARBOSA-SILVA et al.; 2016), by the Patient-Generated Subjective Global Nutritional Assessment (PG-SGA - GONZALEZ et al., 2010) and Body Mass Index (BMI - kg/m2 - WHO, 2000 and OPAS, 2002 for the elderly). Data were expressed as means and proportions. Symptoms that reduced food intake, presence of previous comorbidities and the use of nutritional therapy were collected from the medical record.

Results: We evaluated 22 patients, with a mean age of 56.6 ± 10.7 years. All patients had a diagnosis of Multiple Myeloma and 63.6% were male. Regarding the reported comorbidities, 63.6% had hypertension and 13.6% DM2. According to the PG-SGA, 91% of the patients were well nourished and 32% had mild malnutrition, according to the AC. Among the elderly, 87.5% had adequate reserve of muscle mass according to CC. Regarding BMI, 100% of adults were overweight and/or obese, and among the elderly, 50% were overweight and/or obese. All patients had a lack of appetite during hospitalization and the other symptoms reported were: nausea/vomiting (91%), mucositis (77%) and diarrhea (73%). During hospitalization, 77% of patients received oral nutritional therapy. Enteral and parenteral nutritional therapy were not used. The average length of hospital stay was 18 ± 4.41 days and the percentage of weight loss in this period was 5.3% on average. The median time from diagnosis to transplant was 10 months.

Conclusion: a high overweight/obesity incidence highlight the importance of the nutritionist in all stages of the treatment of these patients, aiming not only the adequate management of symptoms related to HSCT but also maintaining the nutritional status in the pre and post-transplant periods.

Keywords: Hematopoietic Stem Cell Transplantation; Bone marrow transplant; Nutritional Assessment; Nutritional Therapy.

ODONTOLOGY

FACIAL CELLULITIS IN UPPER LIP AFTER LOCAL TRAUMA- CASE REPORT

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Introduction: Acute myeloid leukemia (AML) is the most common leukemia in the elderly. Its treatment is challenging, and often Hematopoietic Stem Cell Transplantation (HSCT) is the only curative modality. Modifications in the oral mucosa are frequently associated with chemotherapy. Management of adverse oral effects in onco-hematological patients is essential to alleviate symptoms, reduce the chance of complications and the risk of death. Objective: to describe the case of a patient undergoing treatment for AML who had cellulite on the upper lip due to facial trauma.

Method: case report.

Results: male, 70 years old, AML being treated with azacytidine and venetoclax, referred face trauma caused by his pet (dog), with painful symptoms, increased volume, redness and febrile episode. Clinically, the presence of edema and voluminous erythema was observed on the left cheek, with an ulcerated lesion on the upper labial mucosa. The patient was under outpatient follow-up 10 days after the last chemotherapy cycle. After multidisciplinary discussion with the medical team, hospitalization was chosen due to the condition. The treatment carried out at hospital environment was the change of antimicrobial medication (to piperacillin-tazobactam), maintaining the use of local topical antiseptic, associated with the application of daily Low Intensity Laser Therapy until complete healing of the lesion.

Discussion: Trauma to the oral mucosa caused by the action of mechanical agents is the most common predisposing factor for ulcerated lesions in the oral cavity. Due to their immunosuppression, compromised mucosal barriers and changes in the oral microflora resulting from antineoplastic therapy, the clinical status of onco-hematological patients is frequently aggravated by infections. Facial cellulitis is a severe infection of acute nature, with rapid progression (2 to 4 days), diffuse location, absence of purulent secretion, and, in some cases, hardened consistency. It is usually caused by polybacterial flora. The treatment of traumatic ulcers consists of removing the causative agent and keeping the wound clean, associated with the use of analgesic medication, antiseptics and topical corticosteroids. The associated application of Low Intensity Laser Therapy offers advantages, enhancing the closure and healing of the lesion, collaborating with the favorable evolution of the condition. Other secondary factors should also be evaluated, such as nutritional status, changes in salivary production, local trauma and level of oral hygiene, before and during cancer therapy. Conclusion: Immunosuppression after chemotherapy treatment is expected, but the individual response is variable. Oral trauma that progresses to cellulitis in this population is a potentially serious complication, therefore odontological follow-up becomes essential for the diagnosis and adequate multidisciplinary management of the patient.

ORAL CHRONIC GRAFT-VERSUS-HOST DISEASE IN A PEDIATRIC PATIENT: A CASE REPORT

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Introduction: Chronic graft-versus-host disease (cGVHD) is a frequent complication after allogeneic hematopoietic stem cell transplantation (HSCT) in which donor's functional T lymphocytes recognize as non-self the recipient's cells triggering inflammatory responses reaching tissue damage including the oral mucosa and salivary glands. The clinical manifestation of oral cGVHD involves any region of the mouth: lips, lip and jugal mucous membranes, tongue, hard and soft palate, floor of the mouth, gums, as well as salivary function and restriction of oral movement. Among the therapeutic pharmacological measures, the use of corticosteroids is the gold standard of treatment of affected patients. Objective: To report the case of a pediatric patient who presented chronic GVHD in the oral cavity after hematopoietic stem cell transplantation (HSCT).

Case report: a 16 years-old male patient with Acute Lymphoid Leukemia submitted to related allogeneic HSCT in February 2023, with myeloablative conditioning regimen (Etoposide and TBI1,200cGy). He presented grade IV oral Mucositis in the presence of the submitted conditioning. After graft recovering and Upon hospital discharged, the patient still had some ulcerations in the oral cavity in the process of regression. Although, on D+ 54, there was the appearance of new lesions on the back of the tongue, in addition to hypersalivation. In dental evaluation, it was decided to perform the biopsy, in which the infectious causes were excluded. In this sample, rare apoptosis was evidenced, and it was not possible to exclude the possibility of GVHD. The patient had been using systemic corticosteroids for the treatment of acute skin GVHD, however, as it evolved with worsening of the condition (complaint of pain in the floor region, lateral edges of the tongue, bilateral jugal mucous membranes), it was decided to associate topical corticosteroids to the treatment. In a medical and dental reassessment in May 2023, there was a consensus to continue weaning from systemic corticosteroids, due to comorbidities presented by the patient (osteonecrosis of the femoral head), opting for the maintenance of topical corticosteroids and the patient evolved with good control of oral cGVHD. Currently, the patient is still under dental follow-up, with gradual improvement of the condition.

Conclusion: Due to The high complexity of The physiopathplogy of cGVHD, it is well-know that dentist in the HSCT team needs to be trained to identify possible oral changes that may arise as a result of HSCT complications, thus contributing to the diagnosis, management and promoting quality of life, especially in those patients with GVHD.

Keywords: Pediatric dentistry. hematopoietic stem cell transplantation. Graft-versus-host disease.

ORAL MANIFESTATIONS OF CHRONIC GRAFT VERSUS HOST DISEASE: A DIAGNOSTIC CHALLENGE

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Introduction: The involvement of the oral cavity by chronic graft-versus-host disease (cGVHD) is frequent. Among the most common manifestations are lichenoid striations. However, whitish plaque lesions may be present and are a challenge for diagnosis and follow-up, since they are the most commonly associated with dysplastic changes and the development of squamous cell carcinoma.

Objective: The objective of this case is to describe 9 years of follow-up of cGVHD in the oral cavity with white plaque-like manifestation.

Clinical case: 54-year-old male patient, 10 years after allo-HSCT, HLA identical due to mantle lymphoma. His sister was the donor and source of cells, peripheral blood. He underwent conditioning with fludarabine and busulfan and prophylaxis for GVHD with methotrexate and cyclosporine. The patient was diagnosed with severe global chronic GVHD with skin, liver and mouth involvement in the first year after transplantation. The lesions in the mouth appear as non-scratchable white plaques, with a rough surface, present on the left buccal mucosa, lower labial mucosa, left retromolar triangle and hard palate region. There were episodes of pain, burning to feed and trauma due to biting. Incisional biopsies were performed annually for clinical follow-up. The anatomopathological exams indicated: prominent epithelium, of the orthokeratosis type, findings compatible with cGVHD, mild leukoplakia, but absence of malignancy. With the intention of controlling the symptoms and trauma to the mucous membranes, the treatments prescribed included clobetasol propionate mouthwash, corticoid ointment with an antifungal agent, and installation of acetate plates to reduce friction on the mucous membranes. A multidisciplinary team is still following up with the patient.

Conclusion: This clinical case highlights the importance of a multidisciplinary team in the management of cGVHD oral lesions, especially in the diagnosis and treatment of lesions at risk of becoming malignant.

Keywords: Chronic graft-versus-host disease. Oral lesions. Allogeneic hematopoietic stem cell transplantation.

ORAL SQUAMOUS CELL CARCINOMA IN PATIENTS WITH FANCONI ANEMIA: A REPORT OF TWO CASES

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Introduction: Fanconi Anemia (FA) is a rare disease with an incidence of 1 to 5 per million births. Patients diagnosed with FA have progressive congenital and hematological anomalies and require hematopoietic stem cell transplantation (HSCT). Compared with the general population, these patients have a risk of up to 700 times greater of developing squamous cell carcinoma (SCC) of the head and neck, including oral cancer. Although curative in relation to bone marrow failure, performing HSCT increases the risk of SCC by 4.4 times.

Objective: To report the cases of patients diagnosed with FA who developed oral SCC.

Case Reports: Two male patients with oral SCC were included in the sample; one patient had undergone HSCT while the other had not been transplanted. Although common in individuals diagnosed with FA, neither patient presented other oral lesions when they developed ulcerations with a clinical appearance consistent with malignancy. The first patient was a 32-year-old male who had undergone HSCT 24 years prior. He manifested an ulcerated lesion with leukoerythroplastic areas that was painless in the right buccal mucosa. The second patient was a 21-year-old male who had not yet undergone HSCT. He presented an ulcerated lesion with a verrucous aspect and leucoplastic areas that caused discomfort and bled on touch in the region of the floor of the mouth and gingival edge of the lower anterior teeth on the left side, close to the midline. In both cases, an incisional biopsy was performed for diagnostic confirmation and therapeutic planning. Additionally, at the time of evaluation, a cell smear was collected from the lesions as well as from the buccal and lingual border mucous membranes to perform conventional exfoliative cytology and a micronucleus frequency test to verify cytological changes and demonstrate chromosomal instability in the cells. A higher relative frequency of micronuclei was identified in malignant neoplasms when compared to intact mucous membranes, demonstrating the chromosomal instability of the evaluated cells.

Conclusion: Although HSCT increases the risk of oral SCC, this risk already exists in patients with FA. Therefore, oral malignant neoplasms can be identified in young patients whether they have been transplanted or not. Routine screening and monitoring of this group of patients is necessary to enable early diagnosis and increase survival rates.

Keywords: Oral cancer. Fanconi anemia. Bone marrow transplant. Micronucleus test.

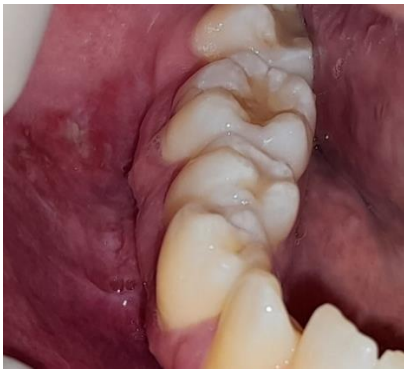

FIGURE 1: Squamous cell carcinoma in the right buccal mucosa in a patient had undergone HSCT.

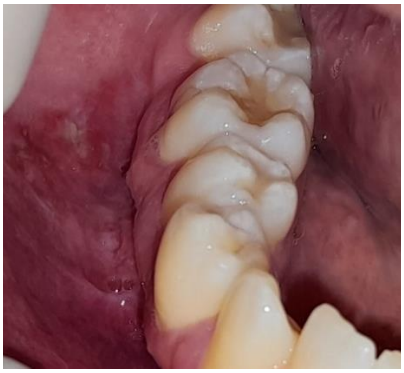

FIGURE 2: Squamous cell carcinoma in the region of the floor of the mouth and gingival edge of the lower anterior teeth on the left side, in a patient not yet undergone HSCT.

PYOGENIC GRANULOMA IN A PEDIATRIC PATIENT AFTER ALLOGENEIC TRANSPLANTATION AND WITH GRAFT VERSUS HOST DISEASE: CASE REPORT

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Introduction: Approximately 80% of patients after allogeneic hematopoietic stem cell transplantation (allo-HSCT) have oral manifestations of chronic graft-versus-host disease (cGVHD). The most frequent are lichenoid lesions, ulcers and erythema. On the other hand, the association of benign proliferative lesions, such as pyogenic granuloma, with oral cGVHD is rare.

Objective: This clinical case aims to report the diagnosis and treatment of pyogenic granuloma secondary to oral cGVHD in a pediatric patient after allo-HSCT.

Clinical case: A 5-year-old male patient underwent the second haploidentical allo-HSCT for severe aplastic anemia. His sister was the donor and source of cells, peripheral blood. He performed conditioning with fludarabine, cyclophosphamide and TBI and GVHD prophylaxis with ATG. After 6 months, the patient was diagnosed with acute skin GVHD and started using prednisolone 1mg/kg/day. Around D+270, the patient had ulcerative lesions on the bilateral buccal mucosa and lateral borders of the tongue that evolved into ulcerated nodular lesions accompanied by pain. Clobetasol propionate 0.05% oral solution was prescribed, but without success. The patient had a significant complaint of pain and lack of appetite due to the nodular lesions, therefore, surgical excision and the use of acetate plates in the upper and lower arches were indicated to reduce trauma to the oral mucosa. The anatomopathological examination showed extensive erosion of the epithelium associated with a mixed inflammatory process, fibrin-leukocyte crust and capillary proliferation, favoring the diagnosis of pyogenic granuloma. The patient presented the onset of recurrence in the right buccal mucosa 7 days after excision of the lesion. The use of 0.1% clobetasol propionate ointment associated with acetate plates was prescribed, which allowed regression of the lesion.

Conclusion: This clinical case points to the importance of the presence of a multidisciplinary team for the diagnosis of atypical oral lesions in cGVHD, especially in pediatric patients.

Keywords: Pyogenic granuloma. Graft versus host disease. Pediatrics. Allogeneic stem cell transplantation.

PSYCHOLOGY

DISTRESS LEVELS IN MULTIPLE MYELOMA PATIENTS UNDERGOING AUTOLOGOUS HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Distress is an unpleasant experience of biopsychosocial and spiritual nature that can affect the way the individual feels or acts, being a common symptom among cancer patients. Distress ranges from mild to extreme levels and can be altered by the type of diagnosis, as well as by therapeutic treatment options. In this context, both Multiple Myeloma, as a malignant and incurable disease, and autologous hematopoietic stem cell transplantation (HSCT), as a complex procedure that entails risks for the person, can increase the levels of distress.

Objective: To assess the level of distress in patients with multiple myeloma before autologous HSCT.

Casuistry: Patients diagnosed with Multiple Myeloma who underwent autologous HSCT at a tertiary hospital in Porto Alegre/RS in the years 2022 and 2023.

Methodology: Observational, retrospective and prospective, longitudinal study, approved by the research ethics committee (opinion number 5.986.223). The instrument chosen to assess the distress of patients undergoing autologous HSCT was the Distress Thermometer, consisting on a scale that assesses the level of distress, from 0 (no distress) to 10 (extreme distress), in addition to a List of Problems consisting of 35 items, subdivided into 4 groups: practical, family, emotional and physical problems. A score equal to or above four indicates a significant level of distress and a score below four indicates mild distress. Descriptive statistics procedures (frequency and percentage) were used for instrument analysis.

Results: So far, 20 patients have been evaluated, being 12 (60%) male and 8 (40%) female, predominantly in the age group of 61 to 72 years old (45%). Of these, 8 (40%) had mild distress and 12 (60%) had a significant level of distress. The most recurrent items marked on the list of problems were: nervousness (n=14; 70%), fear (n=6; 30%) and concern (n=13; 65%), in the emotional problems subgroup; pain (n=11; 55%), sleeping (n=7; 35%), fatigue (n=7; 35%) and tingling hands/feet (n=10; 50%) in physical problems. Financial planning/health and work, which are part of the practical problems subgroup, were marked 4 times each (20%).

Conclusion: When undergoing an invasive procedure such as HSCT, the patient may experience a significant level of distress, as well as multifactorial changes as a result of the treatment or the disease. Thus, it is important to have a psychology professional on the team to investigate the level of distress in oncohematologic patients undergoing HSCT in order to prevent, intervene or/and minimize emotional distress, thus ensuring greater well-being for the patient.

Keywords: Autologous hematopoietic stem cell transplantation; distress; multiple myeloma.

MAJOR DEPRESSIVE DISORDER IN PATIENTS SUBMITTED TO HEMATOPOETIC STEM CELL TRANSPLANTATION AND THEIR FAMILIES: INTEGRATIVE REVIEW

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Introduction: Major Depressive Disorder (MDD) can be characterized by the presence of depressed mood, decreased interest in pleasurable activities, feelings of guilt, fatigue, and changes in weight, sleep, psychomotor and cognitive aspects. MDD can be caused by genetic, psychological and environmental factors. Scientific studies have shown the prevalence of MDD in cancer patients, especially in the most advanced phase of treatment.

Objective: To identify, through an Integrative Review, the prevalence of MDD in patients who underwent Hematopoietic Stem Cell Transplantation (HSCT) and their families.

Method: This study is an Integrative Review, a method that allows the identification and analysis of scientific articles in order to direct clinical practice. To this end, the descriptors "Major Depressive Disorder" and "Hematopoietic Stem Cell Transplantation" were validated on the Descriptors in Health Science and Medical Subject Headings platforms; and with this, the search strategy was built, which was inserted into five databases. The articles found were selected based on exclusion criteria (incomplete articles and/or unavailable for access and duplicate articles) and inclusion (publications in English or Portuguese and publications that correlated with the scope of the work). To select the articles, the titles were read and analyzed, the abstracts were read and analyzed, and the full article was read and analyzed.

Results: After inserting the keywords in the databases, 127 articles were found. However, after applying the exclusion criteria, only 34 articles remained in the study. The title of all selected articles was read and analyzed based on the criteria and inclusion; and after that, 18 articles were selected for reading the abstracts. After reading the abstract, four studies were selected for full reading. The analysis of these articles showed that many scientific studies have been dedicated to evaluating the psychological and psychiatric symptoms of caregivers.

Conclusion: It is noted that depression and other psychiatric symptoms are present in patients and caregivers who underwent HSCT, therefore, research is suggested that aim to evaluate interventions for such demands.

Keywords: Major Depressive Disorder. Hemapoetic Stem Cell Transplantation. Bone marrow transplant. Psychology. Prevalence.

TABLE 1. Selected articles

Year	Title	Purpose	Method	Conclusion
2023	Symptom Clusters in Family Caregivers of Hematopoietic Stem Cell Transplantation Recipients: loneliness as a Risk Factor	Analysis the prevalence the symptoms cognitive and emotional in caregivers of recipientes HSCT.	Experimental study; randomized.	Caregives have sympoms cognitive and emotional, like depression, anxiety, fatigue, sleep distubance and cognite impaiment; and caregives with loneliness apresentati more syntoms intense.
2017	Effect of parental depression level on children's quality of life after haematopoietic stem cell transplantation	To acess the impact of parental depression level on children's quality of life after HSCT.	Descriptive cross-sectional study	The depression parents affects children's quality of life after HSCT.
2014	Psychological distress and psychiatric diagnoses among primary caregivers of children undergoing hematopoietic stem cell transplant: an examination of prevalence, correlates, and racial/ethnic differences	Examine the prevalence of self-reported psychological distress among primary caregivers of children preparing to undergo HSCT.	Experimental study; randomized clinical trial.	Parents apresentacion more Posttraumatic stress symptoms than depression or ansiety.
2013	Impact of psychological screening on routine outpatient care of hematopoietic cell transplantation survivors	To evaluate whether the "Health Questionnaire (PHQ)" helps in the assessment of depression, anxiety and substance use.	Experimental cross-sectional study	Patients in the experimental group (evaluted by PHQ) discussion more of psychological symptoms.

PSYCHOLOGICAL EVALUATION BEFORE HEMATOPOIETIC STEM CELL TRANSPLANTATION IN A REFERENCE INSTITUTION IN THE INTERIOR OF SÃO PAULO

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Introduction: The hematopoietic stem cell transplantation (HSCT) has been a therapy aimed at treating neoplastic and benign diseases by infusing stem cells from the recipient himself or from a donor. Before, during, and after HSCT, psycho-emotional demands related to the treatment arise, which can interfere with and impair the patient's experience and coping. The pre-HSCT psychological assessment aims to identify factors related to the patient's history, support network, family support and understanding of the proposed disease and treatment; factors that may interfere with coping.

Objective: To describe the psychological assessment protocol carried out with HSCT candidate patients in a reference center in the countryside of São Paulo. Method: Literature review and description of pre HSCT psychological evaluation protocol from an adult HSCT inpatient unit.

Results: The pre HSCT psychological evaluation protocol established in the institution counts initially on a psychological interview, which seeks to identify psychosocial factors related to the patient's clinical and life history, as well as data about the psychophysiological functions, mental state examination, understanding and coping. Quality of life indices are evaluated through the Functional Assessment of Cancer Therapy - Bone Marrow Transplantation (FACT-BMT) scale, an instrument that seeks to identify scores related to the domains of physical well-being, social/family well-being, relationship with the physician, emotional well-being, functional well-being, and additional concerns. Data about psychological risk are verified through the application of the Indicator of Psychological Risk in Oncology (IRPO), that an instrument that seeks to identify greater psychological vulnerability and poor adaptation to the treatment proposal and/or the treatment itself, through domains related to the perception of the disease, emotional and instrumental social support, active coping, and distress, thus classifying a general risk index. After the interview, application of the scales, and feedback of results to the patient, the candidate's suitability to undergo the proposed treatment is verified from the psychological point of view. With the institution of the new pre-HCT psychological evaluation protocol, it is expected that the data obtained can contribute to the survey of indicators and as a way to compare the quality of life of patients pre and post HSCT.

Conclusion: Through the pre HSCT psychological evaluation it is possible to identify psycho-emotional factors in the patient that may interfere in the treatment and transplantation, besides distress indexes and data on the patient's quality of life pre and post HSCT, favoring early management of emotional and minimizing the impacts of demands that may arise during hospitalization. With this evaluation, seek to verify the impacts of transplantation and prolonged hospitalization on patients after hospital discharge.

Keywords: Hematopoietic stem cell transplantation. Psychology. Psychological Evaluation.

PSYCHOLOGICAL SUPPORT TO PEDIATRIC PATIENTS SUBMITTED TO HEMATOPOETIC STEM CELL TRANSPLANTATION AND THEIR FAMILIES: INTEGRATIVE REVIEW

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Introduction: Illness and some treatment modalities, such as Hematopoietic Stem Cell Transplantation (HSCT), can cause important emotional demands on patients and their families, such as sadness and anxiety. In this way, psychological follow-up is necessary, since it is psychology and science that intervene under such demands.

Objective: To identify the possibilities for psychologists to work in the pediatric HSCT sector.

Method: This study is an Integrative Review and, therefore, the descriptors - Protocol, Psychology, Pediatrics, Parents and Bone Marrow Transplantation - were validated on the platforms "Health Science Descriptors" (DeCs) and "Medical Subject Headings" (MESH). Then, a search strategy was constructed using the Boolean operators “OR” and “AND”. The selected databases were Medline (Pubmed), Cochrane Library and Virtual Health Library. The eligibility criteria were described through the categories: “Exclusion Criteria” (duplicate works and works that were not scientific articles) and “Inclusion Criteria” (patients diagnosed and treated before the age of 18, patients candidates for HSCT, and articles on psychological performance).

Results: After inserting the search strategy in the databases, 22 articles were found. All articles were analyzed based on eligibility criteria and seven studies were selected to compose this work. Of the selected studies, six had parents or caregivers of children who underwent HSCT as participants and one (1) had as participants patients who underwent HSCT and their families. Of the seven articles, one used a bibliographic review as methodology and the others were empirical research, observational or experimental. All articles report that parents, caregivers or patients undergoing HSCT have important emotional demands and have benefited from psychological support, which took place in the different phases of treatment.

Conclusion: It is concluded that the psychologist can act both in the pre-transplantation phase, as well as intra and post-transplantation. It is expected that this study will help the practices of hospital psychologists.

Keywords: Psychology. Psychological Intervention. Hematopoietic Stem Cell Transplantation.

