

Plerixafor and Granulocyte Colony-Stimulating Factor for Poor Mobilizers in Patients Undergoing Autologous Peripheral Hematopoietic Stem Cell Transplant: Single Institution Study

Samantha El Warrak¹, Michael Anthony Timonian², Razan Mohty¹, Fatima Ismail³, Ammar Zahreddine⁴, Nabila Kreidieh⁴, Iman Abou Dalle⁴, Ali Bazarbachi⁴, Jean El Cheikh⁴

¹Division of Hematology/Oncology, Department of Internal Medicine, American University of Beirut Medical Center, Beirut, Lebanon

²Faculty of Medicine, American University of Beirut, Beirut, Lebanon

³Department of Pharmacy, American University of Beirut Medical Center, Beirut, Lebanon

⁴Bone Marrow Transplantation Program, Department of Internal Medicine, American University of Beirut Medical Center, Beirut, Lebanon



Background

- Autologous hematopoietic stem cell transplant (ASCT) has become the mainstay treatment for many hematological malignancies and solid tumors.
- An adequate number of stem cells must be collected for better ASCT outcomes, which is challenging in 5%–30% of patients.
- To improve mobilization, plerixafor is used, along with granulocyte colony-stimulating factor.

Objective

- To evaluate the real-life efficacy of plerixafor and to identify factors associated with poor mobilization.

Patients and methods

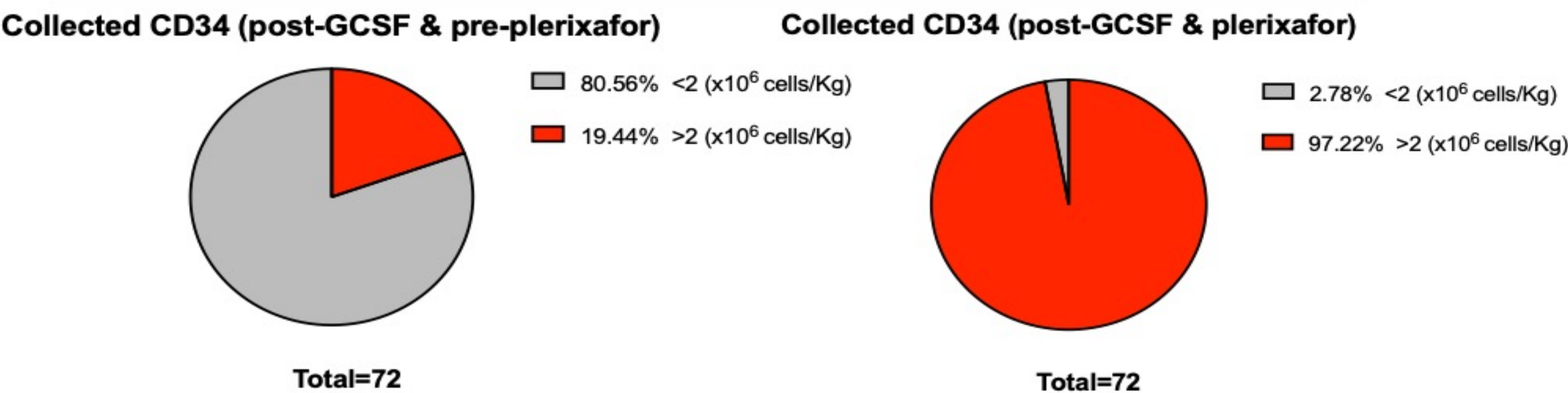
- This is a retrospective, single-center study involving patients who received plerixafor pre-ASCT between January 2013 and December 2020 at a tertiary care center in Lebanon.
- We identified a total of 72 consecutive adult patients. Patients who received plerixafor were divided into two groups: poor mobilizers with pre-emptive use before first apheresis for those with peripheral CD34+ stem cells (PSC) <20 cells/ μ L, or after failure of first apheresis in those with PSC >20 cells/ μ L.
- The main endpoints were to evaluate characteristics of poor mobilizers, stem cell yields pre- and post-plerixafor, as well as the time to neutrophil and platelet engraftment.

