A Retrospective Record Review of Mobilization Strategies with and without Plerixafor for Autologous Stem Cell Transplant in Patients with Multiple Myeloma

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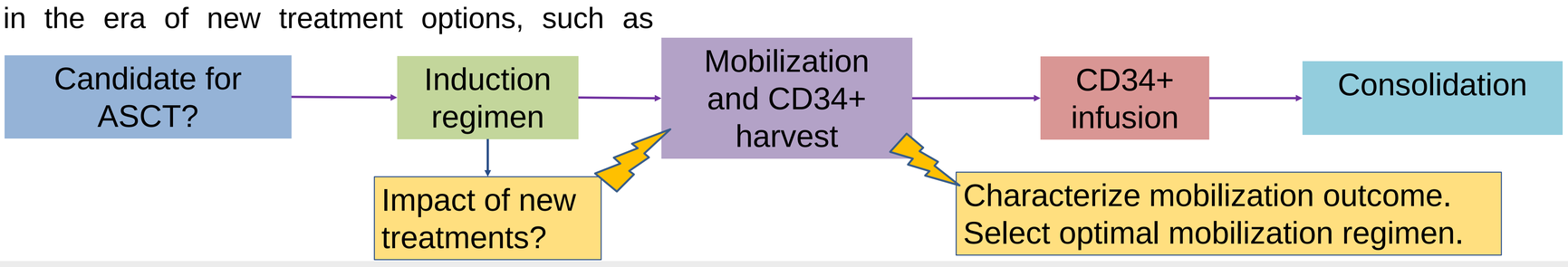
INTRODUCTION

- Autologous stem cell transplant (ASCT) is a standard of care in patients with multiple myeloma (MM) after receiving induction chemotherapy (Rajkumar & Kumar, 2020).
- Mobilization with granulocyte colony stimulating factor (G-CSF) with or without chemotherapy may lead to unpredictable harvest yields of peripheral blood stem cells (PBSCs, or CD34+ cells). This can lead to insufficient PBSC collection and potentially preclude plans for high-dose chemotherapy with autologous stem cell rescue (Bensinger et al, 2009).
- Plerixafor, a CXCR4 antagonist, in combination with G-CSF has been shown superior to G-CSF alone (Giralt et al, 2014).
- The objective of this study was to determine clinical outcomes of different mobilization regimens in the era of new treatment options, such as lenalidomide.

METHODS

- Retrospective, multi-center, chart-review study in patients with MM.
- 4 high-volume centers in the US between February 2018 and July 2020.
- Patients aged ≥18 years, diagnosed with MM and eligible for first ASCT.
- Patients were attributed to three treatment arms according to mobilization regimen:
  - G-CSF+plerixafor
  - G-CSF
  - G-CSF+chemomobilization
- Differences in mobilization and ASCT outcomes between regimens were analyzed.



RESULTS

Table 1: Patient Characteristics at Diagnosis

	G-CSF+plerixafor n = 310	G-CSF only n = 57	G-CSF+ chemotherapy n = 22
Gender, n (%)			
Female	133 (43)	21 (37)	9 (41)
Male	177 (57)	36 (63)	13 (59)
Age			
Mean (SD)	59 (8)	59 (9)	55 (10)
Disease stage at diagnosis, n (%)			
Stage I	54 (19)	15 (30)	4 (18)
Stage II	78 (27)	16 (32)	3 (14)
Stage III	155 (54)	19 (38)	15 (68)
unknown	23	7	0
Prior radiotherapy, n (%)			
yes	291 (94)	42 (74)	18 (82)
no	18 (6)	15 (26)	4 (18)
unknown	1	0	0
Cytogenetic risk factor, n (%)			
high risk	94 (32)	14 (26)	3 (14)
intermediate risk	7 (2)	6 (11)	0
standard risk	193 (66)	34 (63)	19 (86)
unknown	16	0 †	0

Table 2: Apheresis Characteristics

	G-CSF+ plerixafor n = 310	G-CSF only n = 57	G-CSF + chemotherapy n = 22
Sessions, n			
Median (Q1, Q3)	1.5 (1.0, 2.0)	2.0 (1.0, 2.0)	2.0 (1.0, 2.0)
p-value†	NA	0.25	0.56
Volume (l)			
Median (Q1, Q3)	24.8 (18.4, 42.2)	30.0 (26.0, 45.0)	27.0 (15.3, 30.5)
p-value†	NA	0.04	0.65

† Wilcoxon Rank Sum, comparison between G-CSF and G-CSF+plerixafor or G-CSF+chemotherapy and G-CSF+plerixafor