SOCIAL SERVICE

HOME VISITS AND HEALTH EDUCATION IN ALLOGENIC HEMATOPOETIC STEM CELL TRANSPLANTATION

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Introduction: The home visit as a direct technical-operative instrument is carried out by nurses and social workers, enabling the team to learn about risk factors in the home environment that may jeopardize the recovery of patients undergoing Allogeneic Hematopoietic Stem Cell Transplantation (HSCT). The immunosuppression condition arising from HSCT which can result in the acquisition of opportunistic infections. Because of that it requires the planning of educational health actions that include care for the patient's home in order to reduce exposure to factors that result in fungal and bacterial infections after hospital discharge, and therefore avoiding future readmissions and serious complications.

Objective: o describe the health education process provided through home visits carried out in the pre-HSCT evaluation period.

Methodology: it is an experience report on the work process developed by nurses and social workers in the pre-HSCT period at a reference hospital for transplantation in southern Brazil.

Results: Candidates for HSCT undergo interviews with a multidisciplinary team at the Pre-Transplantation outpatient clinic, in which the patient's biopsychosocial conditions are identified for the planning of intervention proposals and health education appropriate to the presented needs. Among the aspects addressed, the housing condition and the characteristics of the territory acquire important relevance. It is observed that the visits to the place where the patients live make it possible to identify potential risk factors for the acquisition of infections caused by exposure to cement, mold, humidity, excessive dust, lack of sanitation and the presence of transmission vectors. It also allows the understanding of the family support routines and organization of care, as well as characteristics of the territory that make access to treatment unfeasible, such as areas of urban violence, precarious infrastructure and mobility difficulties. The discovery of such aspects allows the development of health education processes considering the universality-particularity-uniqueness of situations that refer to the educational, cultural, socioeconomic context, among others.

Conclusion: transplantation of hematopoietic stem cells within the scope of the Unified Health System (SUS) requires teams to think on the impacts of social inequality, lack of effective public policies and psychosocial burden on families. The housing context identified in home visits exposes the need and the challenge of developing actions that can be adapted and are achievable to the social reality of patients, aiming at safety and adherence to treatment in the best possible way.

Descriptors: bone marrow transplantation, health education, home visit

THE IMPORTANCE OF THE SOCIAL WORKER'S ROLE IN THE SOCIAL DISCHARGE OF POST HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: The health effects caused by the complexity and aggressiveness of a Hematopoietic Stem Cell Transplantation along with the emotional, physical, social, and economic stress which affects not only the user, but also the family nucleus, represent challenges in the transition period from hospital environment to home. In this way, the following paper reports on the acts of social workers, student residents and social service interns at a Bone Marrow Transplant Center at a teaching hospital of the Brazilian Unified Health System (SUS). The social work's role in the health care field is established in the sense of understanding how the social issue affects the particularity of the patient's life, and also the condition as an user of public health care services and the social care network of the patient in facing his or her health-disease process.

Objective: To explain the importance of the Social Work's role in the social discharge process for post hematopoietic stem cell transplantation from a multidisciplinary perspective.

Method: The methodology used was an experience report of the activities developed by social workers professionals in their daily routine in a hematopoietic stem cell transplantation center at a teaching hospital.

Results: The social worker acts to guarantee social rights, articulating the technical-operational dimension through the profession's ethical-political project. Its teleological dimension of work demands from the professional a critical analysis about each patient' specifity, as well as the socio-family situation. It seeks to understand and analyze social security issues, housing, education, culture, and leisure in the universe of each social representation marked in the particular life of the subject assisted. With these analysis perspectives the plan of care and follow-up of the patient is organized until his or her social discharge, articulating strategies in the execution of actions with the multidisciplinary team along with the network in the territory that this subject occupies. To this end, the technical operative dimension is established through household visits. Thus occurring, it will be clear what actions will be undertaken in order that the minimum conditions of comfort and adequacy to sanitary and housing norms are bought so that social discharge becomes singularly effective with clinical discharge, and care is extended through out-of-hospital care.

Conclusions: Thus one can conclude that in this patient's health-disease process, the social worker's specific knowledge and performance is essential to assess social discharge, developing strategies to ensure social rights, inclusion in the care network services, since the social issue focuses on the reality and possible demands presented by the patient.

Keywords: Patient Discharge; Social Services; Hematopoietic Stem Cell Transplantation.

OCCUPATIONAL THERAPY

CONTRIBUTION OF OCCUPATIONAL THERAPY IN THE HUMANIZED PROCESS OF HEMATOPOIETIC STEM CELL TRANSPLANTATION: AN EXPERIENCE REPORT IN A UNIVERSITY HOSPITAL IN SOUTHERN BRAZIL

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Introduction: The high complexity of the hematopoietic stem cell transplantation (HSCT) treatment involves the subject in a series of steps to carry out the treatment, didactically called pre-HSCT, HSCT itself and Post-HSCT. Thus, the period of hospitalization and the characteristics of this process lead to the rupture of the subject's occupational life, limiting them to the experiences of the hospital context. The occupational therapist is a professional with expertise to minimize occupational barriers in HSCT, with actions that allow balance in the person-environment-occupation interaction, and intervene directly to improve the quality of life related to health

Objective: The study aims to describe the actions of humanization adopted by the Occupational Therapy team of a university hospital in southern Brazil.

Method: This is an experience report designed through a descriptive-qualitative analysis of the humanization actions undertaken by the Occupational Therapy team.

Results: Through the application of activities, guidance and training that accommodate the demands, complaints, limitations and potential of the patient, the occupational therapist facilitates the positive relationship between person-environment, through meaningful activities. The service's occupational therapists act in accordance with the National Humanization Policy (PNH), guided by the pillars of welcoming, ambience and expanded and shared clinic. As strategies to implement them, the following protocols are carried out: Welcome, Great Day and Feast of the Pega that temporally and symbolically demarcate important stages of the HSCT process and give new meaning to it. The Affective Record allows the team to know the patient's personal characteristics and preferences, aiming at the ambience and personalization of care. Throughout the therapeutic process, active and qualified listening, enrichment of the hospital routine, meaningful activities and incentives for the empowerment and protagonism of patients and companions are also carried out. These actions consider habits, culture, symbols, beliefs and the subject's occupational repertoire, in order to profitably intertwine the person's characteristics with the care context and clinical demands.

Conclusions: The adoption of humanization protocols, by favoring the subject's singularity to permeate the hospital context, enhances adherence to treatment, since it allows the non-pharmacological management of adverse effects and provides linkage to activities and roles that are not limited to the hospitalization experience. For further studies, the investigation of patients' perception of humanization actions and their influence on the experience of hospitalization for HSCT can be analyzed, in order to better understand their impact.

Keywords: Humanization of Assistance; Occupational Therapy; Bone Marrow Transplantation.

DEVELOPMENT OF GAME AS AN OCCUPATIONAL THERAPEUTIC RESOURCE FOR HEALTH EDUCATION IN PEDIATRIC HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Hematopoietic Stem Cell Transplantation (HSCT) is a highly complex treatment that involves invasive and aggressive procedures and requires a long hospitalization period. For children and adolescents, the anticipation of undergoing HSCT can generate anxiety, doubts, and fear, especially because they may not fully understand the process. In this regard, it is necessary to adopt appropriate health education strategies that align with their typical comprehension abilities during this developmental stage. These strategies aim to provide a sense of predictability while empowering and encouraging the child to take an active role in their treatment. From this perspective, games serve as a powerful tool for learning, as they stimulate individuals and allow for the construction of ideas, actions, and concepts within an imaginary world.

Objective: To describe the development process of a game for providing guidance on the HSCT process, aimed at children and adolescents who will undergo the procedure.

Methods: This is methodological research, typically divided into the following stages: development, validation, and evaluation. This study focuses on the development stage of the game, which was based on a literature review and an informative graphical scheme previously created and used by professionals at the institution, containing the important stages of HSCT. Considering the importance of interdisciplinary collaboration, the project was carried out in partnership with the Design Department of a renowned university.

Results: To develop the game, visual representation and playful narrative were considered as the main elements to facilitate understanding of the HSCT process. The decision was made to present the resource as a cooperative board game, where all players have a common objective and collaboration is encouraged instead of competitiveness. The game consists of characters, actions, events, progressions, threats, and rewards related to the stages of HSCT and the routine adopted in the ward where it was developed. In its creation, low-cost materials that can be easily disinfected according to the biosafety standards established by the institution were considered. The aim was to present the scenario in a playful and accessible way, introducing children and adolescents to the environment they will encounter and the expected events during the HSCT process, in order to facilitate their understanding and coping abilities during hospitalization.

Conclusion: The game will still undergo the validation process by expert professionals and later be evaluated with the children. However, it is believed that the game allows for the adaptation of the professional approach to the child's understanding capacity, making it a resource for health education that contributes to their empowerment and active participation in the HSCT process.

Keywords: Hematopoietic Stem Cell Transplantation; Occupational Therapy; Hospitalized Child; Health Education; Play and Playthings.

PLAYFUL RESOURCE FOR COPING WITH ALOPECIA AND SCALP TRICHOTOMY: EXPERIENCE REPORT FROM THE PERSPECTIVE OF OCCUPATIONAL THERAPY

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Introduction: Children undergoing Hematopoietic Stem Cell Transplantation (HSCT) undergo invasive procedures such as chemotherapy and radiotherapy, which cause significant physical changes. One of the common consequences of this process is alopecia and scalp trichotomy, both frequently seen between days +6 and +14 of the post-transplant period. Such experiences can cause intense suffering and even loss or confusion of identity, especially in female children, as routinely observed by occupational therapy interns in a reference hospital in southern Brazil. Playful strategies can help children understand and cope with such adverse events.

Objective: To report the benefits of using a low-cost graphic and playful/symbolic resource in the recovery of identity and occupational performance in children who have undergone alopecia and/or scalp trichotomy.

Method: This is a report of an experience developed by occupational therapy interns in a Pediatric Bone Marrow Transplant Service.

Results: The occupational therapy assessment carried out throughout the HSCT process is procedural in nature, requiring routine evaluation of the demands. Thus, the interns identified similar demands associated with a significant milestone in the HSCT process: alopecia and trichotomy. Emotional changes such as fear and anxiety were observed, as well as reduced interest in participating in meaningful activities, fragility in identity and self-perception, mood changes, and episodes of inactivity and apathy. These factors directly impact the performance of essential activities in the context, such as health management. Therefore, the occupational therapeutic reasoning was built based on the child's interests, performance skills, presented demands, and context particularities. The resource was created by the interns using low-cost and easily sanitized materials, consisting of symbolic items: a base in the shape of a child's body, hair with different lengths, and head accessories. When using the resource, the children showed enthusiasm in exploring the material and responded satisfactorily to the proposal, with the main result being a concrete observation regarding their self-perception.

Conclusion: Through the resource, it was possible to promote different playful strategies with the potential to intervene in two specific domains: the promotion and maintenance of emotional health and the management of the condition and emotional symptoms, considering predictability techniques. The use of this resource promoted the recovery of the identity of vulnerable children and minimized occupational impacts.

Keywords: Occupational Therapy. Hematopoietic Stem Cell Transplantation. Alopecia. Hospitalized Child. Humanization. Play and Playthings.

PLAYFULNESS AS A HUMANIZATION INSTRUMENT IN MULTIPROFESSIONAL CARE IN A CHILDHOOD AND YOUTH HEMATOPOIETIC STEM CELL TRANSPLANTATION UNIT

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Introduction: Faced with the complexity of hematopoietic stem cell transplantation (HSCT), children and adolescents who undergo it experience several changes and ruptures in their relationships and in their daily lives. The humanization process is of paramount importance in care and becomes even more effective with the monitoring of a multidisciplinary team and the inclusion of playful activities in care. The use of recreational activities in the hospital environment acts as catalysts in the recovery and adaptation process, minimizing the impacts of hospitalization, making the hospital environment more humane and thus favoring their quality of life.

Objective: To describe the actions of the multidisciplinary team to offer humanized care, through the use of playful activities, in a child-juvenile HSCT unit. Method: Descriptive study, of the experience report type, based on the assistance provided by the multidisciplinary team in a HSCT unit, with a focus on playfulness and humanization.

Results: Strategies and actions carried out by the multidisciplinary team responsible for the HSCT unit use play to minimize the impact caused by therapy, as well as to promote the humanization of care. The devices used are listed according to the identified demand, and within each strategy used, the individuality of each patient is sought. Among the strategies used, we can mention: the use of the "affective medical record", a tool in which the patient brings the way he likes to be called, who will accompany him and his preferences (characters, activities, dreams) (figure 1); the use of both donor and patient certificates given at discharge (figure 1); consultations carried out together to promote meaningful activities for patients, such as cooking activities (figure 2); use of a ludic context through the patients' preference, as a way of performing the procedures, as well as minimizing their impact (laser therapy, goniometry, anthropometry, dressings); use of recreational resources to help explain the treatment and the procedures to be performed, such as, for example, explaining what HSCT is, the use of a nasoenteric tube (NET), the importance of rinsing with Chlorhexidine, the use and care of the catheter, surgical procedures, among others (figure 3); Celebration of taking the marrow through a party with a theme chosen by the patient, where both the child and adolescent, as well as their family members, participate in the process of making them (figure 4).

Conclusion: The ludic should be seen as a therapeutic tool that, in addition to promoting a more humanized assistance, also collaborates so that children and adolescents undergoing HSCT have less traumatic experiences, helping in the treatment process and aspects experienced, thus contributing to a better quality of life.

Keywords: Playful. Multiprofessional Team. Hematopoietic stem cell transplantation.

FIGURE 1: Affective record and certificates (donor and patient)

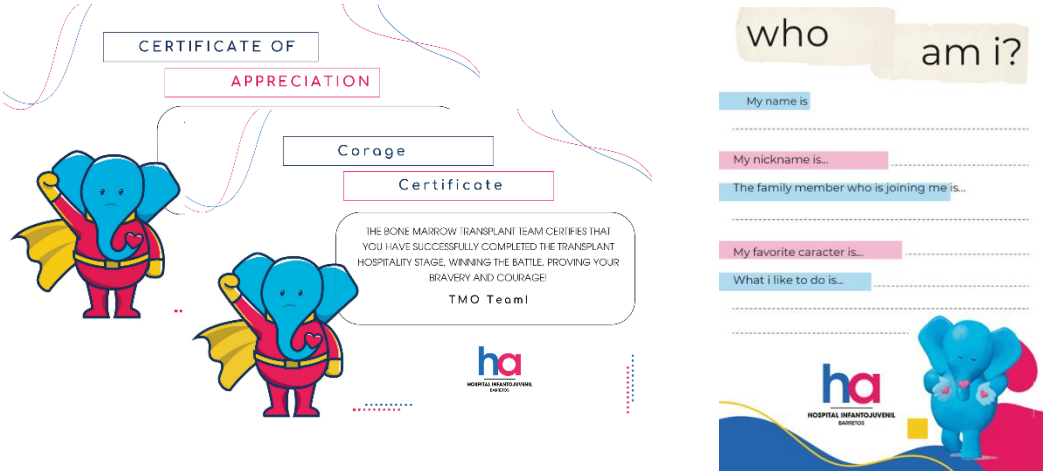

FIGURE 2: Culinary activity

FIGURE 3: **Playful resources**

FIGURE 4: **"Pickup" cake**

POSSIBILITIES OF OCCUPATIONAL THERAPY WITH CHILDREN WITH FANCONI ANEMIA: EXPERIENCE REPORT IN A BONE MARROW TRANSPLANT SERVICE

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Introduction: Fanconi Anemia is an autosomal recessive genetic disease, which can present progressive cytopenias, resulting in impaired performance of bonne marrow functions. The underlying disease can directly affect body structures, with a focus on the skin and upper limbs, cognitive aspects and social interaction. Currently, Bone Marrow Transplantation is the most indicated treatment for the control and potential cure of hematological symptoms, and it demands long periods of monitoring and isolation. As a result, the child suffers from occupational disruptions during the hospitalization process and frequent care follow-up at the institution until at least 100 days post-transplant, which interfere with occupational performance and neuropsychomotor development.

Objective: To present possibilities for Occupational Therapy to work with children with Fanconi Anemia during the hospitalization process and frequent follow-up until the first 100 days after the Bone Marrow Transplantation procedure.

Method: Experience report in a university hospital in the south of the country.

Results: Motor and cognitive demands were observed that interfere with the occupational performance of playing, education, social participation and activities of daily living, which are related to the underlying disease and treatment. Through ludic activities, the occupational therapist can develop functional, make-believe and symbolic play, aiming at the occupational performance of activities of daily living, stimulating cognitive, motor, procedural and language skills. Strategies are also developed to empower and favor the protagonism of all care agents in the child's treatment, helping to approach the care team and knowledge about the procedures performed. Other interventions can be carried out, aiming to actively listen and receive caregivers' demands, who also experience disruptions in their daily lives.

Conclusions: Through a practice centered on the client, the occupational therapist can provide assistance in order to develop strategies that aim to enhance and/or maintain motor, cognitive and social skills during the hospitalization and isolation process, mainly through the engagement in ludic activities. Through adaptations that allow knowledge about the treatment, effective communication with the team, the enrichment of daily life and strengthening of bonds with caregivers, it is possible to favor adherence to treatment and permanence in the unit.

Keywords: Occupational Therapy. Fanconi Anemia. Hospitalized Child.

OTHERS

ARRABIDAEA CHICA VERLOT MUCOADHESIVE GEL FOR TREATMENT OF MUCOSITIS IN PATIENTS WITH ONCO-HEMATOLOGICAL DESEASES UNDERGOING BONE MARROW TRANSPLANTATION

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Oral mucositis (OM) is an important and common adverse effect resulting from chemotherapy and radiotherapy of malignant neoplasms. Over 90% of patients undergoing hematopoietic stem cell transplantation develop the disease. The development of the lesion is in three stages where there is release of reactive oxygen, inflammatory mediators, and an infectious process. Previously Arrabidaea chica Verlot (Bignoniaceae) standardized crude extract efficacy showed structural organization of collagen fibers and promoting tissue repair in animals. Herein the therapeutic potential of A. chica extract in the treatment of oral mucositis in patients undergoing bone marrow transplantation (BMT) compared to standard treatment with low-intensity laser is reported. Fifteen eligible participants entered this randomized, cross-sectional study (October 2022 to May 2023). The clinical trial took place at Bone Marrow transplant (BMT)service of Clinic Hospital, University of Campinas (HC-Unicamp), approved by the ethics and research committee of UNICAMP (CAAE: 55933516.3.0000.5404).Included are: patients with onco-hematological diseases submitted to BMT, individuals with oral mucositis from grade 1, both sexes aged over 18 years. Patients with ulcerative lesions or infections in the oral cavity before chemotherapy treatment were excluded. Participants were randomized to treatment with 2.5% Arrabidaea chica mucoadhesive gel (chica group) or to low-intensity laser treatment (Laser group). The chica group uses the mucoadhesive gel three times daily, applying the product to the entire length of the lesion, after oral hygiene. The Laser group was treated with low intensity laser (850nm) for 20 seconds at each site of the lesion daily. Photos of the affected area assessed wound progress monitoring both groups. The outcome was according to the healing time in days and pain assessment monitored by visual analogue scale (VAS). Fifteen participants were included in the survey, chica group (n=8) and laser group (n=7). Two participants were discontinued, remaining 13 who completed the treatments, chica group (n=8) and laser group (n=5). When analyzing the healing time, the chica group took an average of 5.5±0.9 days, whereas the laser group took an average of 11.4±3.6 days. As for VAS, the pain average at the beginning for the chica group was 6.4±2.1 and for the laser group was 4.6±2.7. At the end of healing, the chica group reported an average of 0.1±0.3 and the laser group 1.6±2.1. Although a greater number of participants are required to have statistical data, A.chica gel is demonstrating to be an option for the treatment of mucositis considering the wound healing outcome. Among the benefits, that this product provides, is a shorter healing time outcome together with an economy in hospital cost. Further data of a larger group of patients that are undergoing clinical trial will corroborate data reported herein.

Keywords: Arrabidaea chica Verlot. Oral mucositis. Bone marrow transplantation. Wound healing.

HEALTH EDUCATION AS A CARE STRATEGY FOR PATIENTS WITH MUCOSITIS AFTER HEMATOPOIETIC STEM CELL TRANSPLANTATION: A MULTI-PROFESSIONAL EXPERIENCE REPORT

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Introduction: Health education is part of the work process of the multidisciplinary team. It is a strategy that provides the transmission of knowledge, as well as stimulates autonomy, participation, and protagonism of the subjects in their care. In the context of Hematopoietic Stem Cell Transplantation (HSCT), guidance helps to cope with the side effects of chemotherapy drugs used in high-dose conditioning. One of the side effects secondary to chemotherapy is mucositis, which is a common complication after HSCT, and directly impacts the quality of life of patients during hospitalization, which can cause systemic infections, weight loss, and in some cases,delays in the treatment and, consequently, an increase in the length of hospital stay.

Objective: To report the experience of the multidisciplinary team in the health education process with a focus on post-HSCT care for patients with mucositis.

Methods: This is an experience report of multidisciplinary residents who work in an onco-hematology service at a reference hospital for HSCT in the south of the country.

Discussion: When HSCT is indicated, health education facilitates the patient's understanding from diagnosis to discharge. In this context, the multidisciplinary team plays a key role in care strategies for various complications arising from this process. The daily performance of the multiprofessional team in the evaluation of clinical conditions and food acceptance makes the team an important tool in the prevention and treatment of mucositis. In addition, non-pharmacological approaches encompass the main care of the multidisciplinary team, such as: the stimulation of daily oral hygiene with soft brush and non-abrasive toothpaste or use of chlorhexidine-based mouth rinses, the application of low power laser by stomatology, mouthrinses with chamomile tea, change the consistency of the diet, giving preference to liquid and pasty foods, avoiding acidic, spicy and salty foods, orient about the benefits of cryotherapy to help with pain and discomfort by making available popsicles and ice. These are some examples of guidelines used in the daily routine by the assistant team that complement the care and stimulate self-care and autonomy of onco-hematologic patients.

Conclusion: Multidisciplinary guidance is an important tool in caring for the patient and caregiver during the post-HCT period, allowing access to information and health education for the prevention and management of symptoms resulting from mucositis associated with high-dose chemotherapy. It is noted that this is a positive approach that assists patients in building their autonomy, in understanding the care needed for this complication, and, as a consequence, in their recovery process.

Keywords: Health Education. Oncology. Hematopoietic Stem Cell Transplantation. Mucositis. Multiprofessional team.

HOUSEHOLD VISIT IN THE POST STEM CELL TRANSPLANT HEMATOPOIETICS: SOCIAL WORK AND OCCUPATIONAL THERAPY PERSPECTIVES

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Introduction: The present study addresses the relevance of household visits to patients living in a countryside city of Rio Grande do Sul, after hematopoietic stem cell transplant (HSCT), which are autologous or allogeneic. After hematopoietic stem cell transplant several precautions are necessary since the patient's immune system is weakened and in gradual recovery, thus the home visit as a work instrument allows the specific guidelines to be passed on to the biopsychosocial context in which the patient is inserted, as well as the singularities of each subject.

Objective: The household visit aims at identifying the housing conditions in which patients will stay after hospital discharge and consequently guide possible adjustments or necessary adaptations. In addition, there is the articulation with the support network that will accompany the patient in this process, which requires significant changes in the daily lives of people living in the same house. Therefore, the household visit is divided into the following stages: planning, execution, registration, and guidance.

Method: Experience report of occupational therapist and social worker residents on the importance of household visit, aiming at the patient's discharge in the post-hematopoietic stem cell transplant.

Results: Through the household visit it is possible to evaluate, guide and intervene in the socio-family reality and in the housing organization, in order for the patient to return home in conditions capable of maintaining the necessary care in this post-transplant process. Hence, the work of the occupational therapist in the household visit is to identify necessary adaptations for the patients to perform their occupations satisfactorily even with the restrictions and post-HSCT care, as well as guidelines for this performance, reflecting upon the performance of energy conservation techniques at home and the feasibility of modifying the disposition of objects. Likewise, the social worker professional uses the household visit as a powerful technical instrument to understand the patient support network, which is composed of people who live or not in the same house, and should also be attentive to map the territory and articulate with primary care services, such as the Basic Health Unit and the Social Care Reference Center of the territory, so that these services are aware of the patient's return to the territory.

Conclusions: On that account, household visit is extremely necessary, providing an expanded view, the integrality of care in the health service and the transversality of actions. The realization of household visit allowed us to direct the necessary actions and adaptations for the patient's return to his/her residence, providing security and well-being to them.

Keywords: Hematopoietic Stem Cell Transplant; Multiprofessional Team; Household Visit; Social Service; Occupational Therapy.