Results

Figure 1

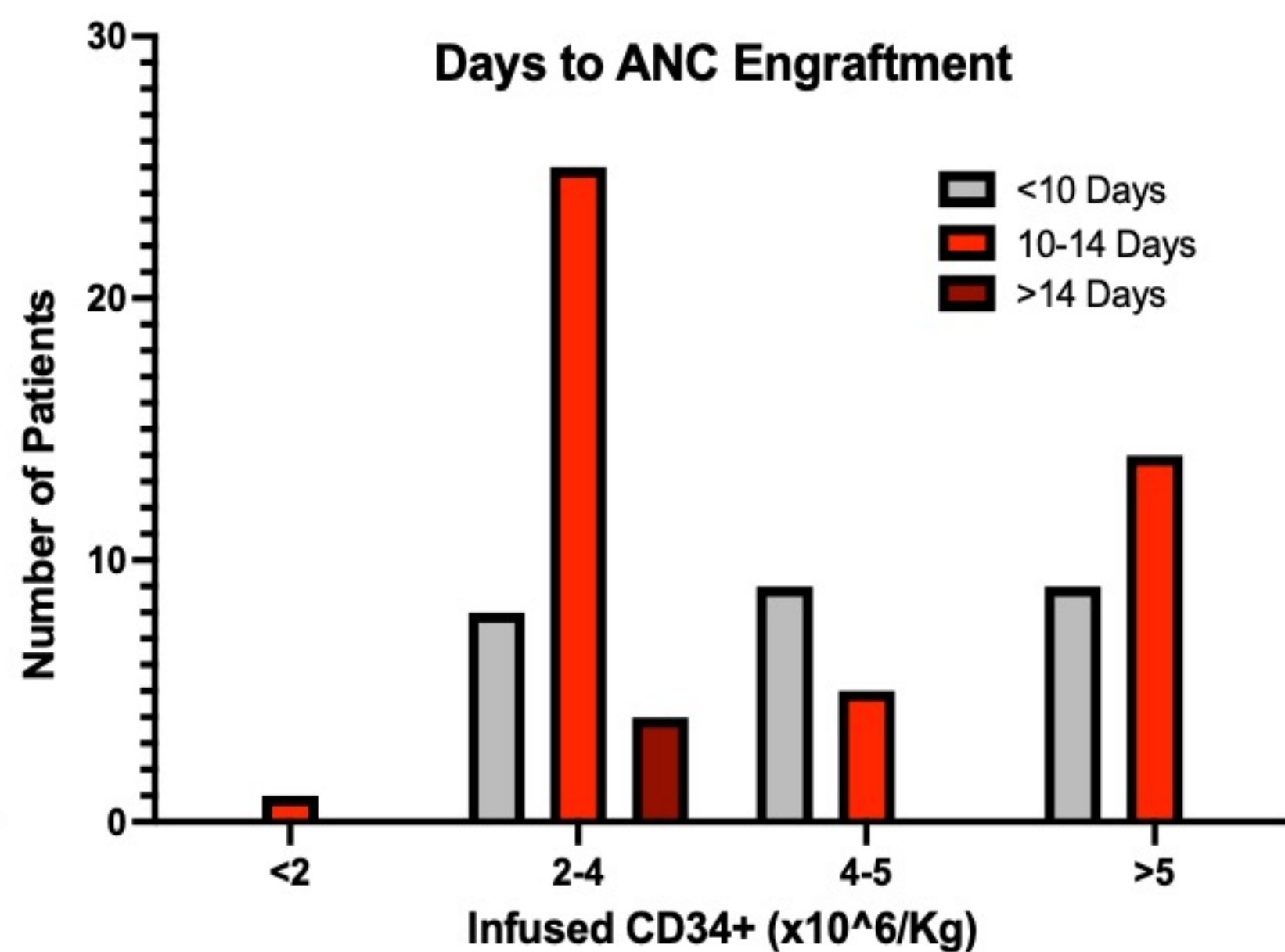
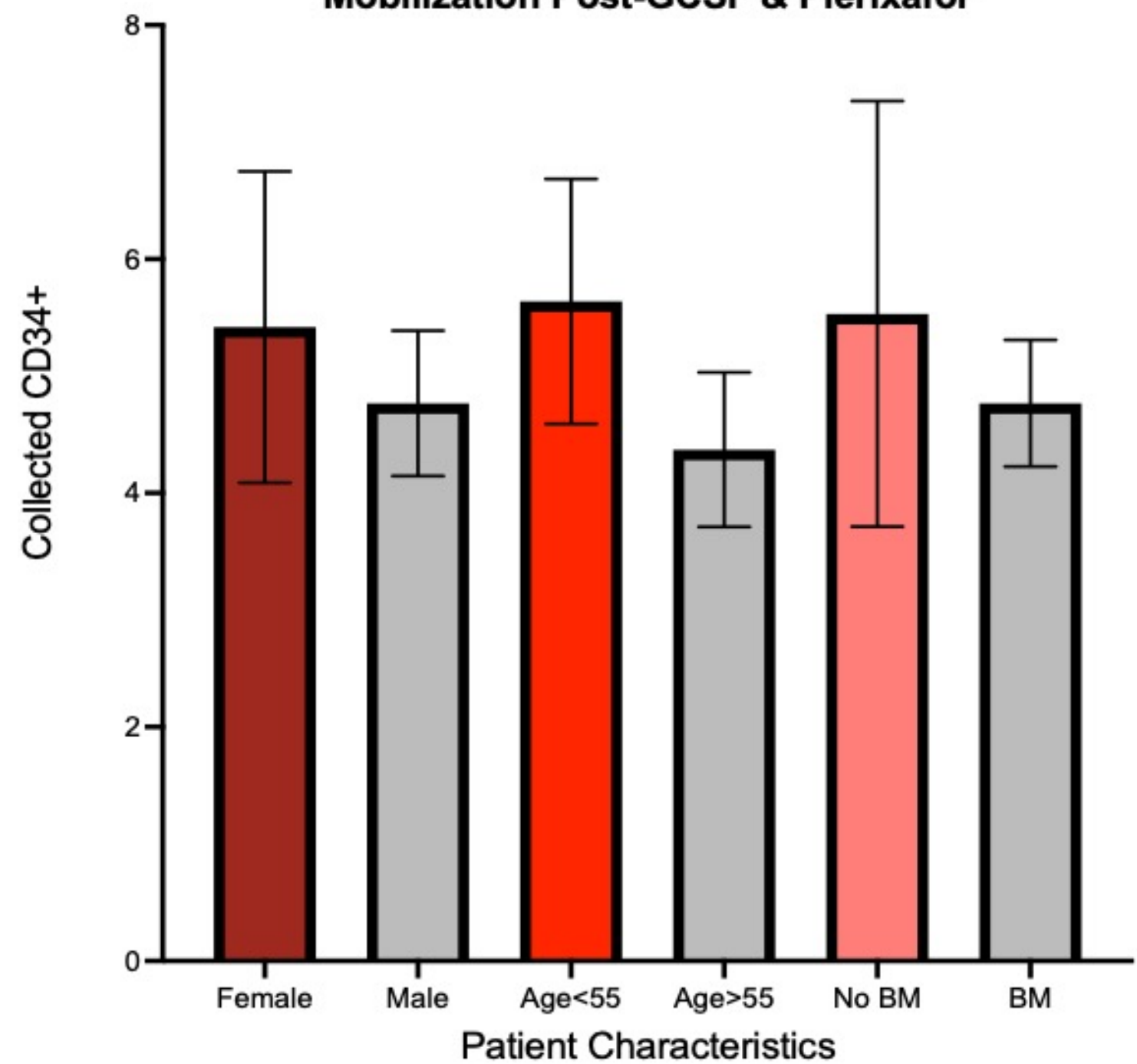
Characteristics of Patients Mobilized with Plerixafor and G-CSF (N = 72)	N (%) or median (range)
Gender: Male – N (%)	43 (60 %)
Body Mass Index (BMI) – median (range)	27 (17 – 39)
Diagnosis – N (%)	
MM	50 (70 %)
NHL	12 (15 %)
HL	7 (10 %)
Other	3 (5 %)
Age at Diagnosis – median (range)	54 (12 – 73)
Age at Auto-SCT – median (range)	55 (22 – 74)
Disease Status at Transplant – N (%)	
CR/VGPR	33 (46 %)
PR/SD	38 (53 %)
PD	1 (1 %)
FISH abnormality – N (%)	11 (15 %)
(MM patients with Del 13q, Del 17p, Trisomy 17, t(11,14), t(4,14), Del 4)	
Bone marrow involvement – N (%)	52 (72 %)
Lines of treatment before Auto-SCT – median (range)	1 (1 – 4)
Induction – N (%)	
PI based	47 (66 %)
Intensive Chemotherapy	19 (26 %)
IMiD based	5 (7 %)
Other	1 (1 %)
Chemo-mobilization – N (%)	16 (22 %)
Peripheral CD34+ (cell/ μ L) post-G-CSF & pre-Plerixafor – median (range)	10 (0 – 73)
