

THE ROLE OF A HEMATOLOGY OUTPATIENT CLINIC IN IMPROVING ACCESS TO BONE MARROW TRANSPLANTATION IN LOW-MIDDLE-INCOME COUNTRIES

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ABSTRACT

Discussing eligibility early in Bone Marrow Transplantation (BMT) reduces waiting time, donor search, and speeds up pre-transplant care access. The study describes optimizing access to BMT through an outpatient clinic for pre-transplant patient evaluation. Retrospective study, from 2021- 2023 at Walter Cantídio University Hospital. Data analyzed in SPSS shows 226 transplants out of 3646 consultations. The clinic referred 45 patients, contributing 19.1%, 11.7%, and 22.1% of transplants in 2021, 2022, and 2023, respectively, compared to <5% in previous years. This increase highlights the importance of expedited access to pre-transplant care, resulting in a greater number of patients eligible for transplantation.

Keywords: Bone marrow transplantation. Ambulatory Care.

INTRODUCTION

A very important aspect in carrying out a Bone Marrow Transplant (BMT) is the initial patient (?) assessment by a hematologist. In some pathologies, this discussion (the determination?) of eligibility must be considered during the first consultations and must be discussed with the patient and their family members¹. This consideration is crucial for reducing waiting times, searching for the ideal donor and arriving at the pre-transplant clinic. Aware of this issue, we decided to create a hematological outpatient clinic with a focus on comprehensive assessment prior to referral for pre-BMT care.

MATERIAL AND METHODS

This is a retrospective, observational study of hematology patients from the outpatient hematology service of Walter Cantídio University Hospital (HUWC). Clinical and hematological evaluations were conducted before referral to the pre-HSCT outpatient clinic, conducted from January 2021 to December 2023.

In addition to the comorbidity index (HCT CI)^{2,3}, we are also broad geriatric assessment criteria^{4,5} and, in some cases, the Next Generation Sequencing (NGS) as additional data for clinical decision-making. HDI

(Human Development Index) data for the municipalities of Ceará were obtained from the website of the Brazilian Institute of Geography and Statistics (IBGE)⁶. The distribution frequency was analyzed using the GraphPadPrism version 9.0 program. We consider $p < 0.05$ significant.

RESULTS

Since 2008, the HUWC BMT service has performed 808 transplants. From January 2021 to December 2023, the outpatient clinic conducted 3646 medical consultations for the HUWC BMT service. These consultations covered patients with various diagnostic possibilities including acute myeloid and lymphoid leukemias, lymphoproliferative diseases, plasma cell dyscrasias, and bone marrow failures, myelodysplasias, as well as new patients without defined diagnoses, and those coming from the HUWC hematology ward requiring chemotherapy monitoring. In total, 226 transplants were performed over the analyzed three-year period.

The Hematology Outpatient Clinic referred a total of 45 patients to the hematopoietic stem cell transplantation (HSCT) pre-transplant outpatient clinic. Of these, 41 (91.1%) underwent transplantation at the HUWC, while 4 (8.8%) patients did not undergo transplantation due to disease progression, becoming ineligible. In 2021, 13 transplants were performed, corresponding to 19.1% of the 68 performed in the current year. In 2022, due to the COVID-19 pandemic and the lack of chemotherapy drugs to perform transplants, 8 transplants were performed, representing 11.7% of the total of 68 transplants performed. In 2023, 20 transplants were performed, representing 22.1% of the 90 procedures carried out that year (Table 1). Before the implementation of this hematological outpatient clinic, the percentage of all transplants originating from this clinic was less than 5%.

Of the patients undergoing transplantation, 57.50% were male, and the average age was 43.12 ± 14.44 years. 27.5% received autologous transplantation, and 75.5% received allogeneic transplantation. Of these, 22.5% were from related, 25% were from unrelated, and 25% were from haploidentical donors.

The patients came from different municipalities in the state of Ceará, with the majority coming from Fortaleza (52.50%), which had the highest HDI (0.754). We observed that the lowest HDI was recorded in Mombaça (0.604), located 306 km from the hematology service. The average HDI of the patients' cities was 0.7098 ± 0.523 , and the average distance from the hematology service was $124.4 \text{ km} \pm 94.05 \text{ km}$. (Table 2).