IMPORTANCE OF MULTIPROFESSIONAL RESIDENCY WORK IN THE EVALUATION AND MONITORING OF PRE AND POST HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Hematopoietic stem cell transplant can be used in the treatment of various hematological, immunological, oncological, and genetic diseases. During the transplant process it is important that the patient is evaluated by different professional centers, thus providing a broad view of health care, since it is a highly complex procedure. Aware of this need, the multi professional residency has the role of acting in an articulated manner in the evaluation and follow-up of patients pre and post hematopoietic stem cell transplant.

Objective: To report the importance of multiprofessional residency work in the pre- and post transplant evaluation of hematopoietic stem cells from the Pharmacy, Social Work and Occupational Therapy centers.

Method: Experience report of pharmaceutical, social worker and occupational therapist residents on the importance of evaluating and monitoring patients in the pre and post hematopoietic stem cell transplant outpatient clinic.

Results: Through the expanded view of each professional core, the demands and specificities of each patient are identified, thus enabling transplant planning through guidance on the necessary care, monitoring and possible adjustments related to each professional core during this process. The evaluation is made through an instrument created by each professional, namely: Social interview, Occupational performance questionnaire (contains the KATZ and LAWTON scales), Pharmacotherapeutic form. Through the social interview it is possible to screen demands and provide guidance on issues of social security or social benefits, school situation, support network, coordination with social assistance and health services, acting to guarantee rights and coping with expressions of the social issue. Based on the occupational performance questionnaire, one can identify the level of independence and functionality in performing activities of daily life, instrumental activities of daily life, leisure, health management, social participation, rest, and sleep. Following this, necessary guidelines/adaptations are given for the best performance of the occupations. Through the pharmacotherapeutic form, it is possible to chronologically evaluate the data related to the use of medications, such as desired effects, adverse reactions, and the concomitant use of drugs with other foods and/or active ingredients. Consequently, it is possible to intervene appropriately at each stage of the hematopoietic stem cell transplant process.

Conclusions: Therefore, the benefits of multiprofessional residency work with patients undergoing hematopoietic stem cell transplant showed its importance in the comprehensiveness of care and in the transversality of different actions, which perceive subjectivities in different ways, being able to act more effectively in favor of the subject's quality of life.

Keywords: Hematopoietic Stem Cell Transplantation; Multiprofessional Team; Health Integrality.

PERFORMANCE OF THE MULTIPROFESSIONAL TEAM IN A RESEARCH UNIT AT A PUBLIC HEMATOPOIETIC STEM CELL TRANSPLANTATION CENTER

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Introduction: Challenges and discoveries have driven advances in the area of hematopoietic stem cell transplantation (HSCT). This consists of a highly specialized procedure, performed in centers of excellence for the treatment of onco-hematological diseases. Due to the complexity of HSCT, a multidisciplinary team is required. These professionals must be at the forefront of the best therapeutic options and technological innovations. Therefore, participating in research is a premise for the development of a learning curve, giving the patient access to the best available treatments based on scientific evidence.

Objective: To describe the performance of the multidisciplinary team in a HSCT center in the coordination of clinical studies.

Methodology: This is a descriptive study on the performance of the multidisciplinary team in conducting clinical studies with the care team in a HSCT center from 2006 to 2023.

Results: To boost research in this area of knowledge, in 2006, the research unit was created. Since its creation, more than 150 research projects have been carried out. The current team consists of a physician, two research nurses and three data managers (pharmacist, nurse and administrative assistant), most of the team is part-time, involved in care and teaching (fig. I). Regarding the activities carried out by the team, the following stand out: registration of studies in the research unit; research team training; study work plan; preparation of Standard Operating Procedure (SOP); regulatory guidance to researchers; conducting ethical and regulatory flows; mapping of the sectors involved and management of research data. In 2023, a total of 29 projects are underway at research unit. The areas covered by the projects are described in figure II. Conclusion: Through this study, it was possible to share the role of the research unit and the performance of the multidisciplinary team in conducting clinical studies and data management. We emphasize the importance of this team's work with good interaction between professionals and continuous improvement of activities, for the proper conduct of studies following the principles of Good Clinical Practice (GCP).

FIGURE 1: This is an organization Chart – Research Unit, 2023.

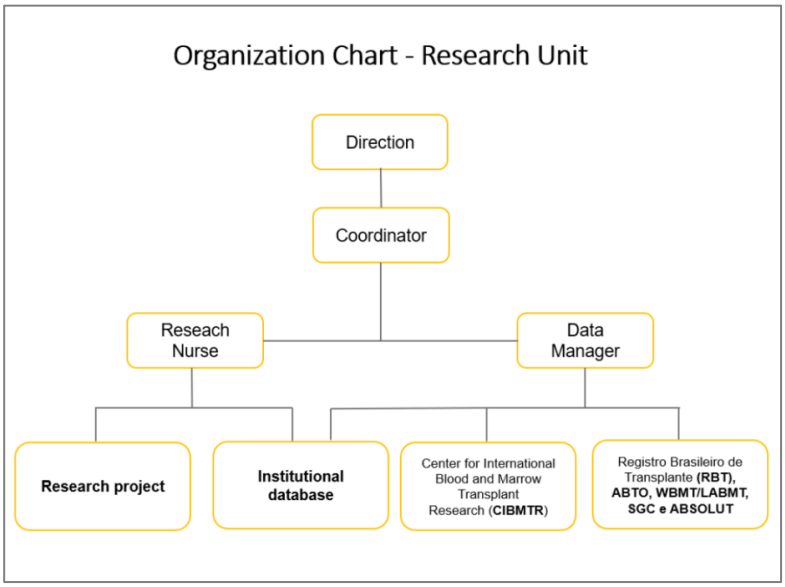

FIGURE 2: Professional category and thematic area of projects conducted at Research Unit in 2023.

Area	Thematic
Social Assistance	Away from home HSCT treatment program
Biologist	Viral Complications
	CLL: Immune factors, genetic e epigenetic
	Molecular Analysis of JAK2 mutation
	HSC expansion in umbilical cord blood
	AML pediatric patient chromosomal study
	HSC Gene Therapy
	MDS Genetic and epigenetic alterations
	HLA Complex and its association with GVHD developing
Biomedicine	Cryopreservation
	Cell Therapy
	T cell In vitro depletion
	Bone Marrow Cell interaction
	Covid-19 impact on the register of bone marrow donors
Nursing	Life Quality
	Quality indicators peripheral blood HSC collection
	HSCT Navigation program
Medicine	GVHD Prophylaxis
	ABO Incompatibility Impact
	Multicentric register of HSCT (CIBMTR)
	Haploidentical HSCT
	Pediatric with ALL survival and prognosis analysis
	Covid-19 impact on HSCT
	Ph+ patient survival analysis
Odontology	Oral cavity clinical evaluation
	Periodontal maintenance
	Laser therapy for mucositis prevention

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QUALITY OF LIFE OF HEMATOPOIETIC STEM CELL TRANSPLANT RECIPIENTS

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Introduction: The quality of life of HSCT recipients involves situations in the follow-up after the procedure and can reveal information that help the transplant team to seek better management of all the spheres that influence it. The SF-36 (Short Form-36) scale is a quality of life assessment questionnaire widely used in clinical and epidemiological studies in cohorts of HSCT recipients.

Objectives: To identify the results of applying the SF-36 scale in allogeneic and autologous HSCT recipients in the pre- and 100-day post-procedure phases. Methods: This is a descriptive study on the applicability of the SF-36 in autologous and allogeneic HSCT candidates who were treated at an oncological hospital in the interior of the state of São Paulo from August 2021 to May 2023. The scale measures the general health status of the patient in eight dimensions, such as: limitations by physical problems; limitations by emotional problems; pain; general health; vitality; social aspects; limitations by problems related to physical function; and limitations by problems related to emotional function. The data obtained were computed in spreadsheets and analyzed by R software, v4.1.0.

Results: Population data are described in Table 1, with the median age of participants being 48.1 years, of which 104 (58.8%) were male and 73 (41.2%). As for the type of HSCT, 62 (35%) were algenic and 115 (65%) autologous. The predominant diagnosis was Multiple Myeloma with 103 (58.2%) of the participants. Table 2 demonstrates that when comparing the pre-HSCT and 100 days after the procedure, it was observed that the functional capacity of the evaluated was better in the post-procedure phase than in the pre-procedure phase (p= 0.014). A decrease in pain was observed in 51.84% of the participants (p=0.004). Participants' vitality was significantly higher in the post-HSCT period, reported by 55.85% of participants (p=0.042) (Figure 1).

Conclusion: The SF-36 tool identified variations in the assessment of quality of life during HSCT periods, when applied in isolation. Other assessment instruments may be associated with the SF-36 to obtain broader and more accurate results.

Keywords: SF-36.quality of life. HSCT.

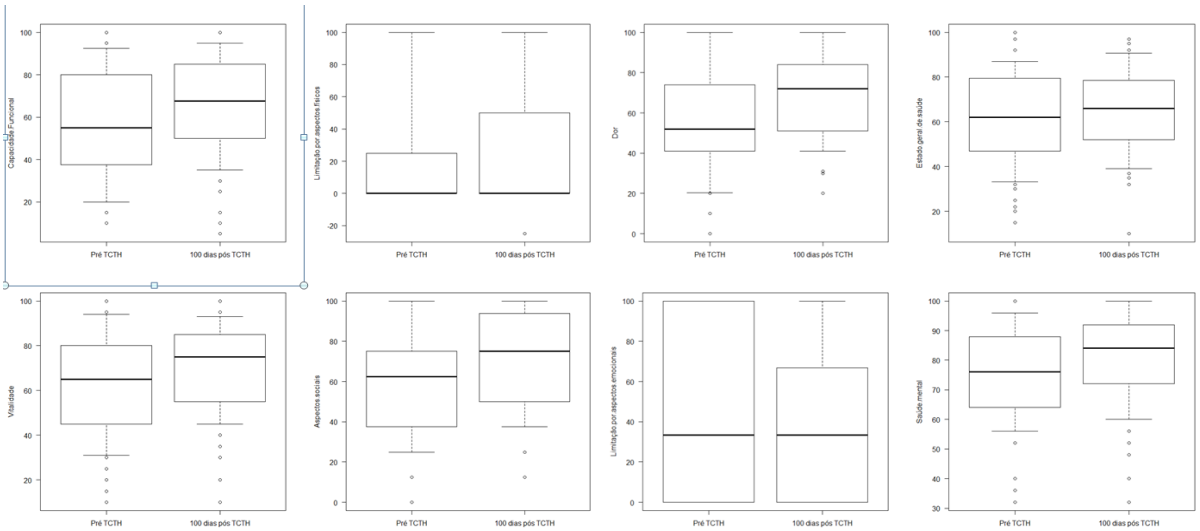
TABLE 1. Population Characteristics

	N (%)
AgeCTH	
mean(SD)	48.1 (15.7)
Sex	
Female	73 (41.2)
Male	104 (58.8)
Transplant type	
Allogenic	62 (35)
Autólogo	115 (65)
Donnor	
Related	26 (41.9)
Haploidentical	27 (43.5)
No-related	9 (14.5)
Diagnóstico	
Aplasia	6 (3.4)
Hodgkin's Lymphoma	8 (4.5)
Non Hodgkin's Lymphoma	4 (2.3)
ALL	21 (11.9)
AML	21 (11.9)
CML	10 (5.6)
MDS/MPN	2 (1.1)
Solid tumor	2 (1.1)
Source	
Peripheral Stem Cells (PSC)	131 (74)
Bone marrow (BM)	46 (26)

TABLE 2 - Comparison of SF-36 scores in the pre-HSCT and 100-day post-procedure periods.

	Pré HSCT	100-days post-HSCT	Test stat.	P value
Total	96	81		
Functional Capability			Ranksum test	0.014
median(IQR)	55 (38.8,80)	67.5 (50,85)		
Physical aspects limitation			Ranksum test	0.444
median(IQR)	0 (0,25)	0 (0,50)		
Pain			Ranksum test	0.004
median(IQR)	52 (41,74)	72 (51,84)		
General health condition			t-test (161 df) = 0.74	0.462
mean(SD)	62.6 (21)	65 (19.1)		
Vitality			Ranksum test	0.042
median(IQR)	65 (45,80)	75 (55,85)		
Social Aspects			Ranksum test	0.054
median(IQR)	62.5 (37.5,75)	75 (50,90.6)		
Emotional aspects limitation			Ranksum test	0.781
median(IQR)	33.3 (0,100)	33.3 (0,66.7)		
Mental Health			Ranksum test	0.067
median(IQR)	76 (64,88)	84 (72,92)		

FIGURE 1. Comparative analysis between periods and aspects of the SF-36



RESIDENT PARTICIPATION IN MULTIDISCIPLINARY HOSPITAL DISCHARGE PLANNING FOR ONCO-HEMATOLOGICAL PATIENT SUBMITTED TO HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Hospital discharge is an expected moment for onco-hematological patients undergoing Hematopoietic Stem Cell Transplantation (HSCT) and their families. The planning of pre-discharge guidelines is an important tool used by the professionals of the multidisciplinary team in the care transition. The patient's understanding and adherence to care minimize the occurrence of complications and readmissions. Psychosocial aspects are also worked on, in order to facilitate the reintegration of the individual into their environment, in addition to promoting the patient's autonomy and self-care.

Objective: To report the experience and importance of the multidisciplinary team in planning guidelines for hospital discharge in onco-hematological patients undergoing HSCT in a reference hospital in the southern region of the country.

Methodology: This is an experience report about the importance of planning hospital discharge guidelines for post-HSCT patients.

Discussion: Pre-hospital discharge guidelines are important after HSCT, as recovery and protection of the patient's health are essential during this period. They are carried out in a multidisciplinary way, seeking to contemplate the basic and essential needs of each individual. Topics such as: personal hygiene care, food safety, permitted and prohibited foods and encouragement of healthy eating. In addition, vaccines; acquisition of medication and guidelines for the correct administration of drugs; manipulation and administration of devices such as the nasogastric tube; catheter dressings and their maintenance; physical activity and leisure; return to the work routine; patient's social rights; access to Basic Health Unit; social security rights and other services of the socio-assistance protection network; situations in which an emergency must be sought; outpatient consultations, among others.

Conclusion: Multidisciplinary guidelines are essential in the transition of care for the patient and his family, providing access to information and space for clarifying doubts. It is noted that health education, carried out in a multidisciplinary way, favors understanding and adherence to care after hospital discharge, providing greater patient safety. Offering essential guidelines for self-care, planned according to the uniqueness and needs presented, allows adherence to treatment, the positive outcome of the transplant and avoids readmissions.

Keywords: Healthcare Models . Patient Care Team . Health Education.

THE ROLE OF THE HOME-AWAY- FROM- HOME HOUSES FOR BONE MARROW TRANSPLANT PATIENTS AND THEIR RESPECTIVE CARE COMPANIONS : A CASE STUDY OF THE PROJECT "MORE-BMTS" UNDER THE "INSTITUTIONAL DEVELOPMENT PROGRAM" SUPPORTED BY "THE-CONSOLIDATED-HEALTH SYSTEM"

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The objective of this study is to demonstrate the importance of the home-away-from-home houses for bone marrow transplant patients, donors and their care companions. The study includes not only quantitative aspects, but also evaluates social and cultural aspects and the interaction between the hospital system and the housing system.

Between 2018 and 2022, the average number of admissions for bone marrow transplants (BMT) at hospitals in the "Consolidated Health System" was 442 per year and the average hospitalization for those patients was of 29.78 days.

The project "MORE-BMTs" has been optimizing the patients waiting list for BMT by making 40 additional beds available, including those for halogenic transplants. The role of the home-away-from-home housing has been of extreme importance in this process.

Patients are referred from all geographic regions of the country, the logistics of their displacements along with those of their donors and the care companions demand a search for adequate lodging for before, during and after the treatments. The traveling, the long away-from-home time period , interruptions of their routine activities including regular jobs are some of the critical aspects that need to be considered.

The shortage in number of houses with adequate infrastructure to receive those patients poses an obstacle to all those involved in the process, including the health professionals.

Between June 2022 and May 2023 the "MORE-BMTs" project admitted 63 patients referred by the "National Transplant System" . Thirty of those patients were deemed eligible for and underwent transplant, 21 patients (70%) stayed at "home-away-from-home" houses and only 9 (30%) chose to stay at their own homes in the city of Sao Paulo.

The staying period at the home-away-from home houses varied between 107 and 163 days. Also of note is the burn-out experienced by most of the long-staying patients, which became more evident towards the end of the treatment.

The present study also collected data regarding average monthly wages (average gain is the national minimal wage, and in average , the patients have been jobless for ~ 6months) and school degree (low) of patients staying at the home-away-from-home houses; therefore, it has been extremely beneficial that the houses offer not only free lodging but also free meals and free transportation.

The need for larger number of and support to "home-away-from-home" houses for patients undergoing bone marrow transplant is emphasized.

Keywords: BMT, PATIENT, TRANSPLANT, BONE MARROW, HOME-AWAY-FROM-HOME.

TRANSPLANT CARE HOUSE: PLANNING AND IMPLEMENTATION OF A MODEL FOR EARLY PATIENTS DISCHARGE FOR THE OPTIMIZATION OF AUTOLOGOUS HEMATOPOIETIC STEM CELL TRANSPLANTATION IN SUS

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Introduction: Patients who need Hematopoietic Stem Cell Transplantation (HSCT) increase annually. During the HSCT process, patients remain hospitalized for a variable period of three to five weeks. Different from solid organ transplants, the queue for HSCT in the Unified Health System (SUS), in most cases, occurs to the lack of beds to perform the procedure. A strategy that can speed up the HSCT queue is the implementation of an early patients discharge model, already implemented in several countries and in private services. The requirements for autologous HSCT with early discharge include proximity and ease of access to the hospital, as well as hygienic conditions and isolation in the patient's home, facilitating access to patients treated by the SUS, who rarely meet these requirements. Our proposal is to provide a house prepared and adapted to host patients who undergo autologous HSCT in the aplasia phase, thus reducing the length of stay and optimizing the occupation of hospital beds.

Objective: To present the stages of planning and adequacy of a house that allows SUS patients undergoing autologous HSCT being discharged earlier with the aim to increase the number of transplants performed.

Method: A house less than 2km away from the partner hospital was purchased; preparation and adaptation of 10 private rooms for the patients and their care givers with accessibility, individualized bathrooms, planned with the help of infectious specialists to avoid community infections using, water filtration system for patient safety. We also provide outdoor area for leisure, in addition to rooms for psychology, physiotherapy, occupational therapy and social assistance. First, the hospital defines the criteria for selecting patients in the pre-transplant period after consensus by the multidisciplinary team, such as: social status, distance between home and hospital, availability of a 24-hour care giver and prior visit to the house to learn about the facilities and rules. After acceptance, patient will stay in this house, along with a care giver, for an average period of 20 days during outpatient follow-up that requires their daily presence for consultations, tests, transfusions, and antibiotics, as needed, until engraftment occurs or transfusion independency.

Results: Considering ten beds with and an average stay of 20 days per patient and the estimation that we will have an average occupancy of 70%. We expect to increase the number of transplants performed by the partner hospital, to 30 to 40%.

Conclusions: This pilot study in SUS will allow an increase in the number of HSCT performed, due to the hosting model of HSCT patients with early discharge optimizing the use of hospital beds and probably expanding this program to other public health programs therefore decreasing the queue of patients waiting for an autologous HSCT.

QUALITY AND DATA MANAGEMENT

ADHERENCE TO INTERNATIONAL PATIENT SAFETY GOALS IN THE BONE MARROW TRANSPLANTATION UNIT: USE OF AN INSTRUMENT

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Introduction: In 2013, the Brazilian Ministry of Health established the qualification of healthcare facilities through ordinance nº 529/2013, concerning patient safety protocols. Since then, healthcare institutions have been adapting to meet the requirements of these protocols through the International Patient Safety Goals, which include: 1. Correct patient identification, 2. Effective communication, 3. Safe surgery, 4. Reduce the risk of healthcare-associated infections, 5. Hand sanitation, 6. Minimize the risk of patient harm due to falls.

Objective: To present the strategy utilized to diminish non-compliance related to the International Patient Safety Goals in the bone marrow transplantation sector.

Method: Practical experience report from an oncology hospital in southern Brazil, addressing the development of an instrument utilized in the bone marrow transplantation unit from August 2022 to May 2023. An apparatus was created with specific parameters related to each goal: Whether the patient has the identification plate next to the bed, if they have an ID bracelet that is legible; If the patient has any allergies, whether they have the blue sticker on the bed identification and a blue bracelet with the medication clearly outlined; If the patient is peril of falls, whether the bed rails are raised, if they have the orange sticker on the identification sign of the bed, if they wear an orange bracelet, and if the fall risk scale is being conducted daily. If the risk of pressure injury scale is being conducted daily. If the patient has been informed and understands the reason for using bracelets and bed identification. If the healthcare team performs hand hygiene before procedures. If the team clarifies patient doubts with clear information.

Results: Starting from March 2023, the assessment using the apparatus was initiated, and non-compliance decreased from 22% to 3%. The compliance ratio according to each goal is presented below

Adherence to Patient Safety Protocol Aug.		2022 %		2023 %	
		Dec.	Mar.	May	
Intent 1	Patient identification	70,37	86,00	86,00	87,50
Intent 2	Effective communication	80,00	80,00	80,00	100,00
Intent 3	Safety in prescription, use and admnistration of medications	88,24	90,00	100,00	91,67
Intent 4	Safe surgery	88,89	83,00	83,00	100,00
Intent 5	Clean care is safe care – Hand sanitation	78,26	82,00	93,00	100,00
Intent 6	Reduce the risk of falls	51,52	80,00	78,00	98,18
Intent 7	Reduce chance of pressure injuries	85,71	95,00	95,00	100,00
Total		78,00	85,00	88,00	97,00

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DATA REPORT TO CIBMTR: 39 YEARS OF EXPERIENCE OF A BRAZILIAN PUBLIC HEMATOPOIETIC STEM CELL TRANSPLANTATION SERVICE

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Introduction: The first activities in the reporting of hematopoietic stem cell transplantation (HSCT) data are from 1972 through the pioneering initiatives of North American (IBMTR) and European (EBMT) registries[1]. Later, in the 2000s, the founding of the CIBMTR points to the consolidation of the North American registry. In 2022, the registry celebrated its 50th anniversary, with more than 600,000 patients enrolled in 500 centers around the world2. In Brazil, the partnership with CIBMTR began in the 1980s with the creation of Brazilian HSCT centers[3].

Objective: To analyze the data reporting profile of a Brazilian public HSCT transplant service that has been active for 39 years in the CIBMTR.

Method: This is a descriptive study carried out in a HSCT center that used institutional and Data Back to Centers (DBtC) data between 1984 and 2022. The reporting rate per year was calculated from the number of HSCTs reported divided by the number of HSCT performed at the institution multiplied by 100. To account for the number of post-HSCT visits, the Post-TED DBtC was used in visits from 100 days to 16 years. The difference between the data reporting date and the HSCT date was used to calculate the time between the performance of the HSCT and its reporting.

Results: The first data report carried out by the service occurred on 01/27/1985 and since then, a total of 1,788 HSCTs have been reported to the CIBMTR by December 2022, which represents 70% of all HSCTs performed at the institution (Figure 1). Over these 39 years, the reporting rate remained mostly between 80-100% (25/39). However, there were periods when the reporting rate was between 40-78% (8/39) and less representative between 7-23% (6/39) (Figure 2). The time between performing HSCT and reporting data decreased over the years (Figure 3). However, we believe that the outliers presented in the last decade may be associated with the retrospective reporting of HSCT that we adopted as an activity in the service. Regarding post-HSCT reporting, data were sent to the CIBMTR referring to 3,242 post-HSCT follow-ups between 1985 and 2020. It was observed that as post-HSCT time increases, the number of reports decreases (Figure 4). However, even with this reduction, the service recorded 39 long-term follow-ups between 10 and 16 years after HSCT.

Conclusions: The analysis of the 39 years of experience in reporting data to the CIBMTR brings positive points and challenges for the future. The positive points can be seen from the reporting of most HSCT performed in the analyzed period, the reduction of time between the performance of the HSCT and its reporting and the active work of retrospective rescue of HSCT. The challenges concern both maintaining the current high reporting rate and tools that can contribute to long-term monitoring and follow-up reporting. For this to happen effectively, a structured data management and reporting service with critical, reflective and purposeful professionals is required.

Keywords: data management; hematopoietic stem cell transplantation; management indicators; history

FIGURE 1 - Number of transplants performed at CEMO-INCA as well as those reported to CIBMTR from 1984 to 2022.

