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A PRACTICAL APPROACH TO SUCCESSFUL STEM CELL COLLECTION FROM MULTIPLE MYELOMA PATIENTS WITH PERIPHERAL BLOOD CD34 COUNT LESS THAN 2.5 CELLS/ML

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INTRODUCTION

Newly diagnosed multiple myeloma (MM) patients who are transplant candidates face significant challenges, such as transportation, for their one-time stem cell collection. The goal of this study is to show a practical stem cell collection method that provides sufficient stem cells for autologous stem cell transplantation for MM patients even in the face of very low peripheral CD34 counts (pCD34) and to describe how this method benefits rural MM patients.

AIM

In this study we demonstrate how successful stem cell collection is possible even with very low pCD34 counts. Getting sufficient stem cells collected during one single trip to the transplant center is especially important for rural patients who have limited resources.

METHOD

- Established a clinical protocol for autologous stem cell collection from rural MM patients summarized in Table 1.
- For patients who live out of town, G-CSF is administered at 10 mcg/kg at home or their local hospital starting on a Friday for 3 mornings. They then travel to our center on Sunday afternoon and stay at a hotel arranged by our center for the following 5 nights.
- On Monday, following day 4 administration of G-CSF, patients receive plerixafor 0.24 mg/kg every evening starting Monday.
- Depending on each collection product's absolute quantity of CD34-positive cells, patients go home at the end of collection day 1 (Tuesday), 2,3, or 4 (Friday)
- 300 patients reviewed.
- 10 patients found with pCD34 counts <2.5 cells/μL.
- Amongst the 10 patients, 6 patients were excluded.

RESULTS

Table 1. Clinical protocol for stem cell collection from rural multiple myeloma patients in one trip

	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Event	Mobilization day 1	Mobilization day 2	Mobilization day 3	Mobilization day 4	Collection day 1	Collection day 2*	Collection day 3*	Collection day 4*
AM	G-CSF	G-CSF	G-CSF	G-CSF	G-CSF	G-CSF**	G-CSF**	G-CSF**
PM	---	---	---	Plerixafor	Plerixafor***	Plerixafor***	Plerixafor***	
			Arrival in town		Possible departure for home	Possible departure for home	Possible departure for home	Departure for home

*If needed
**If collection continues that day
***If collection continues next day

Age/sex	58/M	62/F	67/M
Prior therapy	D-RVD[1] x 3 mo	RVD[2] x 3 mo	RVD x 3 month, daratumumab with carfilzomib
Response to chemo	VGPR	VGPR	VGPR, PR
Pre-collection pCD34 count (cells/ μL) / WBC (K/ μL)	2.1 / 14.6	1.3 / 15.07	2.3 / 15.2
Collection day 1 pCD34 count (cells/ μL) WBC (K/ μL) Product (PBSC 10^6CD34+ cells/kg)	 25.9 28.7 3.45	 22.03 22.41 1.79	 15.5 20.7 2.23
Collection day 2 pCD34 count (cells/ μL) WBC (K/ μL) Product (PBSC 10^6CD34+ cells/kg)	 32.2 42.1 3.94	 15.7 19.55 2.67	 21.2 28.7 3.39
Collection day 3 pCD34 count (cells/ μL) WBC (K/ μL) Product (PBSC 10^6CD34+ cells/kg)	 11.4 39.5 1.42	 14 23.14 2.76	 30.2 29.6 4.96
Collection day 4 pCD34 count (cells/ μL) WBC (K/ μL) Product (PBSC 10^6CD34+ cells/kg)	N/A	 14.1 25.53 2.4	N/A
Total collected product (PBSC 10^6 CD34+ cells/kg)	8.81	9.62	10.58
PBSC infused for ASCT (10^6 CD34+ cells/kg)	4.16	3.12	N/A
Neutrophil engraftment Platelet engraftment	+11 +12	+11 +14	N/A N/A
Outcome	At 18 months follow up in MRD neg CR, continues on maintenance therapy with monthly daratumumab and low dose lenalidomide	Day+100 restaging studies showed sCR, was started on maintenance therapy with lenalidomide and ixazomib	Refused further therapy and expired in 3 months following collection

CONCLUSIONS

Successful autologous stem cell collection is feasible in MM patients, despite very low pre-collection peripheral blood CD34 counts (<2.5 cells/μL), by routinely adding plerixafor to G-CSF on day 4 of mobilization. This approach is especially important when collecting stem cells from rural MM patients who have limited financial and social support. Considering the high number of rural MM patients with limited resources who are in need of stem cell collection, our practical approach and results are novel and highly relevant for physicians who are treating similar patients.

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