It is relevant to highlight that the outpatient waiting list consists of 160 patients in the pre-transplant period, and due to the limited number of beds, some patients are unable to undergo transplantation within the ideal timeframe. We observed that around 20% of the patients we saw pre-term were considered ineligible. In our sample, 38.4% of patients with lymphoproliferative disease were ineligible patients due to advanced and chemoresistant disease, which increases the difficulty of accessing adequate treatment as an initial approach without complete remission, making transplantation an unfeasible alternative. This reality is also observed in patients with bone marrow aplasia who, after multiple transfusions, find themselves alloimmunized, with platelet refractoriness and often unable to proceed with transplantation. With the changes in the processes, we observed an increase in the rates of patients eligible for BMT.

DISCUSSION

Given these preliminary data from the last three years, we can observe that changing processes and greater knowledge of the strategic role of BMT can be very useful tools in the attempt to shorten the path between the hematology outpatient clinic and the pre-BMT outpatient clinic. This interaction can be very beneficial in shortening the time between diagnosis and BMT, which for some pathologies such as acute leukemias, myelodysplasias and bone marrow failures, it is crucial in the final outcome^{5,7}.

Greater awareness has emerged that age alone is not the sole defining factor for eligibility^{8,9}. Instead, it is an additional aspect that must be considered together with comorbidities⁷ and cognition¹⁰. This shift has changed the life stories of many previously ineligible patients.

Access to transplantation, as well as its results, depends on socioeconomic factors that may vary between and within countries¹¹. Studies in developing countries with high ethnic and demographic diversity have demonstrated an association between socioeconomic level and access to transplantation and mortality after transplantation. The HDI assesses longevity, knowledge, and standard of living, an HDI (<0.500) is considered a low development status, an HDI between (0.500 to 0.799) is considered intermediate and an HDI (>0.800) is considered high¹². In this study, we observed that the majority of patients who had access to HSCT at our service had an intermediate HDI. In the European multicenter study, high HDI was associated with greater relapse-free survival and reduced risk of relapse¹¹.

We must also consider the decision to contraindicate the HSCT procedure, which can make the path of palliative medicine a wise alternative. This approach may bring more peace, comfort and dignity to the patient and their family, particularly when all parties converge on the same decision⁴.

It is important to highlight the growth and importance of this action in our service. We currently have five assistant medical doctors on the team, and a multidisciplinary team that contributes significantly, strengthening our initial efforts.

Aware of the relevance and advances achieved through this initiative, we chose to share our experiences, with the purpose of highlighting that changing processes, especially in a public university service in a region with significant financial restrictions like ours, could serve as support to other centers in our country and in nations classified as low and middle income (LMIC).

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Competing Interests

The authors declare no competing interests.

TABLE 1: Patients from the pre-BMT outpatient clinic who underwent bone marrow transplantation between 2021 and 2023.

YEARS	NUMBER OF TRANSPLANTS PERFORMED PER YEAR	NUMBER OF PATIENTS REFERRED FOR PRE-BMT (%)
2021	68	13 (19,1%)
2022	68	8 (11,7%)
2023	90	20 (22,2%)
Total	226	41 (18,1%)

Note: BMT: Bone Marrow Transplantation; (%) = Percentage

TABLE 2: Origin, HDI and travel distance of patients treated at the outpatient clinic who were referred to pre-term care.

CITIES	NUMBER OF PATIENTS	HDI	DISTANCE (km)
Fortaleza	21	0,754	10
Itapipoca	2	0,64	146
Russas	2	0,674	168
Horizonte	1	0,679	46,5
Itaitinga	1	0,68	33,3
Limoeiro do Norte	1	0,682	198
Trairi	1	0,632	124
Redenção	1	0,651	62
Ibicuitinga	1	0,642	195
Eusebio	1	0,701	25
Independência	1	0,632	303
Mombaça	1	0,604	306
Sobral	1	0,714	240
Canindé	1	0,612	116
Maracanaú	1	0,736	19,6
São Gonçalo do Amarante	1	0,665	62,8
Palmácia	1	0,65	67,7
Mulungu	1	0,65	116

Note: HDI=Human development index; Km=kilometers.

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