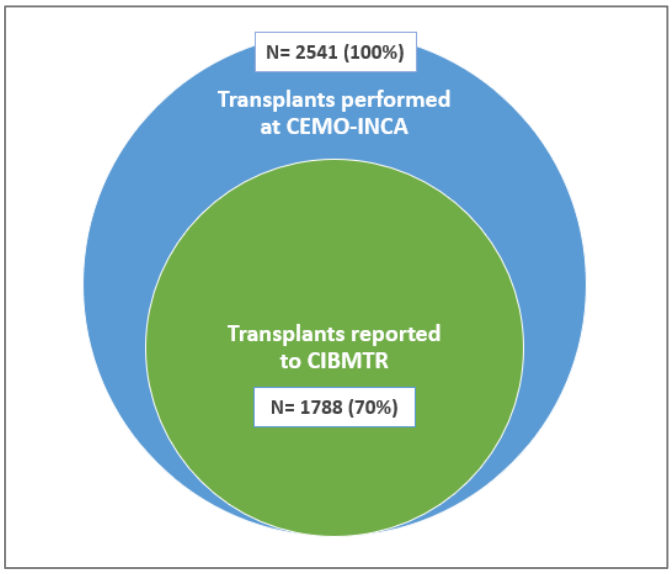


FIGURE 2 - Number of transplants performed at CEMO-INCA, reported to CIBMTR and Reporting rate between 1984 and 2022

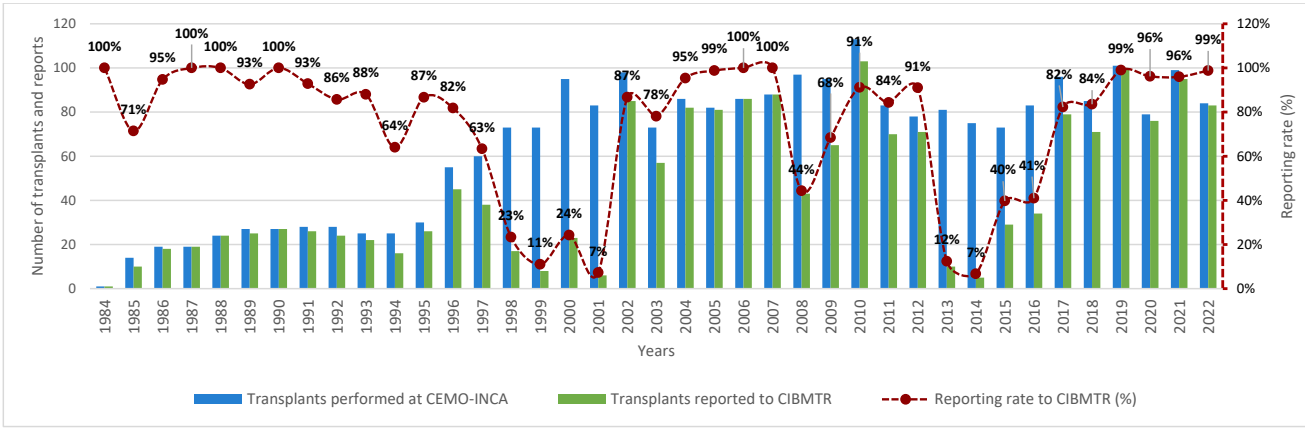


FIGURE 3 - Time between performing the transplant at the center and reporting data to the CIBMTR. Trendline in red.

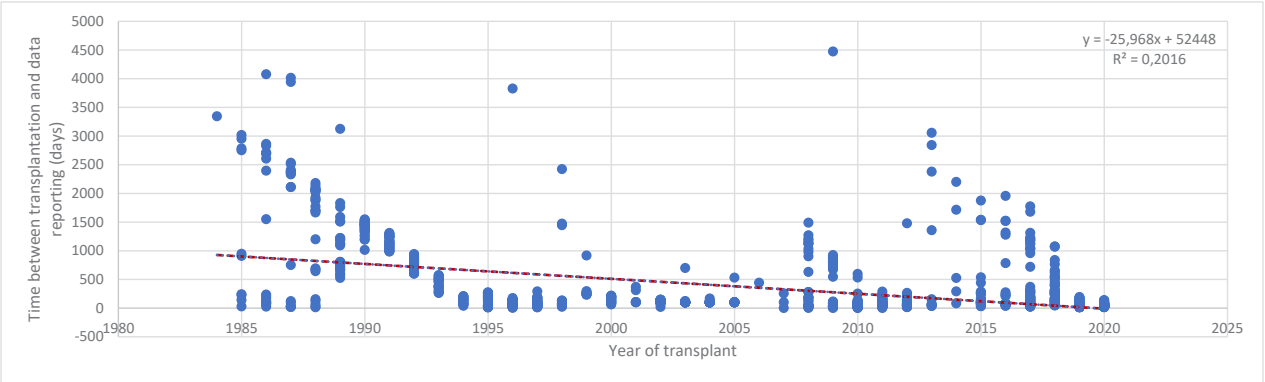
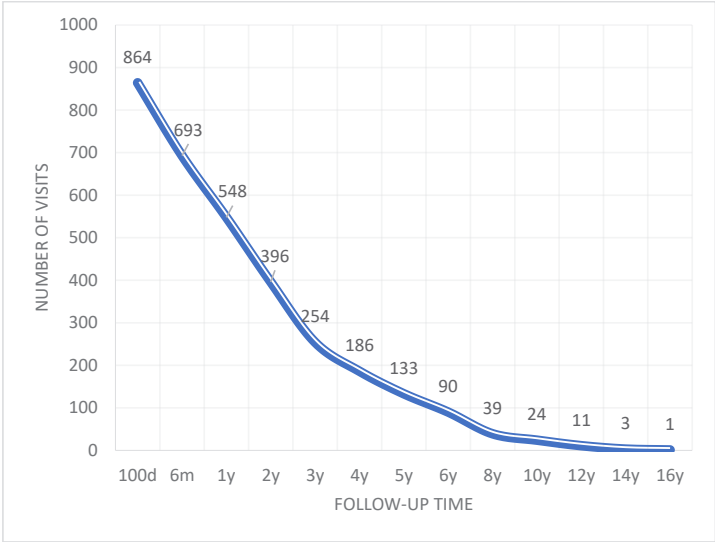


FIGURE 4 - Number of post-transplant visits reported to the CIBMTR between 1984 and 2020. Legend: d (day); m (month); y (year)



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EDUCATIONAL AUDIT PROCESS FOR HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT) REPORTS DURING A TRAINNING FOR DATA MANAGERS

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Introduction: External audits are widely used tools to validate internal processes and identify errors that would go undetected by quality programs, it verifies the veracity and ensures the accuracy of the information generated. Audits is a common and mandatory practice in US and Europe. There is no mandatory HSCT data report in Brazil, neither a systematized audit for this area. A Brazilian Nonprofit Organization promoted a 2nd edition of Training for Data Managers (DM) in HSCT, which aimed to train transplant center (TC) professionals to correctly enter the data in the HSCT records and analyze the data itself. All participating TCs agreed to undergo an Educational Audit (EA).

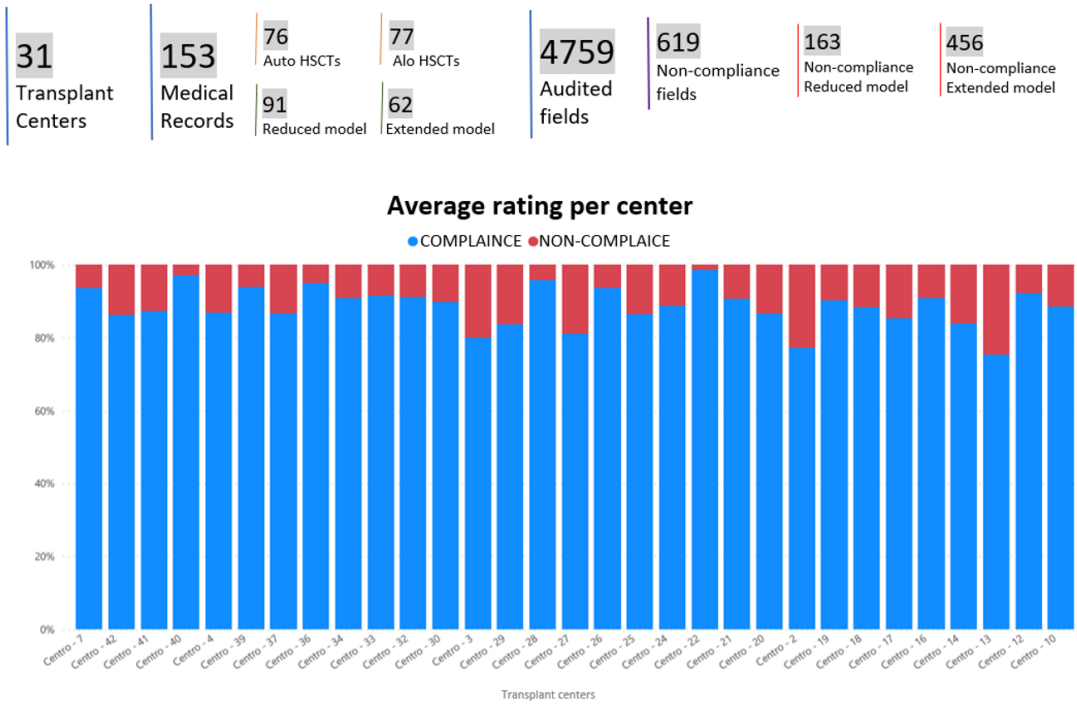
Objective: To present the results obtained during the EA process as part of the training for DM.

Method: A spreadsheet was prepared in two models: a reduced one (22 variables – autologous / 29 – allogeneic) and an extended one (74 variables – autologous / 109 – allogeneic), representing respectively the variables requested by the AMEO HSCT Map and by the essential data common to most international registries (CIBMTR and EBMT) (Table 1). Five medical records (2 extended and 3 reduced) of patients submitted to transplants performed in the year 2022, from each participating TC were selected. The audit was conducted virtually. All data sent by DM were compared with the documents and records contained in the medical record. The audited variables were classified as "compliance" and "non-compliance". The "non-compliance" items were subclassified into: 1-) Missing data in the medical record; 2-) Spreadsheet data differs from the medical record; 3-) Existing data not transcribed; 4-) Incorrect data in the medical record.

Results: 31 centers and 153 medical records were audited, totaling 4759 fields, of which 619 were scored as "non-compliance". The number of "non-compliance" items ranged from 4 to 40 among the TCs. The average of "non-compliance" in the medical records was 13% (Image 1).

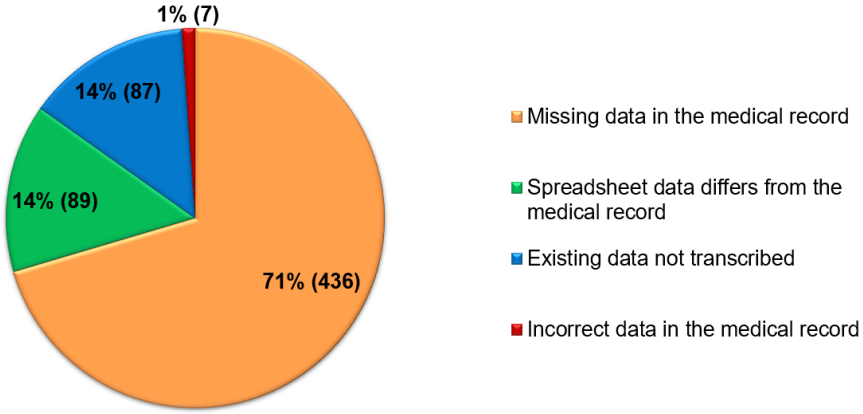
Conclusion: The EA showed that the highest frequency of "non-compliances" occurs due to the lack of recording information in the medical record. Standardization and implementation of a template with mandatory fields can help transplant teams systematically record missing data. We observed that the centers that participated in the first training had better quality in data reporting. The EA can provide support to TC programs improve the quality of their database.

Image 1: COMPARISON OF "% NOT COMPLIANT VARIABLES" BETWEEN NEW PARTICIPANTS AND PREVIOUS TRAINING PARTICIPANTS (N= 31 HCT CENTERS)



The most frequent type of "non-compliance" was "Missing data in medical records" with 71% (Image 2).

Image 2: DISTRIBUTION OF OCCURRENCES OF "NON-COMPLIANT" (N=619)



The variables that appeared more than 30 times as "non-compliance" were: HCT-CI Index (42), OTI History (42), Conditioning Rating (38), Previous Fungal Infection (36), VOD (36) and Karnofsky /Lansky (32) (Table 1).

Table 1: List of audited variables and frequency of "non-complaint"

REDUCED SPREADSHEET VARIABLES	EXPANDED SPREADSHEET VARIABLES		
ALLOGENIC subtype*	% Chimerism-2 Donor Cells*	Result Chimerism-3*	MM - Classification
Current HCT number	% Chimerism-3 Donor Cells*	Result Chimerism-4*	MM – ISS
Date of Death	% Chimerism-4 Donor Cells*	Result Chimerism-5*	Mono (MO)
Date of Relapse	% Chimerism-5 Donor Cells*	SAA – Transfusions	MRD pre
Health insurance or public health service	2nd HCT done after	% Chimerism-1 Donor Cells*	Neutrophil engraftment Date
Previous HCT type	ALL - Classification	% positive MRD	Non-Hodgkin's Lymphoma (NHL)
Previous HCT type	CML - Current BCR	Acute GVHD *	Other Malignancies
Transplant Type	CML - Current Cytogenetics	Acute GVHD date*	Patient Blood Type
Admission date	CML - Response Level	AML – Classification	Platelet engraftment >20,000 (yes/no)
Cause of Death	Chronic GVHD date*	CD34+ (CTP)	Platelet engraftment >50,000 (yes/no)
Cell Source	Date 2nd HCT	Chronic GVHD*	Pre-HCT Donor CMV *
Current status	Date 3rd HCT	Chronic GVHD grade*	Research Consent
Diagnosis	Date Chimerism-1*	Chronic GVHD Severity*	Result Chimerism-1*
Donor Age*	Date Chimerism-3*	Conditioning Protocol	State or Country
Donor Blood Type*	Date Chimerism-4*	Consent Date	Origin
Donor Gender*	Date Chimerism-5*	Cytogenetics date	Platelet engraftment Date >20,000
Follow-up date	Graft failure	Date Chimerism-2*	Platelet engraftment Date >50,000
Gender	Graft failure date	Diagnosis Cytogenetics	Pre HCT condition
HCT date (day, month, year)	MM - Durie & Salmon	Diagnostic MDS (WHO)	Pre-HCT Patient CMV
Primary Cause of Death	MM - light chain	GVHD prophylaxis 1*	Race
Relapse or Recurrence	Neutrophil engraftment (yes/no)	GVHD prophylaxis 2*	**Cell Viability**
Relationship*	New neoplasm	GVHD prophylaxis 3*	**Conditioning Classification**
Birth date	New neoplasm date	GVHD prophylaxis 4*	**Karnofsky/Lansky**
Date of Diagnosis	New neoplasm diagnosis	Hodgkin	**Prior fungal infection**
Discharge date	Nucleates (blood cord)	MAXIMUM Acute GVHD Grade*	**VOD**
HCT indication date	Other Leukemia - Classification	MAXIMUM Acute GVHD Grade date*	**HCT-CI Index**
Education	Result Chimerism-2*	MAXIMUM GVHD-Chronic date*	**Previous OTI history**
Match HLA*		MDS risk group	

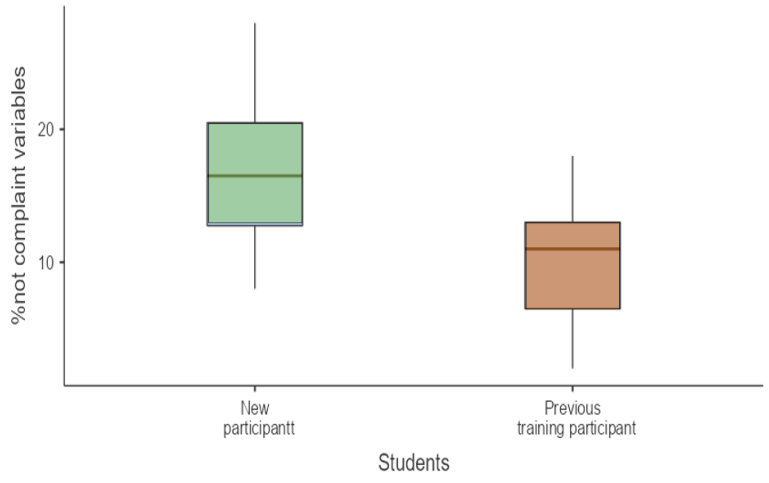
REDUCED SPREADSHEET VARIABLES:
- without "non-compliant" medical records for this variable
- 1 to 10 "non-compliant" medical records for this variable
- 11 to 20 "non-compliant" medical records for this variable
- 21 to 30 "non-compliant" medical records for this variable

EXPANDED SPREADSHEET VARIABLES
- Without "non-compliant" medical records for this variable
- 1 to 10 "non-compliant" medical records for this variable
- 11 to 20 "non-compliant" medical records for this variable
- 21 to 30 "non-compliant" medical records for this variable
- 31 to 40 "non-compliant" medical records for this variable
- Over 40 "non-compliant" medical records for this variable

*exclusive variables for allogeneic transplants

There was a statistically significant difference between the means of "non-compliance" for the TC who had already participated in the 1st training and those who are beginning in the 2nd training (t=-3.87, p=0.002) (Image 3).

Image 3: COMPARISON OF "% NOT COMPLIANT VARIABLES" BETWEEN NEW PARTICIPANTS AND PREVIOUS TRAINING PARTICIPANTS (N= 31 HCT CENTERS)



Paired samples t-test					
			Statistic	Gl	P
Previous training participant	New participant	t de Student	-3.88	14.0	0.002

IMPLEMENTATION EXPERIENCE OF VALUE-BASED HEALTHCARE METHODOLOGY ON BONE MARROW TRANSPLANTATION INPATIENT UNIT IN THE STATE OF PARANÁ

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Introduction: Value-based healthcare management projects to employ all available resources effectively, providing patients with necessary care while avoiding unneeded procedures and interventions, which ultimately result in inefficient asset utilization. By implementing the Diagnosis Related Groups (DRG) methodology, designed to group patients with similar clinical profiles, it is possible to optimize the efficient application of gurneys, increase patient safety, mitigate avoidable hospitalizations, and preventable readmissions.

Objective: To demonstrate the results obtained succeeding implementing value-based healthcare management in a bone marrow transplantation inpatient unit in Paraná.

Method: Experience reports from five nurse professionals involved in the implementation of the healthcare management methodology in the bone marrow transplantation inpatient unit of a philanthropic hospital located in Curitiba, Paraná.

Results: The aforementioned institution possesses a team of five nurses who integrate the DRG platform to generate indicators. Based on these indicators, they identify flaws in the system and develop strategies for active and preventive improvements in collaboration with the Hospital Infection Control Committee, Continuing Education, and the Patient Safety Unit. The implementation of the DRG platform started in 2020 in the bone marrow transplantation inpatient unit with the goal of patient-centered care, aiming for efficient bed utilization and the reduction of acquired conditions. In 2022, a significant percentage of waste was observed in the institution, with 14.7% compared to the national rate of 25.1%, based on 154 hospitalized patients. Regarding serious acquired conditions, in November 2021 the percentage was 15.38%, but in the same month in 2022, it was reduced to zero. These data demonstrate the efficiency of using this platform to improve hospital workflows.

Conclusion: The combination of institutional procedures and application of an artificial intelligence platform to reduce avoidable harm and waste has been satisfactory and directly impacts process improvement and patient care.

Keywords: Healthcare management; Value-based healthcare; Bone Marrow Transplantation Unit; Nurses; Diagnosis Related Groups.

IMPLEMENTATION OF HEMATOPOETIC STEM CELL TRANSPLANTATION UNIT INDICATORS

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The effectiveness of care processes is a worldwide concern for care managers, and is currently seen as the main objective in health systems, to ensure quality and safe patient care. With all the technological advances that allow the creation of new treatments and care protocols, patients are still exposed to various risks when undergoing health care, particularly in hospital environments. The monitoring and evaluation of the quality of health care takes place through indicators, quantitative measures of the desirable or undesirable results of a process, which, measured continuously and periodically, make it possible to verify the achievement of the objective. Indicators in a Hematopoietic Stem Cell Transplantation (HSCT) unit will contribute to high-impact changes in terms of quality and reduction of care risks inherent in care. However, current references on indicators inherent to the HSCT unit are scoped to the quantity and type of transplants performed. The nurse is considered fundamental in the process of managing and caring, and management is the basis of organization, assistance and the possibility of promoting the qualification of the nursing team, through continuing education, appropriating management models and strategies , the determination of the team and the technology used in the HSCT units. To define and implement quality indicators in the hematopoietic stem cell transplant unit. An integrative review was performed using the LILACS, MEDLINE, BDENF databases, using the following descriptors: oncology, quality, health quality indicators. Being adopted as inclusion criteria: articles published in the last five years, resulting in 21 analyzed articles. After analyzing the articles, a synoptic table was prepared, which presents a summary of the article, objective, methodology, main results and main markers of care and management quality. Thus, the indicators were divided into two categories: assistance, management. As the assistance focused on the quality of care and patient safety, the management for strategic issues, capacity and productivity of the unit. Thus, 12 sheets of care and 9 management indicators were built. The HSCT unit differs from other hospital units due to the profile of the patients, the way the disease is treated and possible complications. Therefore, it is essential to build indicators aimed at this type of unit in order to assess and monitor the quality and management of the unit. However, it is necessary to carry out new studies to evaluate the effectiveness of these indicators.

Keywords: Hematopoietic stem cell transplantation. Quality Indicators. Oncology.

TABLE 1: assistance and management indicators of the hematopoietic stem cell transplantation unit

Assistance Indicators	• Average Hospitalization Time; • Mobilization with Plerixafor; • Average Set Time; • Catheter-Related Bloodstream Infection; • Incidence of Phlebitis; • Incidence of Oral Mucositis; • Pressure Injury Incidence; • Fall incidence; • Incidence of Incontinence Associated Dermatitis; • Non-compliance; Medicated; • Loss of medical devices; •Incidence of infusion reaction
Management Indicators	• Tunover; • Absenteeism; • Continuing Education; • Personnel Dimensioning; • Occupancy rate; • Financial cost of the Unit; • Unit Profitability; • Number of transplants performed; • Number of registered transplant teams.

REDOME 30 YEARS – A BRIEF RETROSPECTIVE

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Introduction: Created in 1993 to meet the needs of Brazilian patients who did not have a compatible donor for hematopoietic stem cell transplantation, the Brazilian Registry of Volunteer Bone Marrow Donors (REDOME) was consolidated, becoming the third largest voluntary donors registry in the world with more than 5.6 million registered donors, serving Brazilian and international patients. Over these three decades, one of the great challenges has been to assure access for donors from different geographic regions and races, in order to guarantee the representativeness of the diversity of the Brazilian population.

Objective: To evaluate the profile of registered and transplanted donors since the beginning of REDOME activities, choosing the years 2000, 2011 and 2022 as time frames.

Results: Between 1993 and 1999, the registration of new donors occurred irregularly, on the initiative of the histocompatibility laboratories. From 1999, already under the coordination of INCA/MS, this activity was structured and the number of donors increased from 2414 (2000) to 680,140 (2011). In 2000, there was a hegemony of donors from the South and Southeast regions (91%), representing 63% in 2011. Likewise, there was an increase in the participation of donors from the North regions (0.45% in 2000 and 10% in 2011), Northeast (2% in 2000 and 18% in 2011) and Midwest (4.5% in 2000 and 9% in 2011). As of 2013, the inclusion of new donors began to be regulated by the Ministry of Health with limits established at the states, based on population and registration activity. In 2022, 111,136 new donors were registered with the participation of the North (7.5%), Northeast (24%) and Midwest (18.%) regions, and the predominance of registrations in the Southeast (38%) and South regions (11%). As a result of greater geographic diversity, we also observed an increase in the representation of brown and black people who, in 2022, represented 51% of registered donors against 43% who declared themselves white. In 2000, 61% of donors were white. Another aspect refers to the limitation of the inclusion of new donors up to 35 years, from 2022. Considering the donors registered in 2011, 9% are already inactive in the register due to age over 60 years, while another 20% must reach this limit in the next decade. For donors included in 2022, around 60% will remain active in the register for at least 30 years.

