Role of Salvage Autologous Hematopoietic Cell Transplantation in the Era of Novel Immune Effector Therapies: Case Series

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INTRODUCTION

- Current guidelines recommend, transplant-eligible multiple myeloma (MM) patients undergo leukapheresis to collect hematopoietic progenitor cells (HPCs) for two autologous hematopoietic cell transplants (autoHCT).
- However, with the advent of novel immune effector therapies—such as monoclonal antibodies, chimeric antigen receptor T-cell (CAR-T) therapy, and bispecific T-cell engagers—the reliance on salvage autoHCT has decreased.
- Furthermore, older patients may not be candidates for a second autoHCT.
- Given the declining rates of salvage autoHCT, it is important to reassess the routine collection of excess HPCs.
- This study evaluates age-stratified utilization trends, patient demographics, and clinical data (including disease characteristics, previous therapies, and performance status) among patients undergoing two autoHCTs to identify those who may benefit from additional HPC collection.

METHODS

- We conducted a retrospective study at a small transplant center in the upper Midwest.
- A total of 97 patients (aged ≥18 years) with confirmed MM, who underwent HPC mobilization and collection between 2013 and 2023, were included.
- The medical records of the four patients who underwent two autoHCTs were reviewed.

RESULTS

- Of the 97 patients who underwent HPC collection for two autoHCTs (mean age 64.5 ± 8.7 years), only four (4.1%) received a salvage autoHCT.

RESULTS (CONTINUED)

- All four patients were under 60 years old at the time of diagnosis and first transplantation (age range: 37.4–59.2 years).
- Three of these patients received the VRD (bortezomib-lenalidomide-dexamethasone) induction regimen, while one received VCD (bortezomib-cyclophosphamide-dexamethasone).
- One patient had high-risk cytogenetics as per fluorescence in situ hybridization (FISH), while another had standard-risk, and FISH was not performed in the remaining two due to inadequate samples.
- Two patients were diagnosed with stage 1 MM according to the International Staging System, while one had stage 1 and the other stage 3.
- At diagnosis, two patients had an Eastern Cooperative Oncology Group (ECOG) performance status of 1, one had a score of 0, and one had a score of 3.
- Of the four patients, three died from disease progression 3 to 6 years after the second autoHCT.
- One patient relapsed 1 year after the second autoHCT and subsequently underwent CAR-T cell therapy.
- A bone marrow biopsy 1-year post-CAR-T therapy showed no evidence of disease.

CASE NO.	Age at the time of diagnosis (years)	Age at the time of HPC collection (years)	Age at the time of first autoHCT (years)	Age at the time of second auto HCT (years)	ECOG at the time of diagnosis	High risk FISH	ISS Staging
1	41.83	42.25	42.3	44.1	1	Yes	II
2	36.33	37.4	37.4	44.3	3	No	I
3	58.9	59.12	59.2	63	0	Unknown	III
4	52.3	52.78	52.9	55.9	1	Unknown	I

CONCLUSION

- Our study confirms that the utilization of excess HPCs is rare, especially in patients over 60 years old.
- Understanding the age stratified utilization trends of stored cryopreserved autologous HPCs intended for a second autoHCT can identify patient subgroups that would benefit from collection of additional HPCs.
- Key factors such as age at HPC collection, comorbidities, performance status, and cytogenetic risk should guide the decision to collect two autologous HCTs, rather than adhering to a protocol of collecting sufficient HPCs for two autoHCTs for all MM patients.
- Given the improved survival rates conferred by emerging cellular and immunotherapies, and the declining trend in salvage auto-HCT, MM transplantation and cellular therapy centers should reconsider HPC collection goals and guidelines to optimize cost-effectiveness and resource allocation.
- Further research is needed to develop data-driven guidelines for HPC collection in the evolving treatment landscape of multiple myeloma.

References

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