Evaluation of Plerixafor in Autologous Hematopoietic Stem Cell Mobilization

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Introduction

- Autologous hematopoietic stem cell transplants are a common therapy used in the treatment of Non-Hodgkin lymphoma, Hodgkin lymphoma, multiple myeloma and other plasma cell disorders.
- Predisposed risk factors for poor mobilization with G-CSF alone include: prior chemotherapy, age or specific-disease characteristics.
- Plerixafor may reduce the total number of apheresis sessions required to reach recommended target CD34+ cell counts, which ultimately minimizes discomfort, pain, risk of complications and healthcare costs.
- The purpose of this study is to assess the average length of apheresis days using plerixafor to determine if a new standard of care change to novel agent motixafortide may be warranted.

Objectives

- **Primary objective:** median total number of apheresis days needed to reach patient-specific target CD34+ count
- **Secondary objectives:** number of apheresis days in correlation with previous treatment history, total CD34+ count collected per day of apheresis

Methods

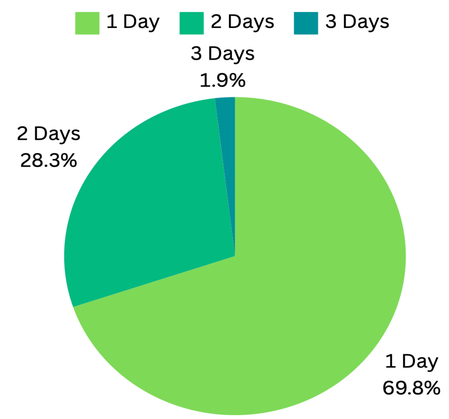
Design: Single-center, retrospective cohort study
Study period: October 1st, 2023 to September 30th, 2024
Study cohort: Patients ages 18-88 who received at least one dose of plerixafor for autologous hematopoietic stem cell mobilization
Statistical analysis: Descriptive statistics including means, interquartile ranges, and frequency

Table 1. Baseline Characteristics

Characteristic	N=53
Median age, *years* (range)	62 (27-78)
Male sex, *n* (%)	32 (60)
Baseline disease, *n* (%)	
Multiple myeloma/plasma cell disorders	40 (75)
Non-Hodgkin lymphoma	7 (13)
Hodgkin lymphoma	3 (6)
CNS lymphoma	2 (4)
Other	1 (2)
Median no. of induction cycles, *n* (range)	5 (1-17)
Lenalidomide-containing induction, *n* (%)	36 (68)
Anti-CD38 antibody-containing induction, *n* (%)	35 (66)
Previous radiotherapy, *n* (%)	6 (11)
Proceeded to transplant, *n* (%)	49 (92)

Results

Total Number of Apheresis Days Needed



- Among 53 patients, 37 (70%) patients required one day of apheresis.

Comparison of Induction Regimens

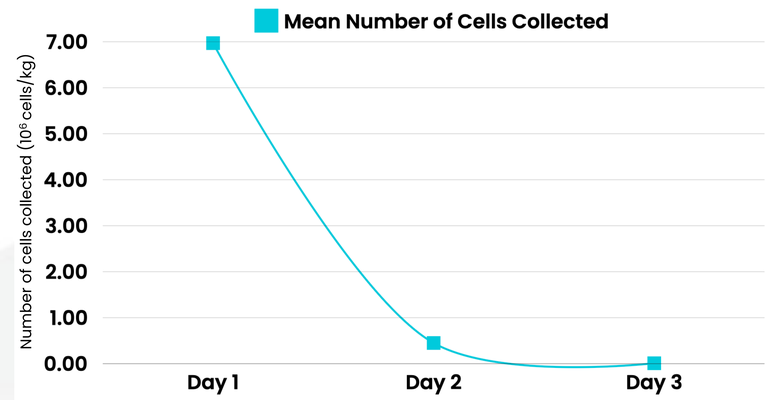
PREVIOUS ANTI - CD38 EXPOSURE n=35	NO PREVIOUS ANTI-CD38 EXPOSURE n=18	Outcome	PREVIOUS IMID EXPOSURE n=36	NO PREVIOUS IMID EXPOSURE n=17
66%	78%	Requiring 1 day of apheresis	67%	76%
31%	22%	Requiring 2 days of apheresis	31%	24%
63%	61%	Met patient specific goal	67%	53%
94%	89%	Proceeded to transplant	94%	88%

Table 2. Subgroup Analysis of Patients Requiring 2 or More Days of Apheresis

Risk Factor for Mobilization Failure	n=16
Median age, *years*	62
Baseline disease, *n* (%)	
Multiple myeloma/plasma cell disorders	13 (81)
Non-Hodgkin lymphoma	1 (7)
Hodgkin lymphoma	1 (7)
Lenalidomide-containing induction, *n* (%)	12 (75)
Anti-CD38 antibody-containing induction, *n* (%)	12 (75)
Previous radiotherapy, *n* (%)	4 (27)

- Among 16 patients who required more than 1 day of apheresis, the most common induction therapy regimen was D-VRD (n=8).
- The average days of anti-CD38 antibody therapy held before collection was 23 days and the average days of lenalidomide therapy held before collection was 29 days.

Mean Number of Cells Collected Per Day



- The mean total of cells collected on days 1, 2, 3 respectively were 6.67 (0.16-26.73), 0.45 (0-2.61), and 0.01 (0-0.45) x 10^6 cells/kg.

Conclusions

- The utilization of plerixafor in autologous stem cell mobilization is supported by evidence indicating that 70% of patients required only a single day of apheresis to achieve sufficient stem cell collection.
- Patients with previous anti-CD38 antibody and/or previous IMID exposure were more likely to require greater than one day of apheresis compared to those without, indicating that previous anti-CD38 antibody and/or previous IMID exposure may be a risk factor for poor mobilization.
- An additional risk factor for poor mobilization observed was having a previous history of radiotherapy, as majority of these patients required multiple apheresis days.
- Considering the significantly higher cost of motixafortide compared to plerixafor, this study supports the use of plerixafor front-line.
- Further studies are warranted to directly compare the efficacy of these agents to refine their optimal clinical application as well as identify additional risk factors for poor mobilizers to determine a place in therapy for motixafortide.

Disclosure/References

The authors of this study have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.

Dhakal B, Shah N, Kansagra A, et al. ASTCT Clinical Practice Recommendations for Transplantation and Cellular Therapies in Multiple Myeloma. Transplant Cell Ther. 2022;28(6):284-293. doi:10.1016/j.jtct.2022.03.019

G-CSF: granulocyte colony-stimulating factor
IMID: immunomodulatory drugs