Conclusions: The observed results highlight the consolidation of REDOME's activity on the national scene with the increased presence of donors from different regions of Brazil and greater representation of blacks and browns. Although these data do not guarantee the inclusion of all the genetic diversity present in the Brazilian population, they can help in the evaluation of the registration strategies used and should be used by studies that compare demographic data with genetic information.

REDOME 30 YEARS – IMPORTANCE IN THE INTERNATIONAL SCENARIO

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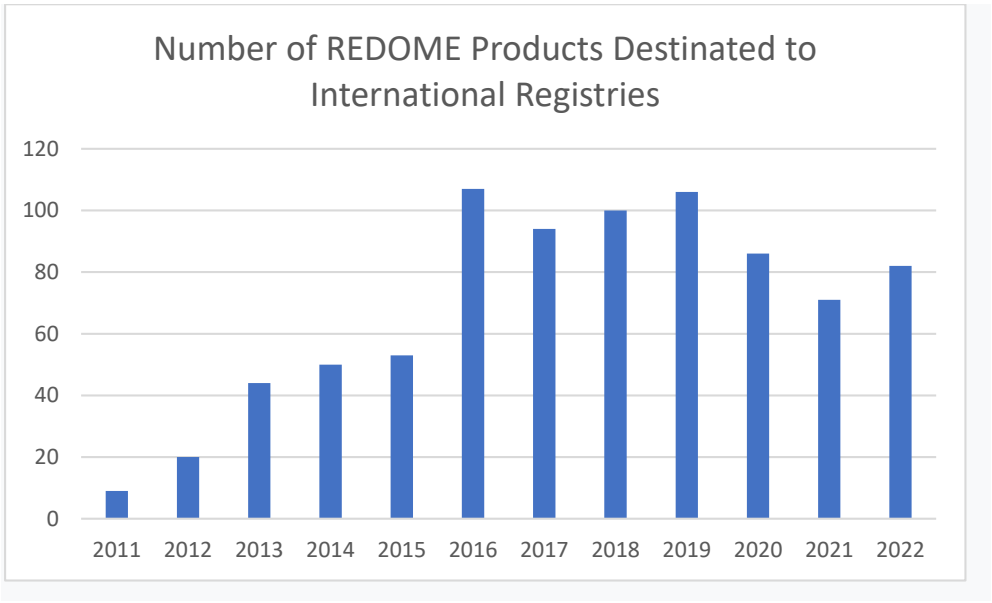
Introduction: Created in 1993 to meet the needs of Brazilian patients who did not have a compatible donor for hematopoietic stem cell transplantation, the Brazilian Registry of Voluntary Bone Marrow Donors (REDOME) has become the third largest donors registry in the world, currently with 5.6 million donors. As part of an international cooperation network that brings together registries from 65 countries, REDOME has become an important registry in offering donors to the international community. This activity also promotes the generation of financial resources that guarantee the balance of expenses for Brazilian patients - currently, the average cost of a product (bone marrow or peripheral blood apheresis) for a Brazilian patient treated by REDOME is R$ 150.000, which may exceed R$ 200.000.

Objective: To describe the result of REDOME's international activity, in offering products from Brazilian donors to different countries.

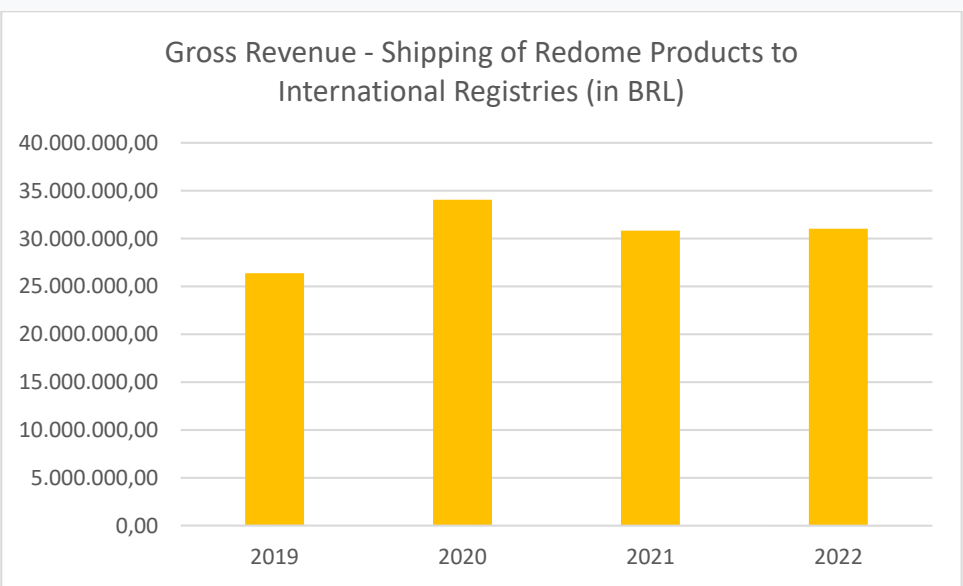
Results: Between 2008 and 2009, REDOME enabled the donation of 9 Brazilian donors to international registries and from 2011, this activity was established and grew significantly, as shown in the graph below.



The main destination for products from Brazilian donors is the USA (34%). Other destinations include Argentina (8%), Germany (8%), Spain (8%), England (5%), Netherlands (4.5%) and Australia (2%), which proves the importance of Brazilian population diversity to different countries.

During the Covid-19 pandemic, there was a significant reduction in this activity, which can be attributed to the impact of the pandemic on health services. In recent years, this activity has also generated significant revenue for REDOME, which has ensured the maintenance of international search activities aimed at Brazilian patients.

In the period from 2019 to 2022, the expenses of the REDOME Program related to donor logistics and the importation of cellular products for Brazilian patients were approximately R$ 36 million/year and the revenue obtained from REDOME's international activity was R$ 30 million/year.



Conclusion: The observed results highlight the consolidation of REDOME's activity on the international scene as part of a large cooperation network that brings together registries and reaches patients from different countries. It also highlights the importance of this activity to guarantee the care of Brazilian patients. Expanding the capacity to meet international demands is also related to the search for balance and greater sustainability for this Program.

REGULATING AND AUTOMATING THE APPLICATION OF INFORMED CONSENT FORM IN THE RELEASE OF DATA TO THE CIBMTR OF A CELL THERAPY UNIT THROUGH REDCAP

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Introduction: A Brazilian multicenter study in bone marrow transplantation (BMT) was created to submit data to the Center for International Blood and Marrow Transplant Research (CIBMTR). The elaboration of an Informed Consent Form (ICF), respecting the patient's right to consent and assent to the use of its information was approved by the national Institutional Review Board (IRB) and included as part of the standard pre-BMT evaluation. In the process of applying the terms there have been changes, for some reasons such as the advent of COVID-19 and the awareness of sustainability. With this, the use of the electronic term has increased, and RedCAP is a widely used tool.

Objective: To describe the process of regularizing the sending of data to the CIBMTR, through the application and automation of the ICF in the routine of the BMT.

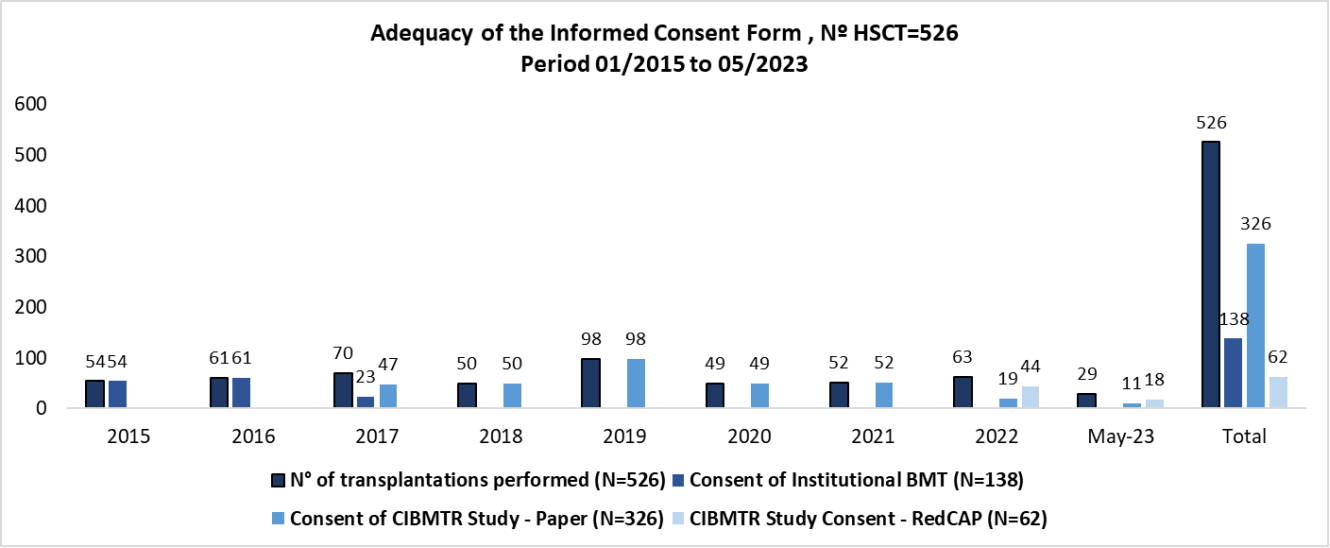
Methodology: Historical review of the development and sending of the ICF for sending data to the CIBMTR from 01/2015 to 05/2023. The physical terms were delivered in the pre-medical evaluation to the patient and/or guardian (1st copy) and another copy filed in the institution. To automate the sending of the terms, the RedCAP tool was used, where the logic of sending the digital terms is linked with the patient's age and email (patient or guardian), through the completion of the registration form (Figure 1).

Results: As a way to regularize the data submission to CIBMTR, a paragraph about this practice was included in the transplant term (institutional), where patients or guardians started to consent to the practice. From 09/01/2015 to 04/13/2017, 138 terms were signed. With the process of regularizing the use of the CIBMTR infrastructure as a national registry through a multicenter protocol, the study terms were introduced into the BMT routine. From 04/19/2017 to 12/31/2021, 311 terms were signed. To optimize and with the advent of the pandemic of COVID-19, in 2021, the development of the automation of the submission of the terms was started, through the RedCAP tool (Figure 2). In 2022, the use of digital terms began, where the patient and/or guardian received the terms by email, with the option of accepting or not accepting and receiving the 2nd copy of the ICF. According to records on the RedCAP platform from 05/2022 to 05/2023, 62 patients and responsible have accepted the electronic informed consent and 30 have signed the paper form, (Graph 1). With the validation of the use of the electronic term for the transplant, 4 patients signed electronically to send the data of the CAR T-cell to CIBMTR.

Conclusion: The ICF application process was adjusted according to the institutional and national standards, which guaranteed the right of the patient and or responsible party to be respected. The optimization of the process of sending the terms of the CIBMTR online was validated and is an initiative that optimized and reduced the use of paper in the routine of the BMT, besides emphasizing the awareness of sustainability.

Keywords: Hematopoietic Stem Cell Transplantation. Database. Data Management.

GRAPHIC 1: Application of informed consent



THE HEMATOPOIETIC STEM CELL TRANSPLANTATION AND CELL THERAPY BRAZILIAN REGISTRY (HSCT-CT/BR): WHAT HAVE WE ACHIEVED OVER THE LAST 8 YEARS?

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14 Hospital Walter Cantídio, Universidade Federal do Ceará, Fortaleza, BR

Introduction: Since 2016, efforts have been made to consolidate the Hematopoietic Stem Cell Transplantation and Cell Therapy Brazilian Registry (HSCT-CT/BR), aiming to better understand the national transplant activities and outcomes. Through the collaboration between the Brazilian Society of Bone Marrow Transplantation and Cellular Therapy (SBTMO) and the Center for International Blood and Marrow Transplant Research (CIBMTR), the HSCT-CT/BR was established in 2019.

Methods: A bibliographical and historical review of the actions that helped to establish the HSCT-CT/BR by the Data Managers Working Group (DMWG) of the SBTMO.

Results: The first affiliation of a Brazilian Hematopoietic Stem Cell Transplantation (HSCT) center to the CIBMTR occurred in the 80s. The National Cancer Institute (INCA), through the National Registry of Bone Marrow Donors and Brazilian Registry of Bone Marrow Recipients system, by recognizing the need for a registry, started discussing and taking the first steps toward its elaboration, which, however, did not materialize. In 2017, a multicenter HSCT study was approved and regulated to report the national data to the CIBMTR following Brazilian laws. The partnership between the SBTMO and the CIBMTR was officialized in 2019, resulting in a national dashboard with information from the Data Back to Center (DBtC). From 2016 to 2022, the number of active centers registered with the CIBMTR increased 209% (11/34), figure 1, coupled with a 171% (615/1,668), figure 2, increase in the transplants annually registered. To date, 65% (83/128) of the country's HSCT services have joined the study, with 54% (793/1,462) of the national allogeneic HSCTs having been registered with the CIBMTR in 2022. Approval of the multicenter HSCT study and regulation of national data reporting to the CIBMTR allowed the development of the first Brazilian Summary Slides published in 2021. The recognition of the HSCT-CT/BR by the National Transplant System and the certification by the

SBTMO issued to each HSCT service reporting their data were necessary steps to develop the Brazilian HSCT registry. In 2022, the Brazilian Summary Slides were updated with data from transplants performed between 2012-2022 (34 services and 9,868 HSCTs). Due to the increased interest in Brazilian HSCT data, a data request flow was created, supported by the GVHD and Late Effects Working Group (GEDECO) of the SBTMO. Until now, 37 requests for DBtC data analyses have been made.

Conclusions: The establishment of the HSCT-CT/BR required not only a close collaboration between the SBTMO and the CIBMTR, but the implementation of a national protocol. In addition, the increased interest observed and the publications of multicenter studies in Brazil have played an important role in engaging the HSCT community to report their data. This valuable information has helped consolidate and develop new projects to further advance treatments, long-term survival, and quality of life for HSCT patients.

Keywords: Data Management. Database. Cell Therapy.

FIGURE 1: Number of active Brazilian centers in CIBMTR per year

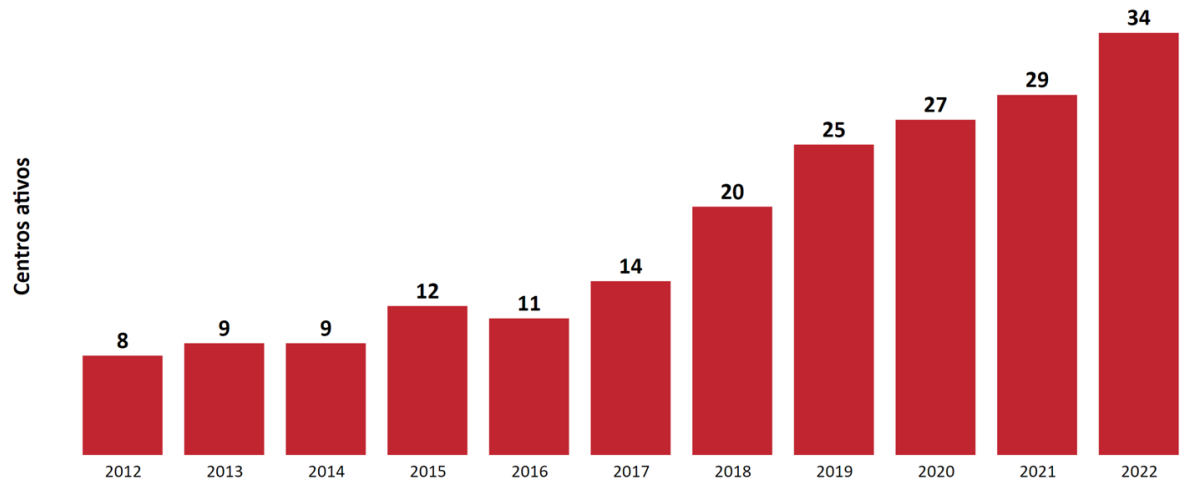
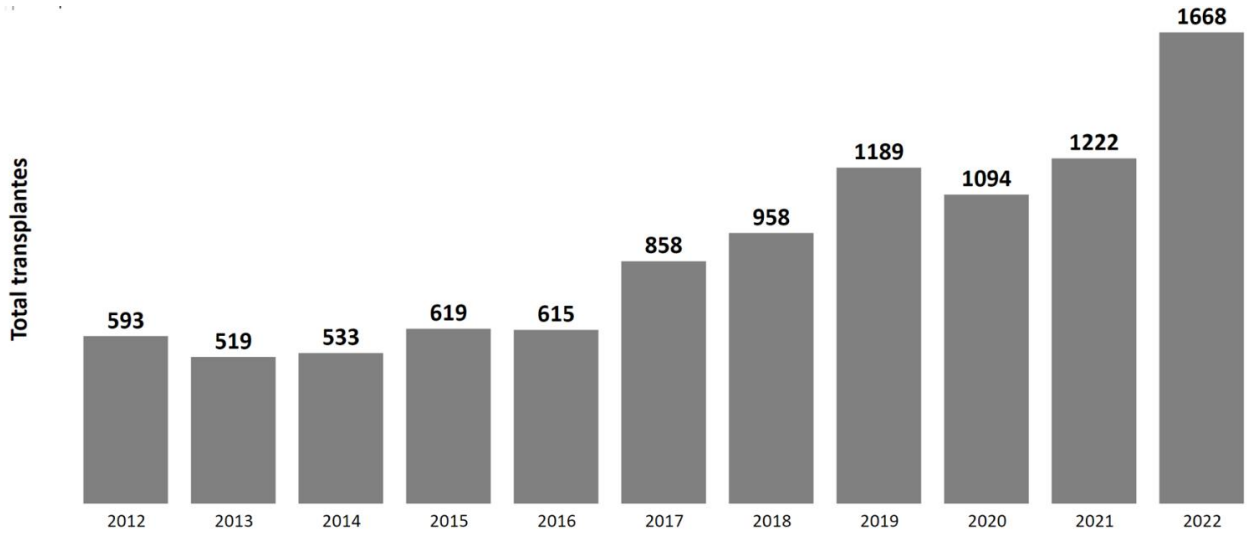


FIGURE 2: Total transplants registered from Brazil in the CIBMTR per year



THE USE OF INTERACTIVE FORMS AS A FACILITATING TOOL TO OPTIMIZE THE PROCESS OF CHECK DATA WITH THE MEDICAL TEAM

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Introduction: The collection and management of Hematopoietic Stem Cell Transplant (HSCT) related information is essential for centers to assess outcomes and their implications for quality of life and survival after transplantation. The Data Manager (DM), in an HSCT center, has an important task in updating the transplanted patient's data, filling out the forms according to the information available in the patient's electronic medical record (EMR). HSCT is a complex therapeutic modality with a high risk of complications, the adequate description of events in the medical evolution is fundamental to guarantee its quality. However, due to the complexity of the diagnosis and classification of these complications, the information recorded in the EMR is often insufficient to fill in the data requested by the registry, compromising data collection.

Objective: Develop tools to optimize the process of checking with medical team in cases of doubt for classification of Acute Graft-versus-Host Disease (aGVHD) and cause of death, standardizing the data that is reported to the Brazilian registry.

Methods: Classification of stage and grade of aGVHD is one of the main difficulties in reporting data in the team, these data are not always complete in the EMR with all the information that the DMs need to complete the forms, so these cases have to be discussed with the medical team. To improve this checking, a free tool was used to create interactive online forms with the stage classifications of each organ involved, automatically generating the maximum grade classification (Figure 1). The causes of death that are reported on the death certificate or in medical developments, which do not always match the groupings and classifications requested by the registry. To standardize this classification, a form (Figure 2) was created with the primary and contributing cause classification options following the guidelines available in the registry's manual. These forms are sent to the medical team through a corporate messaging application (WhatsApp).

Results: The tools generated have an interactive character, and the use of checkboxes made it faster to fill out the data. Sending it via corporate WhatsApp allowed access at an opportune time, without disturbing the daily routine of care. The medical team filled out the report and the data were accessed through the form's website, and a record was created in the EMR's evolution tab, documenting the information checking. Since there is a lot of information that the DMs need to complete the forms, the development of these tools was essential to improve data recording.

Conclusion: The strategy to create tools to streamline the data checking process is essential to optimize data reporting and interaction between the DMs and medical team. Standardizing the information available on the forms ensures data reliability, allowing data to be reported with confidence.

TRAINING FLOW FOR DATA ENTRY INTO THE CENTER FOR INTERNATIONAL BLOOD AND MARROW TRANSPLANT RESEARCH (CIBMTR) FOR A DATA MANAGER IN THE CELLULAR THERAPY UNIT

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1 Cellular Therapy Unit at Hospital Israelita Albert Einstein

Introduction: Data management in a cell therapy unit is fundamental to know the outcomes of the service, providing the possibility of improvement of the center. For data management to be done diligently, it is important to have a trained professional, data manager (DM), in the theoretical part of data inclusion and analysis.

Objective: To describe the training journey of a DM in the routine of the cell therapy unit of a philanthropic hospital in São Paulo.

Method: Testimonial and productivity survey of the DM training in the cell therapy unit, from 07/19/2022, to 05/28/2023.

Result: The training began on 07/19/2022, in person, with the presentation of the CIBMTR platforms (Formsnet3 and CIBMTR portal) and website, containing the manual for filling out the CIBMTR forms. To better understand the Hematopoietic Stem Cell Transplantation (HSCT) procedure and the dynamics of Formsnet3 (platform for inclusion of transplantation data and other cellular therapies), the "Educational Track for DM of the Brazilian Society of Cell Therapy and Hematopoietic Stem Cell Transplantation" was taken for 28 days (07/2022 to 09/2022), online, consisting of 7 modules. After this step, the DM started reading the manual for filling out the CIBMTR basic forms (Transplant Essential Data - TED). After 1 month of reading the manual, the practice of including clinical cases in formsnet3 began, through the accompaniment of a more experienced DM (DMe), in the practice of sending data to the CIBMTR and giving the necessary support to clear doubts. To ensure the quality of the process, the double checking of critical data was created, (initiating DM (DMi)) included the pre-transplant data, with his own access, and the DMe checked the information and submitted it). From 09/2022 to 05/2023, the DMi filled out 214 basic forms in the CIBMTR (Graphic1), being included in the HSCT case update dynamics, by accessing RedCAP, to check the terms of consents released by patients and parents. At the beginning of the DMi training, each form was completed in the average of 240', currently it is 64'. Throughout this process the DMi was introduced and had guidance to interact with other sectors involved in the transplantation process, this facilitated the completion of the HLA typing forms and product data, as well as issues of application of consent terms, with the HSCT nursing team, (Figure1). Currently, the DMi is being trained to fill out the more complex, Comprehensive Research Form (CRF) in the CIBMTR.

Conclusion: It was concluded that the online and in-person training was effective, where the professional was able to fill out the basic forms in the CIBMTR. However, the face-to-face training was complementary to the online training because it allows for teach-back, decreasing the likelihood of error. The manual and the course are also indispensable for the training because they provide an introductory form of teaching, allowing more agility throughout the data imputation process.

Keywords: Hematopoietic Stem Cell Transplantation. Database. Data Management.