Figure 1: Apheresis Yield

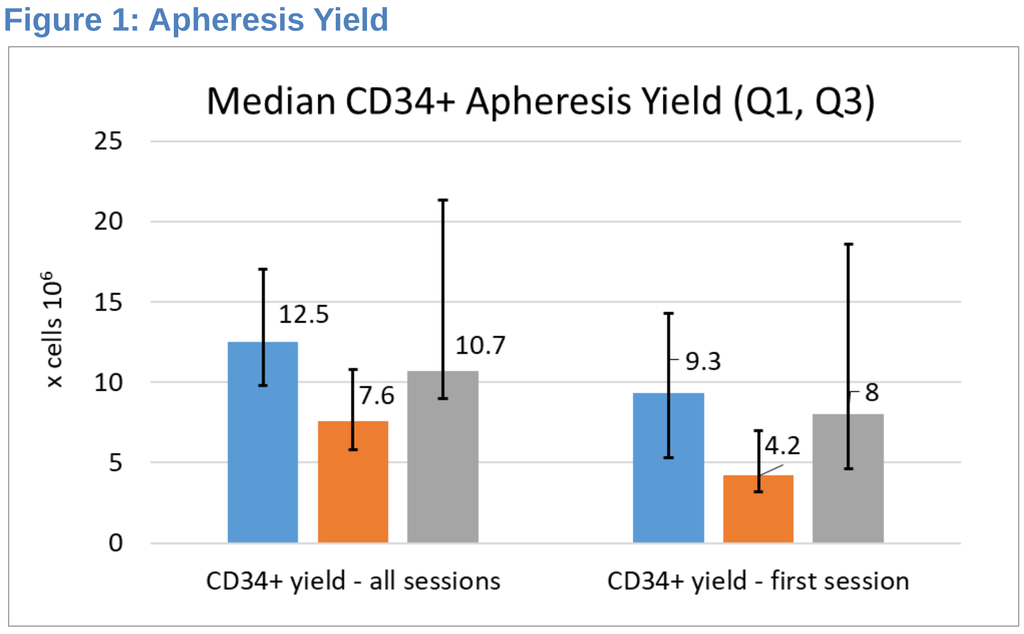
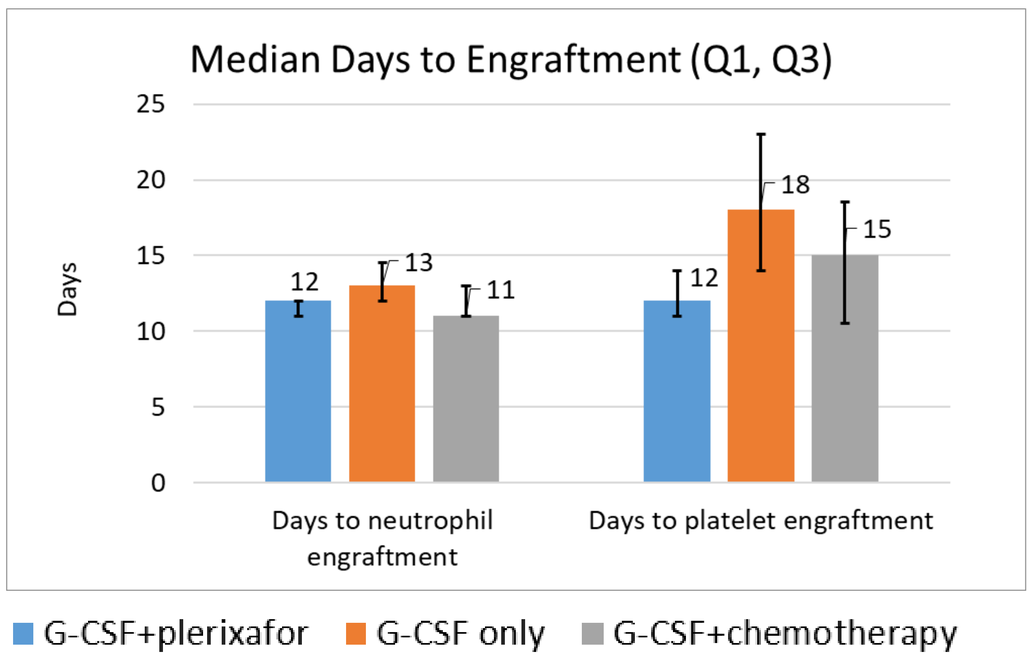


Figure 2: Transplantation Outcomes



Vertical black lines refer to 1st and 3rd quartiles (Q1, Q3)

CONCLUSIONS

- There was a trend to fewer apheresis sessions and lower processing volume with G-CSF+plerixafor vs G-CSF alone.
- Apheresis yields were higher in G-CSF+plerixafor vs G-CSF alone.
- Apheresis outcomes were similar between G-CSF+plerixafor vs G-CSF +chemotherapy.
- Whether higher CD34+ yields relate to CD34+ dose infused and faster engraftment deserves further attention.

REFERENCES

- Rajkumar, S.V., Kumar, S. Multiple myeloma current treatment algorithms. *Blood Cancer J.* 10, 94 (2020). https://doi.org/10.1038/s41408-020-00359-2.
- Bensinger, W., DiPersio, J. & McCarty, J. Improving stem cell mobilization strategies: future directions. *Bone Marrow Transplant* 43, 181–195 (2009). https://doi.org/10.1038/bmt.2008.410
- Giralt S, Costa L, Schriber J, et al. Optimizing autologous stem cell mobilization strategies to improve patient outcomes: consensus guidelines and recommendations. *Biol Blood Marrow Transplant.* 2014;20:295-308. doi: 10.1016/j.bbmt.2013.10.013.