Collected CD34 ($\times 10^6$ cells/Kg) post-G-CSF & pre-Plerixafor – median (range)	0.0 (1.5 – 6.5)
Collected CD34 ($\times 10^6$ cells/Kg) post-Plerixafor – median (range)	4.4 (1.1 – 18.6)
Infused CD34 ($\times 10^6$ cells/Kg) – median (range)	3.9 (1.8 – 9.9)
Length of inpatient stay during Auto SCT – median (range)	18 (14 – 42)
Days to ANC engraftment – median (range)	11 (4 – 26)
Days to Platelet engraftment – median (range)	17 (4 – 48)
Progression/Relapse – N (%)	13 (18 %)
MM: Multiple Myeloma; NHL: Non-Hodgkin's Lymphoma; HL: Hodgkin's Lymphoma; Auto-SCT: Autologous Stem Cell Transplant; PI: Proteasome Inhibitor; IMiD: immunomodulator; ANC: Absolute Neutrophil Count; Chemo-mobilization: plerixafor used in conjunction with chemotherapy.	

Figure 2



- The median follow-up was 9 months (1–59).
- 59 (82%) patients had low PSCs, requiring pre-emptive plerixafor prior to apheresis.
- 62% of MM and 54.5% of non-MM patients needed >1 collection.
- 97% of all patients collected CD34+ >2 $\times 10^6$ cells/kg post-plerixafor.
- The median collected final CD34+ cells post-plerixafor was 4.4 $\times 10^6$ /kg (1.84–18.62).

Figure 3
Mobilization Post-G-CSF & Plerixafor



- Factors associated with poor mobilization: male gender, age at diagnosis >55 years, MM, and bone marrow involvement (p=0.041, 0.031, 0.04, 0.012, respectively).
- Median times to absolute neutrophil count (ANC) and platelet engraftment were 11 (4–26) and 17 (4–28) days, respectively.
- A longer ANC engraftment (>2 weeks) was observed in patients who were infused <4 $\times 10^6$ cells/kg (p=0.044).
- At last follow-up, 82% of patients were alive; 90% of whom were in complete remission.

Conclusion

- These results can guide us to use plerixafor early in selected patients who are predicted to fail mobilization.

References

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