GRAPHIC 1: Monthly Productivity of the Data Manager

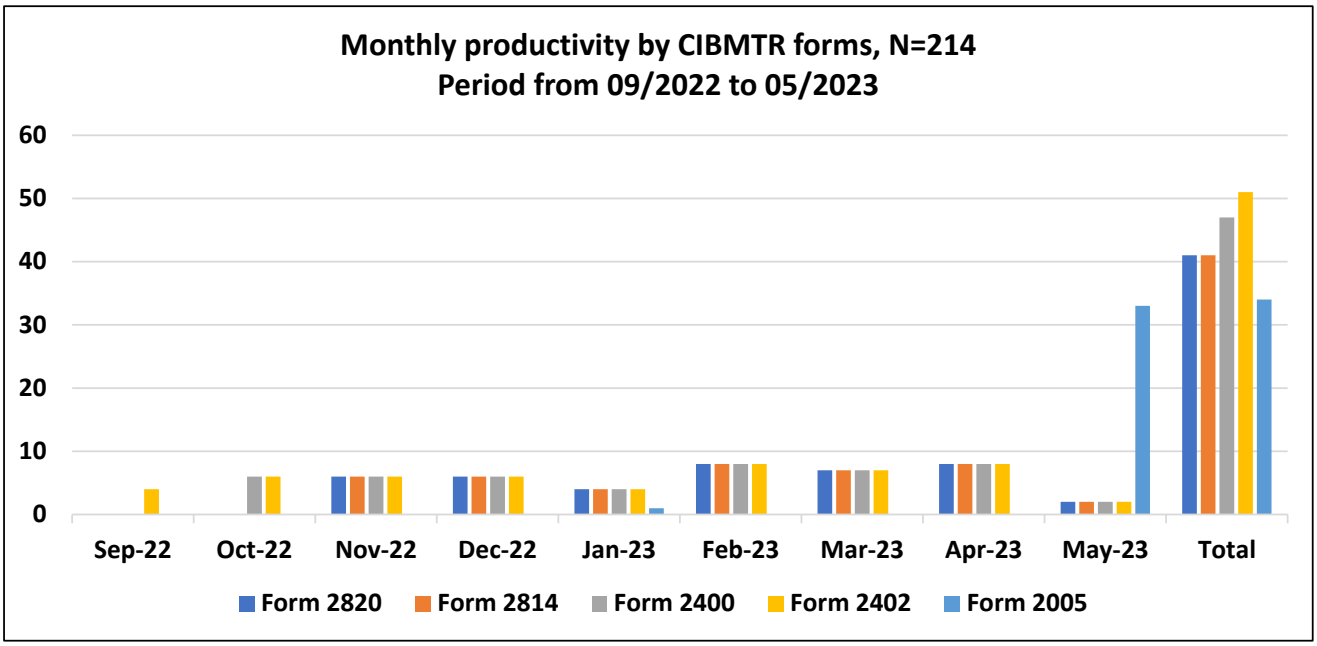
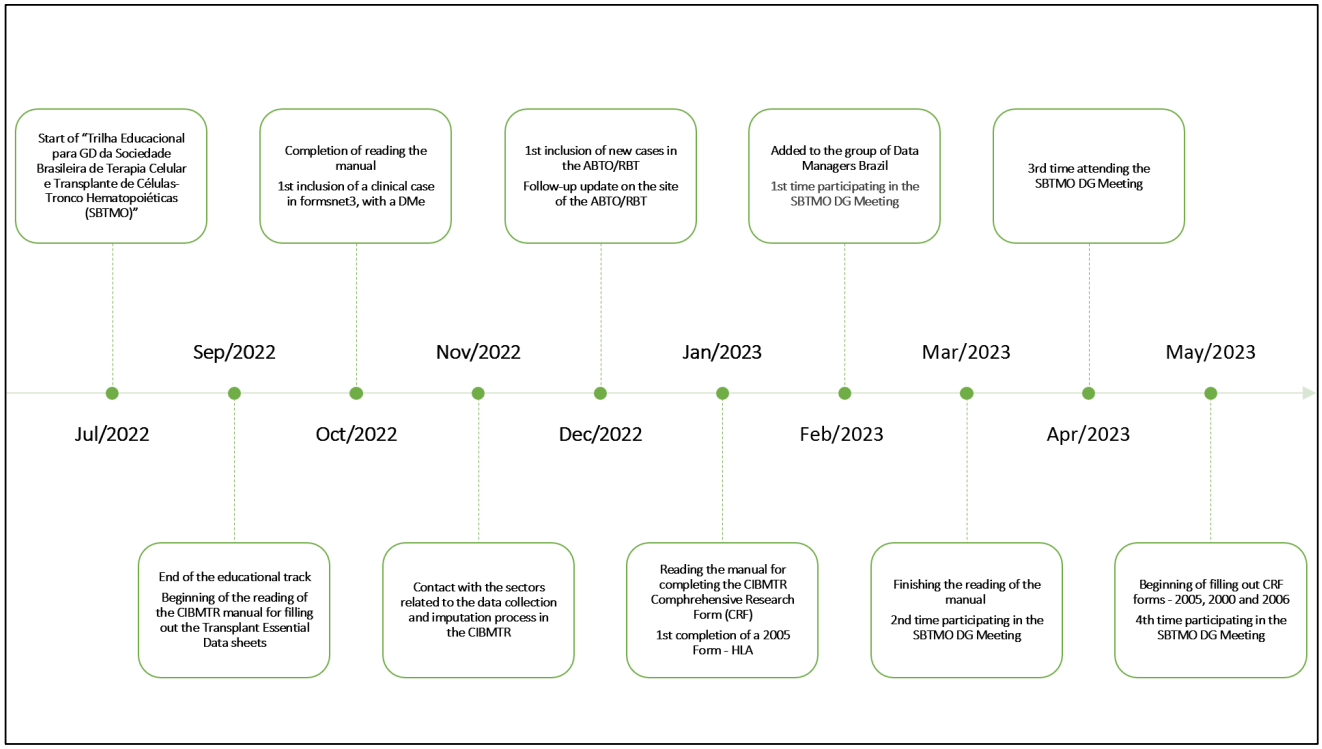


FIGURE 1: Timeline - Data Manager Training



USE OF REGISTRY DATABASES AS A SUPPORT TOOL FOR CLINICAL STUDIES IN HEMATOPOIETIC STEM CELL TRANSPLANTATION AND ITS ETHICAL CONSIDERATIONS.

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Introduction: The use of registry databases has proven to be a valuable tool for clinical studies in hematopoietic stem cell transplantation (HSCT) by enabling systematic and standardized collection of information about patients undergoing HSCT. This can facilitate continuous improvement in the quality of service by evaluating performance and management through indicators, aiding the decision-making process of the multidisciplinary team, including the assessment of final outcomes achieved in HSCT, and promoting the development of clinical protocols. However, the utilization of these databases for clinical research purposes necessitates a range of ethical and regulatory considerations.

Objective: To discuss the importance of regulatory aspects, the involvement of the research ethics committee, and ethical considerations in clinical research when utilizing prospective registry databases as a supporting tool for studies in hematopoietic stem cell transplantation (HSCT).

Methods: We describe the experience of a tertiary center in utilizing a registry database as a supporting tool for clinical studies in hematopoietic stem cell transplantation (HSCT). The database used was internally developed and built with standardized and mandatory variables, approved by the local research ethics committee. Data is systematically collected by a qualified professional from electronic medical records of patients undergoing HSCT at the center and includes information about the patient, the transplant procedure, and post-transplant follow-up.

Results: The utilization of registry databases in HSCT can provide valuable information for evaluating clinical outcomes, developing clinical protocols, and continuously improving service quality. However, the use of these databases for clinical research purposes requires special attention to regulatory and ethical aspects. It is important for the research ethics committee to be involved from the beginning of the project, and measures should be taken to ensure patient data privacy and confidentiality.

Conclusion: The utilization of registry databases in HSCT is crucial for conducting clinical studies and improving patient care. It is important for healthcare professionals involved in HSCT to be aware of these ethical issues and navigate the regulatory process so that measures can be developed to ensure the responsible and secure use of these data.

Keywords: Database, Hematopoietic Stem Cell Transplantation, Research Ethics.

USE OF STATISTICAL TOOLS FOR MONITORING AND CRITICAL ANALYSIS OF KEY PERFORMANCE INDICATORS IN A HEMATOPOIETIC STEM CELL TRANSPLANT CENTER

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Introduction: Hematopoietic stem cell transplantation (HSCT) requires intensive care and frequent medical monitoring in order to assess patients' recovery process and prevention of future complications. The implementation of key performance indicators (KPI) in HSCT centers is an important method to evaluate the quality of services provided, to identify problems and failures during the procedure, as well as to support decision making while providing opportunities for system improvement. Statistical tools are crucial allies in analyzing these indicators as they enable objective, systematic, and consolidated analysis of all generated data.

Methods: Our study's objective was to evaluate variables such as the type of transplant, neutrophil engraftment time, non-relapse mortality (NRM) rate and incidences of disease relapse and graft-versus-host disease (GVHD) from October 2018 to December 2022, from an HSCT center. Analyses of KPI were performed using descriptive statistics, such as the Kaplan-Meier estimator and the cumulative incidence function, utilizing R and Python programming languages and Stata statistical software.

Results: Our data showed median time to neutrophil engraftment for patients who performed autologous transplantation (autoHSCT) was 12 days (min 9 - max 26) versus 17 days (11 - 33) for those who performed allogeneic transplantation (alloHSCT). The NRM rate was 5.4% for autoHSCT versus 26% for alloHSCT. When analyzing the incidence of relapse, we observed a frequency of 25.5% in patients who underwent autoHSCT versus 16.7% in alloHSCT. Finally, the rate of acute and chronic GVHD in our center was 59.4% and 43.8%, respectively.

Conclusion: The use of statistical tools allowed a critical analysis of the KPIs in our HSCT center. Our results highlighted the importance of continuous monitoring of the main indicators. Moreover, the continuous collection of data enables comparisons with other national and international transplant centers, to improve quality of service and encourage centers' accreditation from international agencies, ensuring effectiveness and safety in patient care.

Keywords: Hematopoietic stem cell transplant. Key performance indicators. Statistical tools.

UTILIZATION OF PYTHON LANGUAGE FOR ROUTINE AUTOMATION IN HEMATOPOIETIC STEM CELL TRANSPLANTATION DATA MANAGEMENT

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Introduction: Hematopoietic Stem Cell Transplantation (HSCT) is a complex procedure that involves managing a large volume of data. In order to optimize this process, the utilization of data management systems such as REDCap (Research Electronic Data Capture) in conjunction with the Python programming language has proven to be an efficient option. This integrated approach offers significant benefits, enabling more efficient and accurate management of HSCT-related information.

Methods: Automation routines were developed using the Python programming language to collect, clean, analyze, and send data. Distinct data collection techniques were employed for each data source. For web-based hospital systems in HTML format, web scraping techniques were used to extract raw data massively, using packages such as BeautifulSoup, Requests, and Selenium. For PDF-based medical records, the Camelot package was employed to extract text comprehensively. Advanced OCR (Optical Character Recognition) techniques, with the assistance of packages like OpenCV and PyTesseract, were applied to extract data from images such as photos, scanned documents, and checkbox fields. The collected raw data was cleaned and structured using the Pandas package in conjunction with Regex functions and then automatically stored in REDCap through an API interface. Based on these structured databases, a series of Robotic Process Automations (RPAs) were developed, such as automating the production of institutional reports and the extraction/sending of information to other databases, such as CIBMTR's FormsNet3.

Results: The implementation of automation routines using Python in conjunction with REDCap has resulted in significant improvements in the data management process of HSCT. Additionally, the ability to communicate the results of these routines with other platforms, such as Stata and R, has facilitated data analysis. However, during the process of implementing system automation, several barriers were encountered, including the existence of different electronic hospital systems that do not communicate with each other or rely on outdated platforms, low investment in equipment with the necessary requirements to meet department's demands, and difficulties for the IT team in meeting growing needs due to limited resources, insufficient processing capacity, and a lack of expertise in specific areas.

Conclusion: The use of REDCap in conjunction with Python language has proven to be an efficient and accessible option for data management in an HSCT center, especially since Python and R are free and open-source tools. These tools have allowed for the automation of various stages of the process, contributing to the standardization and quality of the collected data.

Keywords: Automation, Programming Language, Python, Hematopoietic Stem Cell Transplantation.

CELLULAR THERAPY

ANALYSIS OF THE EFFICIENCY OF THE PROTOCOL FOR AUTOLOGOUS COLLECTION OF HEMATOPOIETIC PROGENITOR CELLS FROM PERIPHERAL BLOOD

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Background: The collection of Peripheral Blood Hematopoietic Progenitor Cells (PBPCs) is widely used for the treatment of patients affected by hematological diseases. The correct mobilization of CD34+ depends on several factors, including age, gender, diagnosis, and the mobilization regimen used. The collection of PBPCs is generally performed with granulocyte colony stimulating factor (G-CSF, 16µg/kg/day), a glycoprotein that regulates the production and release of functional neutrophils from the bone marrow. In the case of mobilizations that have not reached the desired number of cells (above 10x103/mL of CD34+), a chemokine receptor antagonist 4 (Plerixafor, 0.24mg/kg) is administrated to achieve the minimum number of cells necessary for a successful transplant.

Objective: To analyze the efficiency of the hematopoietic progenitor cell collection protocol in a hemotherapy service in Curitiba-PR.

Methodology: Retrospective descriptive analysis of autologous PBPCs collection data from the Pasquini Institute and Hemobanco, from January 2022 to March 2023. The parameters analyzed were the percentage of CD34+ cells in peripheral blood according to the mobilizing agent used and the evaluation of the final product.

Results: From January 2022 to March 2023, 96 patients who performed 135 collections of autologous PBPCs were analyzed following the institution's protocol: process three patient volumes, keep the anticoagulant infusion rate below 1.2, and may vary according to need. In the institution, the heparin protocol is used (5.000 IU of heparin in the ACD bag + 5.000 IU of heparin in the bag of the collected product) with the objective of decreasing the proportion of anticoagulant (ACD) leading to a decrease in the adverse effects associated with citrate toxicity. Of these patients, 58% required mobilization with G-CSF and Plerixafor. The mean collection of patients who underwent combined stimulation was 1.2, while patients who used only G-CSF was 1.65. Patients who performed collection only with G-CSF stimulation had a collection efficiency of 73.30%, while patients who received G-CSF + Plerixafor combined stimulation was 80.90%.

Conclusion: The group of patients who required combined stimulation presented a higher number of circulating CD34+ with this strategy, with a reduction of 27.2% in the number of collections to achieve the ideal cell count in the product, which made the individuals less exposed to the risks inherent to the procedure and presented greater efficiency in the collection.

Keywords: PBPCs Autologous. Plerixafor. G-CSF. CD 34+. efficacy.

ANALYSIS OF THE IMPLEMENTATION OF THE NEW TECHNIQUE FOR PROCESSING AND CRYOPRESERVATION OF HEMATOPOIETIC PROGENITOR CELLS FOR BONE MARROW TRANSPLANTATION AT THE CELL PROCESSING CENTER OF HEMOCE

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INTRODUCTION: The Cell Processing Center (CPC) of the Center for Hematology and Hemotherapy of the State of Ceará (HEMOCE) is responsible for the processing and cryopreservation of 3 transplant centers in the state of Ceará, two privates and one public. Since its founding, the volume freezing technique has been used. In order to improve the service provided, since December 2022, cryopreservation by cell concentration has been implemented (at the moment we use 300,000 cells/mm3). It is known that cryopreservation by cellularity reduces the risk of complications, mainly neurological, during infusion and reduces the amount of cell loss after cryopreservation.

AIM: To analyze the impact and safety of the new cryopreservation technique validated by the Cell Processing Center of HEMOCE, using the cell concentration method, used in the processing and cryopreservation of hematopoietic progenitor cells from mobilized peripheral blood (HPC-PB) for Autologous Bone Marrow Transplantation.

MATERIALS AND METHODS: A retrospective analysis of the patients assisted by the Hemoce CPC from December 2022 to May 16, 2023 was performed. The following parameters of the mobilized patients were evaluated:number of apheresis performed, age, diagnosis, number of cryopreserved bags, transplants performed, infusion reactions and neutrophilic grafts.

RESULTS: During the evaluated period, 48 autologous patients from three transplant centers in the state of Ceará were treated. The mean age of the patients was 49 years, ranging from 22 years to 74 years. The main indications for autologous BMT were Multiple Myeloma (54.16%), Non-Hodgkin's Lymphoma (25%), Hodgkin's Lymphoma (14.6%) and others (6.25%). 59 HPC-PB bags were collected (11 patients underwent two apheresis) and 172 bags of up to 100 mL were cryopreserved (average of 3 bags per collection). The previous average of cryopreserved bags when processing by volume was 2 bags per collection. Of the 41 transplanted patients, 23 (56%) had no infusion reaction, 18 (44%) patients reported mild reactions (nausea, vomiting and coughing). Of the 41 transplants performed, the average time for neutrophil grafting was 10 days, ranging from D+8 to D+12. Of the 59 products collected and cryopreserved by cell concentration, two were diluted with serum albumin (3.27%) and two did not require deplasmatization.

CONCLUSION: When validating the technique of processing and cryopreservation of MHC by cell concentration, collected by apheresis of mobilized peripheral blood, an increase in the average of cryopreserved bags was evidenced, before in cryopreservation by volume there were 2 per collection, by cell concentration this average was for 3. When analyzing the grafting data for the year 2022, the mean number of neutrophilic grafting was 10 days, compared to the year 2023, there was no change. The cryopreserved bags analyzed in this study were within the standard and stipulated goals, with desired results.

KEYWORDS: Hematopoietic Progenitor Cells (HPC) Cryopreservation by cellularity, Bone marrow transplantation (BMT).

ANALYSIS OF TRANSFUSION SUPPORT IN PATIENTS UNDERGOING ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION WITH ABO INCOMPATIBILITY AFTER IMPLEMENTING A PERSONALIZED TRANSFUSION MEDICINE PROGRAM

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Introduction: In allogeneic hematopoietic stem cell transplants (Allo-HSCT), ABO incompatibility is present in 30-50% of the cases, divided into major (25%), minor (25%) and bidirectional (up to 5%) and can originate post-transplantation complications. In our institution, since 2016, a personalized transfusion medicine program has been implemented based on the evaluation of the donor-recipient pair, which added the identification of isoagglutinin titers in non-isogroup transplants for a differentiated intervention.

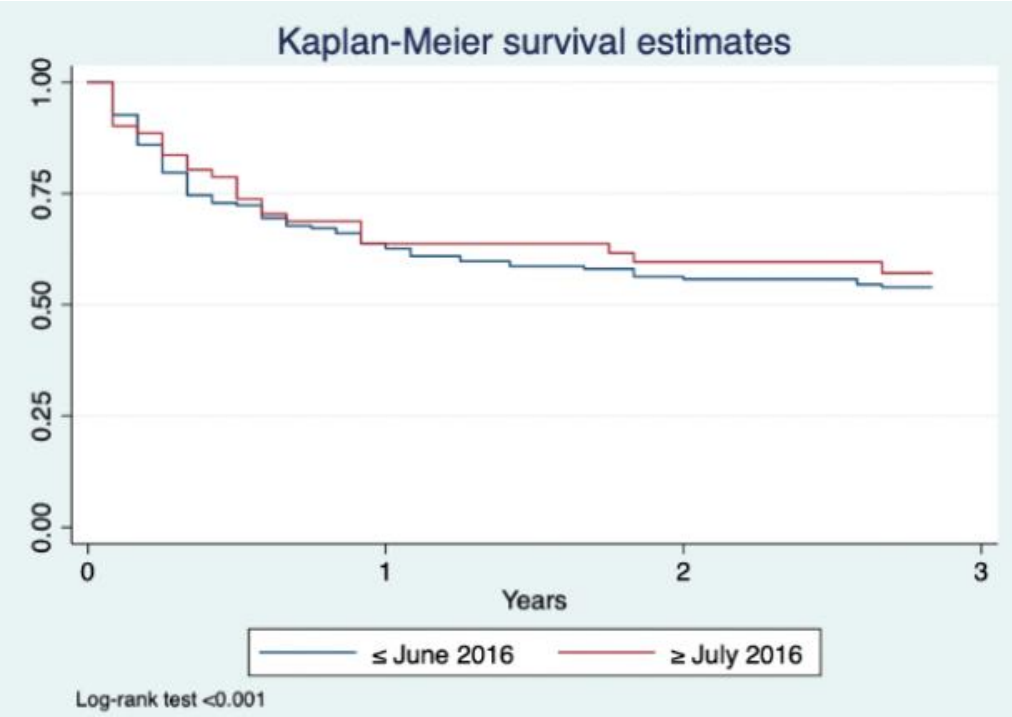
Objective: To describe the need for transfusion among non-isogroup Allo-HSCT during the first 100 days post-HSCT. To compare the overall survival (OS) of transplants with ABO incompatibility from the historical cohort versus those that received a differentiated intervention.

Methods: Retrospective analysis of transfusion support in patients undergoing non-isogroup Allo-HSCT between July 2016 and May 2021. All patients received packed red blood cells (CH) and platelets (PLT) that were deleucocyted and irradiated with 25 Gy, wtargeting hemoglobin ≥7 g/dl and PLT ≥20,000/mL. Bone marrow graft manipulation with reduction of red blood cells in major incompatibility, plasma depletion in minor, or both in case of bidirectional, was routinely performed. In the presence of incompatibility, the identification of isoagglutinin titers of IgM and IgG type (anti-A and/or Anti-B) has been carried out. IgG detection was realized with DTT treatment (dithiothreitol). In the presence of titles, a differentiated intervention was implemented, which consisted of selection of each blood component administered, through the performance of antibody titers (anti-A and/or Anti-B), as well as their follow-up. The significance level was $p < 0.05\%$.

Results: Non-isogroup Alo-HSCT (n=68) were classified into major (n=37), minor (n=26) and bidirectional (n=5) ABO incompatibility. There was no significant difference in the median of CH and platelet transfusions up to D+100 between the mismatch groups. Ten cases of neutrophilic graft failure were identified. All required transfusion support: median CH 6U (IQR 2-10) and median PLT 18U (IQR 5-26), however, there was no statistically significant difference when compared with the patients who underwent grafting. Regarding the OS of transplants with ABO incompatibility that received differentiated intervention (n=68) vs the other non-isogroup transplants of the historical cohort (n=127), there was a statistically significant difference (p=<0.001) in favor of the group that received the intervention.

Conclusions: In the presence of major and bidirectional ABO incompatibility, there was a greater need for red blood cell transfusions when compared with minor, although without statistically significant difference. In patients with ABO incompatibility, OS was higher after starting the differentiated intervention, suggesting the benefit of implementing personalized transfusion medicine programs within HSCT and immunohematology units.

FIGURE 1: Overall survival (OS) among Alo-HSCT with ABO incompatibility from the subgroup (n=68) and other incompatibles from the historical cohort (n=127)



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CHALLENGES DURING QUALIFICATION AND VALIDATION OF PROGRAMMED DECAY CURVES IN A CELL THERAPY CENTER

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Introduction: One of the challenges of a Cell Therapy Center (CTC) is the qualification and validation of programmed temperature decay curves, a fundamental process to ensure the viability and potency of cells undergoing cryopreservation. The challenge becomes even greater, according to the variety of cell types, equipment available, composition of the cryoprotective solution, cooling rate, time and place of storage, in addition to the costs involved. Different cell types, as well as cryopreservation in bags or vials, require differentiated freezing curves. To achieve this phase, the engagement of CTC professionals and a strong qualification of the selected equipment is fundamental.

Objective: To briefly summarize the variables that influence in determination of what freezing curve to use, according to the experience of a CTC and literature findings.

Methodology: Cell size, membrane permeability and osmotic limit are variables that influence the freezing of different cell types. The following are factors to be considered in choosing the ideal cryopreservation curve:

• Freezing Speed: To confer homogeneity in freezing, it must be gradual and constant, ensuring time for water to leave the interior of the cells by the difference of concentration gradient.

The beginning of crystallization in a controlled manner near the melting point is a determining factor to avoid freeze-related damage.

The conventionally used rate is 1 to 2 degrees per minute until -40ºC and 3 to 5 degrees per minute until -120ºC.

• Cell concentration: Currently studies show that high cell concentrations are well tolerated and confer good clinical results.

If in the past concentrations did not exceed 20 million cells per ml, currently reports of concentrations up to 300 million per ml are described. The range should be widely validated, as higher cellular concentration leads to higher intracellular ice formation.

• Cell volume: The final volume has been shown to have a significant impact on freezing kinetics. Bags when compared to vials, demonstrate better results of viability and potency due to the unequal speed of freezing in the transition phase, by the difference between volumes.

Results: To define the programmed decay curve in the CTC we used as inclusion criteria scientific articles, technical visits, validations and previous experience.

Conclusions: The choice of the ideal curve can affect the quality and potency of cryopreserved cells, influencing the success of hematopoietic recovery of patients undergoing Transplantation.

FACT recommends that we have validated procedures and a stability plan that periodically assesses the quality of products.

COLONY-FORMING UNITS AND CD34+ CELLS AS PREDICTORS OF THE QUALITY OF CRYOPRESERVED HEMATOPOIETIC STEM CELLS FOR TRANSPLANTATION

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Introduction: Cryopreservation is routinely used to maintain the viability and proliferative capacity of hematopoietic stem cells (HSC) after collection until the transplantation.The quality of cryopreserved HSC can be evaluated considering different parameters, such as: quantification of total nucleated cells (TNC), CD34+ cells, cell viability, as well as hematopoietic colony forming units (CFU). The quantification of CD34+ cells estimates the number of HSC present in the graft, while CFU evaluates the proliferative potential and the functional capacity of the cells. Total nucleated cells, CD34+ and viability are used as quality control of HSC for transplantation; on the other hand, quantification of CFU is not always used because, despite being a test of cellular functionality, it is difficult to standardize, is laborious and costly.

Objective: The objective of this work was to evaluate the correlation between the cell quality parameters most used in the HSC transplant routine with the functional assay of CFU in cryopreserved cells.

Materials and methods: Twenty three units of mobilized peripheral blood stem cell collected by apheresis, cryopreserved and stored in a mechanical freezer at -80 °C were evaluated. The TNC count was performed in a hematological counter. Quantification of cell viability (7-AAD) and viable CD34+ cells were performed by flow cytometry according to the ISHAGE protocol. The CFU assay consisted of cultivating nucleated cells on plates containing semi-solid methylcellulose medium and incubating them for a period of 14-16 days in a humidified incubator at 37 °C and 5% CO2. After this incubation time, the CFU were quantified in an inverted optical microscope. The correlation between the values of the evaluated parameters was calculated using the Spearman rank coefficient.

Results: The data showed that there is a strong correlation between the number of viable CD34+ cells and the number of total CFU (white and red series) ($rs = 0.899$; $p < 0.001$) and the number of CFU-GM (granulocyte and macrophages forming units) ($rs = 0.856$; $p < 0.001$). Total CFU showed moderate correlation with total TNC ($rs = 0.452$; $p = 0.031$), however, CFU-GM did not correlate with this parameter. No correlation was observed between cell viability with total CFU or CFU-GM.

Conclusion: The CFU assay on the material to be infused is the test that certifies the amount of functional and proliferative cells, which are responsible for the patient's hematopoietic reconstitution. However, it is not a widely used test due to difficulties related to the technique. The strong correlation observed between the number of viable CD34+ cells and the number of total CFU and CFU-GM demonstrates interdependence between these parameters, corroborating the use of the quantification of viable CD34+ cells as predictor of graft quality and engraftment efficiency.

Keywords: Hematopoietic stem cells. Peripheral blood stem cells. Cryopreservation. CFU. Hematopoietic colony forming units. CD34+ cells.

COMPARISON OF TOTAL NUCLEATED CELL RECOVERY BETWEEN TWO METHODS OF RED BLOOD CELL REMOVAL IN BONE MARROW

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Introduction: Bone marrow transplantation is a treatment that offers potential cure for various hematological diseases. Allogeneic transplants can lead to complications for the patient depending on the donor compatibility, including the risk of rejection, delayed or incomplete graft development, and graft-versus-host disease (GVHD). The method of erythrocyte depletion aims to reduce the risk of reaction during infusion and ensure the quality of the cellular product without significant loss in the final cell count.

Objective: To compare the recovery of total nucleated cells (TNC) between two distinct erythrocyte depletion methodologies performed on bone marrow.

Method: Retrospective analysis of 137 bone marrow processings using data collected between 2012 and 2022. The processes were divided into two groups: until 2017 without correction of the globular volume of the product, with a sedimentation period of 60 minutes, and the second group, from 2018 onwards, incorporated globular volume correction and a sedimentation period of 90 minutes. The D'Agostino & Pearson test was used to assess normality, and since it was not proven, the non-parametric Mann-Whitney test was employed to evaluate the differences in the percentage of TNC recovery. Statistical analyses were performed using R (RStudio, 2022) and GRAPHPAD PRISM, with a significance level of 5% ($\alpha = 0.05$).

Results: No significant differences were observed in the recovery of total nucleated cells between the two erythrocyte depletion methodologies. Additionally, a low variation was observed with coefficients of 10.4 for the period prior to 2017 and 9.6% post-2017, indicating that both methodologies were effective in preserving cells after processing.

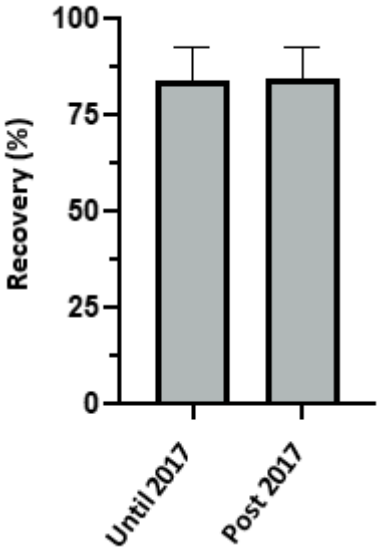
Conclusion: After the change in methodology, there was no negative impact on the quality of the provided service. Despite the increase in sedimentation time, based on years of practice, it was observed that there was no need for reprocessing of BM-HPC in many cases, which used to be a common practice when the sedimentation time was shorter. This demonstrates the adaptability of the Cellular Processing Center in seeking more efficient processes, providing greater confidence in the quality of the products available for transplantation.

Keywords: Bone marrow transplantation. Red blood cell reduction. Sedimentation

TABLE 1 – Standard deviation and median of CNT recovery in 137 processes performed from 2012 to 2022.

Period	No	Average ± Standard deviation	median (Minimum maximum)	P
Until 2017	55	84.0 ± 8.8	84.5 (64.4 - 99)	0.737
Post 2017	82	84.4 ± 8.1	85.6 (62 - 98.9)	

FIGURE 1- Mean values and standard deviation of CNT recovery in 137 processes carried out from 2012 to 2022



CONCEPTS AND CHALLENGES IN CHIMERIC ANTIGEN RECEPTOR T-CELL MANUFACTURING

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The manufacturing of chimeric antigen receptor T-cells (CAR-T) involves unique concepts and challenges that are crucial for the successful development and application of these innovative therapies in the treatment of Acute Lymphoblastic Leukemia, Lymphoma, and Multiple Myeloma, which are the target diseases of CAR-T.Standardization and quality control play a vital role in ensuring the effectiveness and safety of CAR-T products. From the collection of patient T-cells to their reinfusion, each step of the process requires standardized procedures and rigorous quality testing to guarantee consistent results. One of the technical challenges is the efficient selection and isolation of autologous T-cells from the patient. Obtaining an adequate quantity of viable and functional T-cells is crucial for treatment success. Additionally, the genetic modification of T-cells using viral vectors introduces complexity and additional risks to the manufacturing process.Another challenge lies in large-scale cell expansion. With the increasing demand for CAR-T therapies, there is a need to efficiently and consistently expand and cultivate large volumes of T-cells. Improvements in cell culture systems are essential to meet this growing demand. Logistics play a critical role in CAR-T manufacturing. Safe transportation and proper storage of modified T-cells are essential to maintain their viability and therapeutic activity. The supply chain needs careful planning and monitoring to ensure the integrity of T-cells until they reach the patients.Regulatory compliance is another crucial aspect of CAR-T manufacturing. Manufacturers must comply with strict Good Manufacturing Practice (GMP) requirements and provide solid evidence of the quality, efficacy, and safety of CAR-T products.Despite the challenges, significant advances have been made in CAR-T manufacturing. Improvements in cell culture technology, enhanced viral vectors, and innovative approaches to cell selection and expansion are driving progress in this field.In conclusion, CAR-T manufacturing involves complex concepts and challenges, ranging from standardization and quality control to scalability, logistics, and regulatory compliance. Ongoing investments in research and development are critical to overcome these challenges and maximize the potential of CAR-T therapies in the treatment of Acute Lymphoblastic Leukemia, Lymphoma, and Multiple Myeloma, ultimately benefiting the health and well-being of patients.

Keywords: Hematologic malignancies. CAR T. Cell therapy.

EFFECT OF BONE MARROW HEMATOPOIETIC PROGENITOR CELLS CRYOPRESERVATION ON TRANSPLANTATION OUTCOMES

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Introduction: Knowledge of cryopreservation of hematopoietic progenitor cells (HPC) collected by bone marrow aspiration (HPC,BM) is limited.

Aim: to describe the experience of a Cell Processing Center with HPC,BM cryopreservation for therapeutic use, and to compare the BMT outcomes with non-cryopreserved historical controls.

Methods: This is a nested case-control study. The casuistry consisted of 16 HPC,BM units cryopreserved between 2020 and 2022. The HPC,BM units were red blood cells (RBC) depleted using hydroxyethyl starch (HES) 450/0.7, followed by centrifugation for volume reduction. The units were frozen in a mechanical freezer at -80°C after adding the cryopreservation solution (5%HES/5%DMSO) and stored in the LN2 vapor phase. Data from patients whose HPC,BM unit was RBC depleted and freshly infused were used as historical controls. The control for one case of cryopreserved HPC,BM for autologous transplantation was one cryopreserved HPC,PB. Controls were matched to cases by diagnosis.

Results: The mean age of the patients was 29.4±11.1 years (1–48). Nine (56.3%) patients were female. One (6.3%) unit was cryopreserved for autologous use and fifteen (93.8%) for unrelated allogeneic BMT. One (6.3%) patient had neuroblastoma, one (6.3%) SCID, one (6.3%) CML, three (18.8%) AML, one (6.3%) Griscelli syndrome, two (12.5%) Wiskott-Aldrich syndrome and four (25%) ALL. Twelve (75%) units were released for therapeutic use, of which ten (83.3%) already have grafting data available. The mean time to neutrophil and platelet engraftment was 16.8 and 18.4 days, respectively. One (11.1%) patient had graft failure. There was no difference in time to neutrophil and platelet engraftment between cases and controls. Related to adverse effects during infusion, the frequency of nausea and hemoglobinuria was higher in controls (40% vs 14.3%, respectively), while the frequency of hypertension was higher in cases (20% vs 57.1%, respectively), although not significant. The occurrence of fever was significantly higher in controls when compared to cases (60% vs 0%, p=0.045). Although not significant, pseudomembranous colitis (0% vs 25%, respectively) was more frequent in cases, while mucositis (50% vs 12.5%, respectively) was more frequent in controls. Acute GVHD was not observed in cases and controls during the observational period. Cox regression analysis adjusted for age, sex, transplant center, and infused CD34+ cell dose showed no significant difference in the occurrence of death or grafting failure between cases and controls.

Conclusion: In summary, our study indicates that HPC,BM cryopreservation was not associated with an increased occurrence of adverse effects during infusion, BMT complications, and graft failure or death. However, the low number of individuals may have resulted in a lack of statistical power to detect associations, especially for variables with missing observations.

Keywords: cryopreservation, bone marrow, bone marrow transplantation.

EFFECTIVE COMUNICATION BETWEEN BLOOD BANKS AND ASSISTANCE SERVICES FOR PATIENTS RECEIVING ANTI-CD38 MONOCLONAL ANTIBODY FOR THE TREATMENT OF MULTIPLE MYELOMA - A CASE REPORT

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Introduction: Therapy with anti-CD38 monoclonal antibodies has been shown to be highly effective in the treatment of multiple myeloma. However, there is a lack of preparation of care services regarding the introduction of pharmacotherapy in the treatment of patients, especially about the impact on the transfusion routine. Unintentional binding to erythrocytes leads to pan-agglutination during the human antiglobulin testing phase, making it difficult to exclude underlying alloantibodies and leading to delays in the care of compatible units for red blood cell transfusion, which requires hemotherapy services to innovate and establish testing processes and protocols to clarify interferences in routine pre-transfusion tests. The association of effective communication and techniques implemented on the bench improve safety and quality in patient care.

Objective: Describe the impact on transfusional routine of a patient with multiple myeloma using Daratumumab and highlights the importance of effective communication between health services.

Methods: Analysis of records from the immunohematology laboratory from a Blood Bank in 2021.

Case: 61-year-old-male, anemia by neoplastic diseases, Hb: 6,5 g/dL, requested 2 units of red blood cell concentrate at 1:30 a.m. Pre transfusions tests: antibody screen I: 2+/II: 3+/ cross-match: incompatible, without transfusional or drugs history that cause cross-reaction with screen cells. Panel of red blood cells was performed to identify antibodies that showed pan-agglutination, negative results in enzymatic tests and acid elution. The red cells were treated with 0,2 M DTT without confirmation the use of anti-CD38 therapy. The time between the request and delivery of blood components was 14 hours. The request was classified as routine, so, can be prepared in 24 hours. The confirmation the diagnostic of Multiple Myeloma and the use of Daratumumab was informed only two weeks later, in a new request of red blood cell concentrate. Other requests were prepared and delivered in an average time of 4 hours. That patient received 29 blood components from April 11ththrough August 17thof 2021.

Conclusion: The absence of information could cause complications to the patient. The patient did not have phenotyping prior to transfusion, that is a very important step for patients in chronic transfusion regimen, which would cause greater difficulty in finding units of compatible red blood cell concentrates, in the case of antibody development. In addition, it was not possible to perform erythrocyte phenotyping after transfusion, since it can result a double population of red blood cells in the test. The effective communication between the hospital and the blood bank in cases where the patient uses Anti-CD38 therapy is a very important step, because in this way, the hemotherapy service can perform the complementary tests more effectively, in addition, reducing the service time, the cost of unnecessary tests, contributing to patient safety.

Keywords: Pre-transfusion laboratory test. Anti-CD38. Interference.

FEASABILITY OF EXTRACTION OF CFU-F/ MULTIPOTENT MESENCHYMAL CELLS FROM BONE MARROW FILTERS

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Introduction: Multipotent Stromal Cells (MSC) were described more than 50 years ago by Friedstein, as plastic adherent cells, of clonal origin, from the non-hematopoietic fraction from vitro murine bone marrow cultures. Later works in murine and human cells demonstrated the ability of these cells to differentiate to multiple mesenchymal tissues, leading to a new frontier in cell biology and therapy. Today, MSC are found in different tissues, such as adipose tissue, milk tooth pulp, umbilical cord segment, among others.

The actual bone marrow collection process for transplantation involves multiple aspirations of the medullary fraction of the bones, notably from the posterior iliac crests, targeting volumes related to the patient's weight and limited by the donor's weight. These aspirates are rich in bone spicules, where histologically we find sites of hematopoietic and stromal development. The spicules are filtered in closed systems, leading to a medulla capable of venous infusion. Filters are normally discarded items of the process.

Objective: The aim of this study is to establish the possibility of establishing CFU-F colonies from residual spicules from the normal process of bone marrow collection for donation.

Methods: Briefly, after each bone marrow collection, the filters were kept closed and sent to the processing laboratory. Each filter system was then mounted in a closed system, initially washed with 500mL of saline solution or isotonic glucose saline, defining the first fraction: washed. Afterwards, each system was treated with 0.125% trypsin in PBS for 2 hours at 37°C. Filters treated were then washed with another 400mL of saline solution containing 5% fetal bovine serum, defining the spike fraction. Each fraction was washed, resuspended in DMEM medium containing fetal bovine serum or human plasma from umbilical cord blood. CFU-F assay was performed in 6 or 24 well plates, with plating density from 1 to 5 x 105 CNT/cm2. Cells were cultured for 14 days, with a medium change in 7 days, after which they were washed, fixed with 70 GL alcohol and stained. Colonies were enumerated per plate and results normalized to CFU-F/106 cells. Comparison was made on the frequency of CFU-F in washings, spicules and occasionally in MO aspirate. The Prisma software was used and evaluated in parametric tests (ANOVA) with a significant difference when $P<0.05$.

Results: Washing of the residual filters identified an extraction of 19x108 total nucleated cells, while the spikes a value of 6.7x108 ($p=0.0474$). The mean amount of CFU-F in the wash was 29.4 CFU-F/106 CNT, but 138 for the cells obtained from the spikes ($P<0.0001$).

Conclusion: residual spicules from marrow filters are significant sources of CFU-F. Further studies will be devoted to the characterization of proliferation, expansion and differentiation.

IMPLEMENTATION OF CLINICAL PATHWAYS FOR CAR-T CELL THERAPY IN A BRAZILIAN PRIVATE HEALTHCARE ORGANIZATION

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Introduction: the treatment with CAR-T cells in Brazil is challenging because it requires a highly qualified multidisciplinary team trained in new clinical pathways to take care of these patients.

Objective: to describe the implementation of the clinical pathways for CAR-T cell therapy, ensuring safety and quality.

Method: this is an experience report study, performed in four private general hospitals of the Americas from São Paulo, Rio de Janeiro and Ceará states, during the year of 2022. The process of implementing the CAR-T Cell clinical pathway included: creation of a medical committee with the main medical references and specialist nurses from each center, for the elaboration of the main clinical protocols and operational procedures, in addition to the discussion of eligibility cases for therapy with CAR-T Cells. Identification of the multidisciplinary reference team in all phases of treatment, training the team involved in the clinical care of the patient, and finally, establishment of patient clinical pathway before, during and after the CAR-T cell therapy. The implementation process lasted seven months between the qualification of centers by the Therapy provider, internal qualification each center and the first cell infusion with CAR-T Cell performed.

Results: In all hospitals, professionals from the multidisciplinary team (pharmacy, nursing, physicians – hematologists, pediatric hematology-oncologists involved in hematopoietic stem cell transplantation, neurologists, pediatric and adult intensive care physicians) were trained. The Multidisciplinary Care Protocol was elaborated including indications, early and late complications. The Standard Operating Procedures addressed the pre and post infusion care, daily screening, criteria to transfer the patients to the intensive care unit, recognition and management of cytokine release syndrome and neurological toxicities. The main challenges of this process were to create the routines for evaluation and systematic monitoring and to identify and involve the multidisciplinary professionals directly involved in patient care.

Conclusions: the implementation of the program brought improvements to the clinical pathway, positively impacting professional satisfaction, the quality and safety of the patients. The CAR-T cell therapy was performed in a safe and integrated environment, uneventful and successful.

PRIVATE HOSPITAL EXPERIENCE DURING QUALIFICATION FOR TRANSFER OF TECHNOLOGY FROM THE PHARMACEUTICAL INDUSTRY TO CAR-T CELLS PRODUCTING

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Opening: With implementation of new ANVISA resolutions about the registration of Products of Advanced Therapy (PAT) as "Special Drugs", a period has started for Cell Processing Centers (CPC), prevailing the need to adjust the routine, encompassing an industrial vision, a production chain.

CPCs became a fundamental part of the production process, this way, the study sponsor is responsible for qualifying and providing ongoing oversight of the process, through training, meetings and audits to verify items such as: documents control, deviations, qualification and validations, equipment maintenance, and chain of custody; being essential minimum quality requirements, in terms of infrastructure, resources and technical skills, to be part of the products manufacturing chain.

Our service invested time and resources in becoming a last generation's center, with highly qualified professional, which guarantees the production of high quality and safe CAR-T, and the partnership with the pharmaceutical industry was fundamental for the transfer of knowledge.

Objective: The objective of this study was to report the quality aggregation in our CPC, after the transfer of technology from the pharmaceutical industries, to the CAR-T production process.

Methodology: The training and implementation of quality processes were evaluated, from the second half of 2020 until the present.

Results: Over 2 years of collaboration, we have highlighted the importance of training and logistics processes, using water or material obtained from the leukorreduction chamber, as a product of assays.

Trough processing and freezing, following the specific work sheet, with the simulation of weighing, centrifugation and concentration calculations, provided by sponsor, was noticed adaptations, team retraining and process improvements.

When sending the nitrogen container, containing a bag of water, failures in the logistics were found, and there was a need for improvement in the international receipt of PAT's. Adjustments made, ensured the shipment of the final product, with greater reliability.

The results of partnership between our center and sponsoring industries, provided the production of CAR-T on a large scale, allowing more patients to have access to this treatment. In addition, the hospital has become a reference in in the processing and freezing of cells to send to the manufacturing center and the receipt of the finished product, and infusion in patients of the institution and sending to the other centers in the country.

Conclusion: Measures such as the implementation of process, updating of specific indicators, periodic audits and discussions of the chain of custody, led to the improvement of the department's quality program, evidencing the success in the partnership between the niches, bringing innovative solutions in health and enabling the patient access to advances and effective therapies.

RELATIONSHIP BETWEEN STORAGE TIME AND TEMPERATURE ON THE VIABILITY OF CD34+ IN CRYOPRESERVED HEMATOPOETIC STEM/ PROGENITOR CELLS

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Introduction: The cryopreservation of hematopoietic progenitor cells-apheresis (HPC-A) is a crucial step in preserving cell viability for transplantation. Depending on the therapeutic strategy, storage can last from months to years until cell infusion. Quantification of CD34+ viability is a parameter used to assess the quality of the stored product and is one of the factors that can contribute to the success of a transplant.

Objective: To evaluate the relationship between the impact of storage time, temperature, and equipment for cryopreserved HPC-A on the viability of CD34+ as a marker of product quality for therapeutic use.

Method: Retrospective analysis of HPC-A products cryopreserved using a gradual freezing system between the years 2019 and 2022. The time considered ranged from the day of product collection to the day of transplantation. A total of 177 aliquots of HPC-A were used for CD34+ viability assessment. These aliquots were stored in the same equipment as the original cells and were thawed up to seven days before transplantation. The storage equipment used included an Ultrafreezer (≤ -80ºC) and a nitrogen gas phase tank (≤ -180ºC). Spemann's test and the non-parametric Mann-Whitney test were used to evaluate cell viability recovery with respect to storage time and equipment. Additionally, the Stepwise process was employed to simultaneously correlate the factors. Statistical analyses were conducted using R (RStudio, 2022) and GRAPHPAD PRISM, with a significance level of 5% ($\alpha = 0.05$)

Results: Cell viability recovery showed low correlations with storage time, whether analyzed between the two equipment types or individually, and the results were not statistically significant (Table 1). However, a significant difference was observed in the results between viability and the storage equipment, with higher values in the nitrogen gas phase tank (Table 2, Figure 1). The Stepwise process, applied after linear regression, yielded an R2 value of 0.039, indicating that the equipment in question accounts for only 3.9% of the variation in cell viability recovery (Table 3)

Conclusion: Storage time did not significantly impact cell viability recovery results. The aliquots stored in the nitrogen gas phase tank exhibited a higher recovery rate compared to those stored in the Ultrafreezer, but with minimal influence on the final outcome. This suggests that both equipment types are effective in preserving the viability of CD34+ cells. Other factors can be investigated in the future to further improve an already refined technique

Keywords: CD34. Cell viability. Hematopoietic progenitor cells. Cryopreservation. HPC-A.

TABLE 1 - Spearman correlation coefficients and p values associated with the correlation between time (in days) and recovery (in %)

Equipment	r	p
N2 gas phase tank (n=58)	-0.04	0.759
Ultrafreezer (n=119)	-0.09	0.355
General (n=177)	-0.03	0.695

TABLE 2 – Sample size, mean values, standard deviation, median, minimum, maximum and p value of percentage recovery.

Method	No	Mean ± Standard Deviation	median (Minimum maximum)	P
N2 gas phase tank	48	98.6 ± 1.6	99.3 (92.9 - 100)	>0.001*
ultrafreezer	119	97.8 ± 1.9	98.6 (92.8 - 100)	

*0.05

FIGURE 2- Boxplot of viability recovery according to the type of equipment

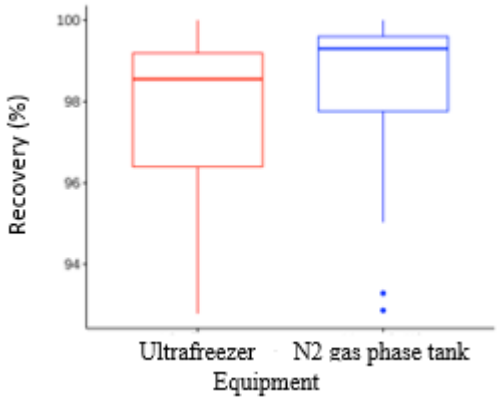

TABLE 3 - Results of multiple linear regression after Stepwise process

Coefficient	I estimated	Standard Error	p
intercept	97.7857	0.1652	<0.0001
Tank (N 2 gas phase)	0.7732	0.2886	<0.0001
Standard error of residue: 1.802			
Degrees of freedom: 175			
F statistic: 7.18			
p = 0.008			

REPORT ON SIMULATION OF RED CELL REDUCTION IN CELL THERAPY PRODUCTS WITH VOLUVEN® 6%

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Introduction: Due to the temporary discontinuation of manufacturing of hydroxyethyl starch (HES) 450/0.7-6% Plasmin® in Brazil, normally used in the red blood cell reduction (RBCR) procedure of cell therapy products with major incompatibility, the cell processing centers faced difficulties in obtaining alternatives for this procedure. Another recurrent limitation is the unavailability of cellular products to perform validations, without compromising transplant quality and patient safety. Therefore, to assess the RBCR procedure using HES 130/0.4 Voluven® 6%, a peripheral blood stem cell collection (PBSCC) was manipulated to obtain a product with higher initial hematocrit.

Objective: Evaluate the RBCR procedure with Voluven® 6%.

Method: To simulate the hematocrit (Ht) of a bone marrow collection, a red blood cell (RBC) concentrate bag of the same ABO/Rh typing was added to a PBSCC, both with authorization for disposal, obtaining a product with 694.4 ml and Ht of 30.2%. Voluven®6% was added to the bag in a proportion of 40% of the initial volume and kept under agitation for 30 minutes for homogenization. Afterwards, it was kept suspended overnight for decanting with a transfer bag attached for subsequent draining of the residue. Considering an average Ht of the residue of 80% and a target RBC volume (VRBC) in the final product of 19ml, the weight of the residue to be drained was calculated to be 255g.

The slow drain was performed in two steps:

In step 1, half of the programmed weight was removed. After one more hour of decantation, the programmed weight was completely drained. The residue was homogenized and an aliquot was taken for cell count.

With the result, it was noted that the RBCR procedure objective was not achieved. So we proceed to step 2.

The calculations were remade using the actual Ht obtained in the residue of 62.7% and the new programmed weight was 325g. The complementary volume was drained then. The bags were disconnected, homogenized, and new aliquots were taken for cell count

Results: The initial product showed volume of 694.4ml, Ht: 30.2%, TNC: 606.84x10E8 and VRBC: 210ml. After step 1, the estimated values in the product discounting the waste values were: Volume: 734ml, TNC: 516x10E8, VRBC: 60.77ml, with cell recovery of 85.17% and VRBC reduction of 71.5%.

The final RBCR product had a volume of 668.2ml, Ht:6.2%, TNC:459.63x10E8, VRBC:41ml with cell recovery of 75.74% and reduction of the VRBC of 80.5%.

Conclusions: Although a larger sample size analysis is needed to confirm the loss rates found, in this case report, The Voluven®'s performance was satisfactory. Considering the cell loss inherent to the process and to have a safety margin, it is recommended that the collection target be larger and the donor stimulated. It is also recommended to perform plasmapheresis in the recipient, since the final RBC volume target of 19ml was not achieved.

Keywords: red blood cell reduction procedure, voluven, plasmin, BMT.

STRUCTURING A DONOR ADVOCATE PROGRAM FOR ALLOGENEIC BONE MARROW TRANSPLANTATION

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Introduction: For the success of allogeneic bone marrow transplantation, the correct selection of the donor, explanations of the process and clarify doubts that the donor may have are fundamental, thus avoiding the refusal or withdrawal of the donor during the process. The Donor Advocate (DA) acts to protect the donor. His role is to provide education, guidance, facilitate understanding, notice any coercion during the process and ensure that donor needs, concerns and rights are respected. DA must be a professional that knows about the donation and the transplant process, medical ethics and informed consent. It must be independent from the transplant team, so that support is free of conflict of interest. Quality Accreditation Organizations, as JCI (Joint Commission International) and FACT (Foundation for the Accreditation of Cellular Therapy), include DA in their standards, reinforcing the importance of the donor advocate role in the transplant process.

Objective: To structure a donor advocate program for bone marrow donors assessed at the institution.

Method: Donor Advocate activities were initiated by the medical team of the Hemotherapy Department of the hospital in 2009. The team operates independently of the transplant team, with different directors. However, a change in the organization chart of the institution led to the merging of the departments, exposing a weakness and a possible conflict of interest. In this way, a partnership was established with the solid organ transplant team of the hospital, that also shared the same need for structuring their DA program. The bone marrow donor team would be the donor advocate for solid organ living donor and vice versa. These teams act independently and have different directors. A multidisciplinary team (physicians, nurses and psychologists) held meetings, the donation processes of each program were explained, and a structured questionnaire was prepared to guide DA during the donor assessment. We evaluated the feasibility of implementing this strategy, which has the advantages of optimizing human resources.

Results: So far, two bone marrow donor's assessment have been carried out. Scheduling an extra assessment was not an impediment of the process, since telemedicine has been used. The initial evaluation with DA was satisfactory, donors demonstrated to understand the process and felt confident with the decision to donate.

Conclusions: The interaction with the solid organ transplant team added knowledge, making it possible to implement the DA program in bone marrow and solid organ transplantation with experienced professionals who identified the same needs for their donation candidates, with no additional costs and guaranteeing an evaluation free of conflict of interest. The program, in addition to meeting the requirements of the accreditation standards, provided additional support to the donation candidate, certifying their understanding of the process and clarifying possible doubts, so that they would feel more secure with their decision.

THE IMPACT OF G-CSF ON CAR-T THERAPY RECIPIENTS: A LITERATURE REVIEW

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Introduction: Chimeric antigen receptor T cell therapy (CAR-T) has emerged as an option for refractoriness and relapsed diseases such as acute lymphoblastic leukemia, lymphoma, and multiple myeloma. Immune-associated effects, cytokine release syndrome (CRS), and immune effector cell-associated neurotoxicity syndrome (ICANS) are the most common adverse events and tend to be life-threatening and mostly self-limited. Other toxicities of interest are cytopenias. Almost 70% of refractory/relapsed B cell malignancies CAR T responding patients experienced severe neutropenia. In patients treated with CAR-T cell therapy, G-CSF could be associated in vitro to increase the incidence, severity, and duration of CRS and ICANS. The outcomes of a prophylactic G-CSF approach compared to other strategies, such as administering G-CSF after CAR T to treat neutropenia, or avoidance of G-CSF altogether, are unknown.

Methods: We performed a systematic literature review conducted using MEDLINE (through PubMed). The objective was to identify records of studies published from inception up until 31 May 2023, reporting no eligibility criteria concerning study type, language, geography or time limits.

Results: The search identified 63 publications, of which 6 were selected for full-text review and were included in the final analysis. There are two studies each from the USA, France, and China. All studies presented retrospective analyses of real-world data. In terms of the severity of neutropenia these observational studies are conflicting about the role of G-CSF in preventing neutropenia, some of them found a faster recovery and a less severe neutropenia using a prophylactic approach. The incidence of febrile neutropenia seems the same when they compare those who use G-CSF with those who do not. All except one study have shown comparable grade 3 or more CRS and ICANS. Cao et al. demonstrate a higher incidence of CRS but not ICANS in patients who received early approach G-CSF. There's no evidence that G-CSF use interferes with response related outcomes or CAR-T cell expansion.

Conclusion: Routine G-CSF administration seems to be safe and does not interfere with response rates, overall survival, or progression-free survival. Considering outcomes related to neutropenia, the role of this growth factor in the decrease of infection risk and prevention of late neutropenia, it is not clear. More studies are necessary, especially prospective and randomized ones.

Keywords: CAR-T cell. G-CSF. Literature review.

UNRELATED DONOR HEMATOPOIETIC STEM CELL COLLECTIONS (HSCT) FOR THE BRAZILIAN REGISTRY – REDOME

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Introduction: Finding a matched donor for an unrelated stem cell transplant (HSCT) may be a major challenge for patients with malignant and non-malignant diseases. The logistic involved in all stages of this process are critical and require an experienced and engaged multidisciplinary team. It is essential to comply with the national laws and guidelines of the Registro de Doadores Voluntários de Medula Óssea (REDOME), always aiming at the safety of donors, recipients, and quality of hematopoietic stem cells (HSC) collected.

The objective of this study is to describe the experience collecting HSC and donor leukocytes (DLI) for the Redome.

Methods: This is a retrospective study of Cell Processing Laboratory data from specific forms of all volunteers who donated cells to patients transplanted in other transplant centers. The bone marrow (BM) was aspirated from the posterior iliac crest under general anesthesia in the operating room and a maximum of 20 ml/kg was collected from the donor. The peripheral stem cells (PBSC) and DLI were collected by apheresis through peripheral venous access using the COBE Spectra cell separator and, from 2016 on, the Spectra Optia® was used. The nucleated cell count was enumerated in a automatic hematological counter, CD34+ and CD3+ enumeration by flow cytometry, cell viability by trypan blue exclusion and sterility in a Bactec® system. The information about the collection was informed to REDOME and confidentiality was maintained at all times.

Results: From December 2005 to April 2023 a total of 184 products were collected from 174 donors: 5 underwent two PBSC collections to reach the targeted cellularity. 55% were female. Two donors donated marrow for transplantation and later donated DLI with intervals between collections of 3 and 35 months. Three donors collected PBSC and subsequent DLI at intervals of 4, 6 and 20 months. A total of 76 PBSC, 99 bone marrow grafts and 9 DLI and were collected. The microbiological quality control demonstrated that 9 out of 99 marrow grafts grew Staphylococcus sp and there was no contamination in other products.

The number of collections per year is shown in figure 1. The distribution of the collections by region is shown in figure 2; there were no solicitations from the northern region of the country. All DLIs were requested for the south and southeast regions. The international requests were for South America (3), North America (14) and European countries (12).

Conclusion: We observed a predominance of bone marrow collections, followed by PBSC. Most collections were sent to the south and northeast of the country and the international predominance was for the United States, followed by Europe. There were no reports of severe side effects of the cell collection, problems during transportation or graft failure.

Keywords: Unrelated donor, marrow, PBSC, donor leukocyte infusion, REDOME.

FIGURES 1: Distribution number of collections per year.

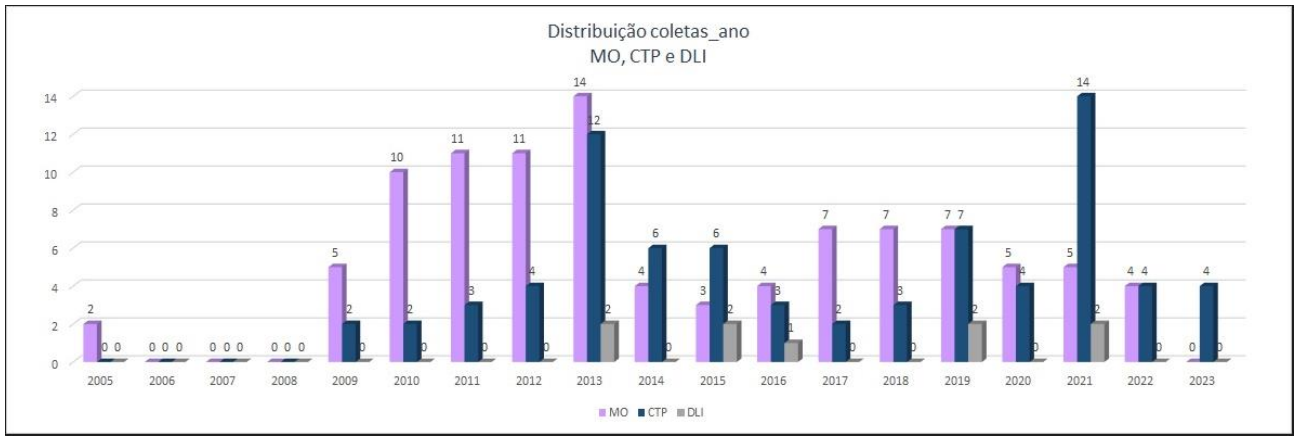

FIGURE 2. Distribution by regions of the country

TABLE 1. Data collected s - Median (variation)

Product	Lymphocytes %	Monocytes %	Granulocytes %	CD34 + %	CD3 %
Marrow	26 (17 - 45)	7 (4 - 20)	66 (31 - 78)	0,86 (0,35 - 1,93)	–
PBSC	38 (15 - 71)	10 (4 - 30)	51 (13 - 81)	0,70 (0,15 - 1,69)	–
DLI	53 (13 - 78)	16 (8 - 22)	25 (7 - 45)	–	48 (29 - 58)

USE OF CHEMOTHERAPY WITH AUTOLOGOUS CELL RESCUE IN PATIENTS WITH TRIPLE REFRACTORY RELAPSING MULTIPLE MYELOMA

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Introduction: Multiple myeloma (MM) accounts for about 10% of hematologic malignancies and 1% of all neoplasms[1]. When MM follows a relapsed/refractory (R/R) disease course, especially in triple-exposed patients, treatment options are limited. On the one hand, aggressive disease, common in triple refractory patients, requires rapid cytoreduction to control target organ damage, which is difficult to achieve with standard therapies. On the other hand, the use of intense chemotherapy for these patients is limited by high toxicity.

Objective: The objective of this study is to evaluate the response and toxicities in patients with MM R/R treated with high-intensity chemotherapy (mCBAD and VTDPACE) for cytoreduction associated with the rescue of autologous stem cells as a way of reducing toxicity, in a private institution in the Brazil, from January 2018 to May 2023.

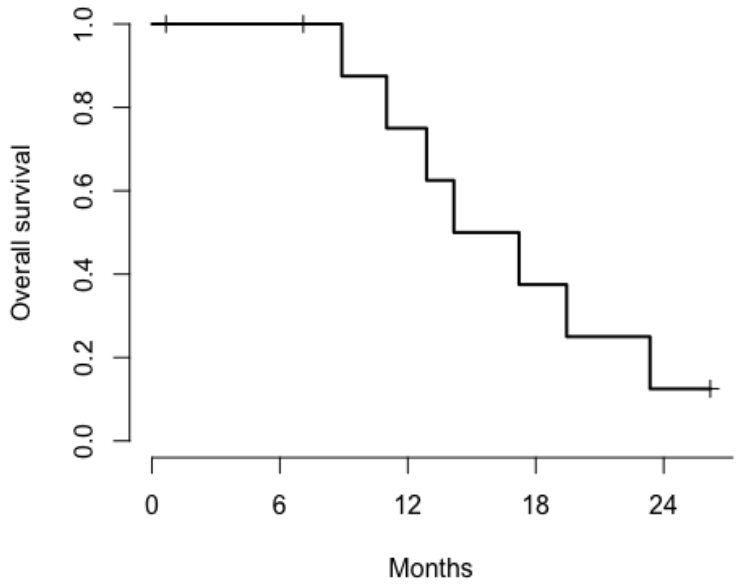
Methods: : This is a retrospective, unicentric and descriptive study. The response rate was evaluated after 28 days of each block of chemotherapy and was based on IMWG criteria.

Results: Data from 10 patients who received the treatment protocol were used, totaling 18 moments in the end (6 patients two infusions, 3 patients one infusion and 1 patient three infusions). The mean age of patients was 63.8 years and the median of previous treatments performed was 5.5 lines and all patients had disease progression. The chemotherapies used were mCBAD (8) and VDTPACE (2), the average infusion of infused CD34+ stem cells was 2.26x106/kg and the average time for neutrophilic recovery was 18 days from the beginning of treatment. chemotherapy. No patient had unacceptable toxicity and the major complication was febrile neutropenia, which occurred in 38% of cases. Two patients were on dialysis before starting the chemotherapy protocol and, after the treatment, they no longer needed this support. All patients showed response to the first cycle, with 73% showing partial response and 27% VGPR. The median follow-up time was 216 days. All patients received another treatment afterwards and because of this, it was not possible to evaluate the PFS directly associated with this treatment. The 1-year overall survival was 75%.

Conclusion: High-intensity chemotherapy with hematopoietic stem cell support offers good response rates even in extensively treated patients and has an acceptable safety profile. It is an effective scheme for rescue even in polytreated patients and should be used as a bridge to subsequent consolidation treatment, as it does not guarantee long-lasting PFS. Furthermore, in the Brazilian scenario where most patients do not have access to new medications, this strategy is shown to be a treatment option.

Key-Words: Multiple myeloma, High-risk MM, mCBAD, Relapsed/refractory MM

FIGURE 1. Overall 24-month survival of patients with MMRR who received treatment with a chemotherapy protocol followed by rescue with autologous cells.



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VALIDATION OF NITROGEN TANK FOR THE STORAGE OF CELLS TO BE USED IN CELL THERAPIES

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Introduction: Equipment intended for the storage of cells to be used in cellular therapies is considered critical and must be validated and monitored to ensure safety, quality, traceability, compliance with the good laboratory practices and the guidelines established by regulatory bodies. There are two models of nitrogen tank, one that keeps the liquid inside the tank in direct contact with the bags and another that keeps the liquid nitrogen between two walls, that is, the liquid is not in direct contact with the bags and the cells are in the nitrogen vapor phase (figure 1).

The objective of this study is to describe the process of validation of the vapor-phase nitrogen tank Custom Biogenic Systems® V 3000 series for storage of cells for cellular therapies according to Novartis® manufacturer's standard.

Methods: The first step was to perform thorough decontamination of the equipment with quaternary ammonia for hospital use. Three cylinders with 128 kg of liquid nitrogen were used for the first supply. The cylinders were adjusted to a pressure of 22 psi as recommended by the tank manufacturer and thus, did not cause damage to the solenoids. This tank model has the capacity to store 70 liters of nitrogen with evaporation of 9 liters per day. The storage capacity is 468 250 ml bags. The validation was performed in a storage room that has oximeters, exhaust system, external air replacement with G1 filter, audible and visual alarm to indicate oxygen saturation. The team used all PPE such as gloves, apron and cryogenic gaiters and face shield. The cylinder was connected for a first cooling that occurred with the tank cover open to prevent cracks in the tank. A standardized laboratory form was used to record the validation data (Figure 2).

Results: The validation was performed between October 26, 2022 and December 7, 2022. The first supply used two nitrogen cylinders. We observed that the beginning of the cooling occurred when the level was with 1.1 inches and –83°C and, at the end of the second cylinder, the tank was with 22 inches and temperature of –194°C. One cylinder was used only for the initial cooling without increasing the level of the liquid on the display. We found that, 24 hours after the end of the supply the tank was with 12.5 inches and -178°C, in 48 hours, 7.1 inches and -174°C, and 72 hours later, the display showed zero inches and the tank was –114°C. The supply and monitoring of the level decay was repeated four times.

Conclusion: The beginning of the cooling of the vapor phase tank is a step that requires care not to damage the equipment. Secure storage requires refueling on alternate days and the lack of supply after 96 hours compromises the safety of the stored bags. The parameter established in the tank programming was temperature from -196°C to -136°C and the nitrogen level from 7 to 21 inches.

Keywords: Equipments, Monitoring, Storage, Stem Cells, Cell Processing Laboratory.

FIGURE 1. **Models of nitrogen tanks**

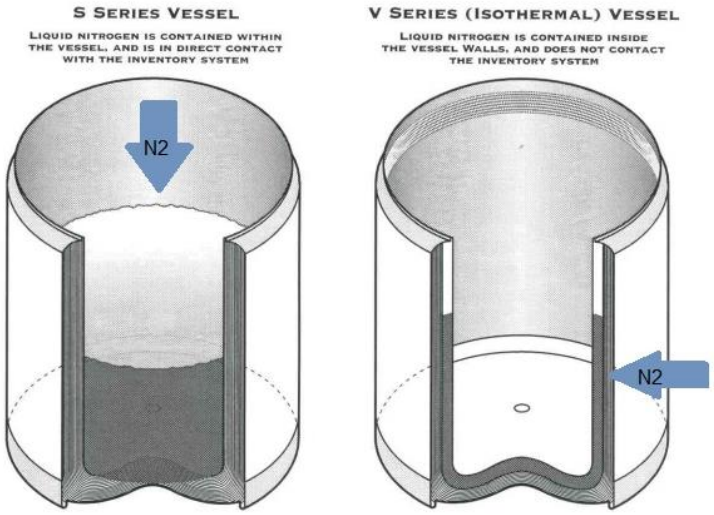

FIGURE 2. **Model of the level and temperature registration form.**

Date	Start	End	Display level	Display temperature	Observation

VALIDATION OF THE PRODUCTION PROCESS AND STORAGE OF AUTOLOGOUS SERUM EYE DROPS FOR THERAPEUTIC PURPOSES

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Introduction: Autologous serum eye drops (AS) are useful for the regeneration of damaged corneal cell epithelium and their use was approved by the Federal Council of Medicine in 2017. The Brazilian Health Regulatory Agency (ANVISA), through Technical Note 3/2018, established guidelines and determined that the production and storage of AS must be validated by each center in order to ensure the safety and quality of the product.

Objective: Establishing the resting time of collected whole blood, the rotation and the centrifugation time for AS production. Analyzing the storage stability at 4°C for 28 days and in the range of -30ºC to -15ºC (freezer) for up to 90 days.

Method: 9 BD Vacutainer® Dry 8ml tubes with separator gel and without anticoagulant were collected from ten voluntary donors. The tubes were homogenized and kept at rest in the vertical position for at least 60 minutes to promote coagulation and then centrifuged at 3000g for 15 min. Then, in a laminar flow hood, the tubes were visually inspected and the serum was carefully transferred to a sterile falcon tube. After homogenization, 5 ml was taken for quality controls (pH, microbiological control, albumin dosage, extracellular hemoglobin dosage, and residual cell count). The serum was bottled and stored as follows:

- 10mL in a sterile dropper bottle kept at 4ºC. One drop of serum was dispensed daily, and on days 7, 14, 21 and 28 the microbiological controls and albumin dosage were repeated.

- 2 eppendorfs with 1mL each were kept in the freezer, and the albumin dosage was repeated after 30 and 90 days. (Figure1)

Acceptance criteria included: i) physical: clot retraction, visible separation of the 3 layers post-centrifugation, clear serum without precipitates and absence of reddish coloration, ii) biochemical: extracellular hemoglobin ≤ 0.5 g/dL, residual WBCs: < 1.0x105/ml, residual RBCs: < 5.0x106/ml, residual platelets: < 50.0x106/ml, albumin dosage: no statistical difference in between the dependent samples iii) microbiological: after the storage period, negative microbiological control in 100% of cases. A descriptive analysis and T-dependent test were performed (SPSS 15 software).

Results: Adequate clot retraction was observed in all tubes. After centrifugation, serum separation was visible, and the mean volume obtained was 26 ml. 100% of the samples had no apparent precipitates, hemolysis or turbidity, and the mean residual hemoglobin count was 0.01g/dL, WBC 0.01x105/mL, RBC 0.085x106/mL and platelets 5.43x106/mL. The average albumin was 4.4g/dL and Ph: 7.59 (Table 1). Microbiological control was negative in 100% of the samples after processing and storage. There was no significant difference in albumin concentration after storage at 4ºC as well as in the freezer (Graph 1).

Conclusion: The AS showed characteristics within the stipulated acceptance criteria and product stability post-storage at 4°C for 28 days as well as in the freezer for up to 90 days, ensuring satisfactory quality for human clinical use.

Keywords: autologous serum eye drops; validation, GVHD

FIGURE 1: Process Flowchart

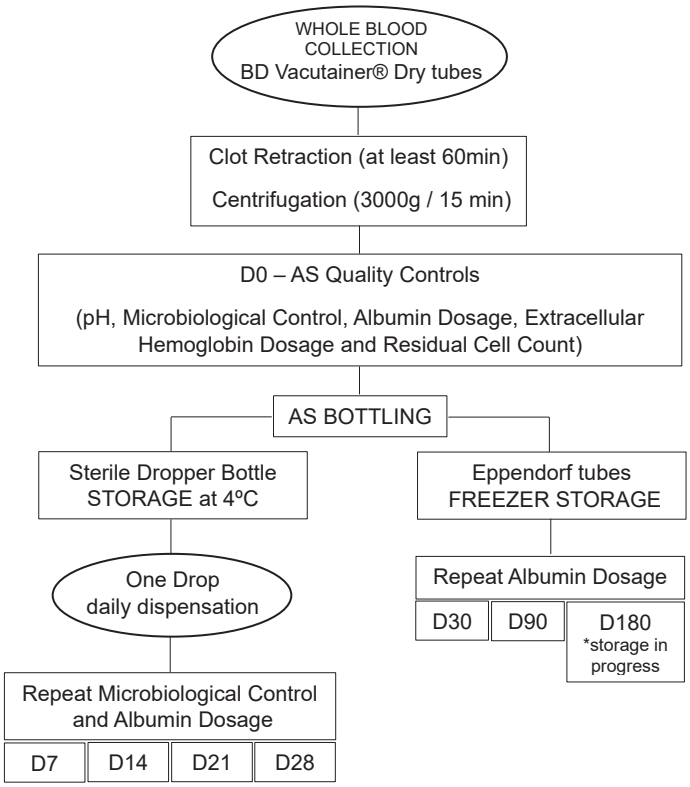

TABLE 1: Descriptive analysis of AS production and storage

Variables N=10	Mean (min – max)	Albumin Dosage (g/dL)	Mean (min – max)
Resting time (hours)	1:20 (1:00-1:50)	Day 0	4,4 (4,2-4,7)
Serum volume (mL)	26 (23-30)	Day 7	4,4 (4,3-4,7)
pH	7,59 (7,52 – 7,66)	Day 14	4,5 (4,3-4,8)
Extracellular hemoglobina (g/dL)	0,01 (0,001 – 0,037)	Day 21	4,5 (4,3-4,7)
Residual WBCs (x105/ml)	0,014 (0,001- 0,053)	Day 28	4,4 (4,2-4,7)
Residual RBCs (x106/ml)	0,085 (0,02 – 0,18)	Day 30	4,5 (4,3-4,8)
Residual platelets (x106/mL)	5,43 (1-12,80)	Day 90	4,5 (4,2-4,7)

GRAPH 1: Comparison of the average albumin concentration in stored serum during different times and conditions with the D0 dosage.