

EFFECT OF CD34⁺ CELL DOSE ON HEMATOPOIETIC RECONSTITUTION AND OUTCOME IN 508 PATIENTS WITH MULTIPLE MYELOMA UNDERGOING AUTOLOGOUS PERIPHERAL BLOOD STEM CELL (PBSC) TRANSPLANTATION

Topic: Hematopoietic stem cells—clinical

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J. Klaus;

University, Heidelberg, GERMANY.

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Keyword: autologous transplantation, multiple myeloma, hematopoietic reconstitution outcome

Background: We analyzed the hematopoietic reconstitution and outcome of 508 patients with multiple myeloma with respect to the number of CD34⁺ cells reinfused at our centre.

Patients and methods: Each cohort of 390 patients (unselected CD34⁺ cell dose) and 118 patients (selected CD34⁺ cell dose) was divided into four subgroups: high dose (HD), intermediate high dose (iHD), intermediate low dose (iLD) and low dose (LD). Different prognostic factors were used to evaluate their significance for reconstitution.

Results: HD patients receiving unselected CD34⁺ cells experienced a reduced median time to leucocyte (13d vs. 14d) ($P<0.001$) and platelet reconstitution $>20 \times 10^9/L$ (10d vs. 12d) ($P<0.001$) compared to LD patients. Similarly, HD patients transplanted with selected CD34⁺ showed a reduced median time to leucocyte (12d vs. 15d) ($P<0.001$) and platelet recovery $>20 \times 10^9/L$ (10d vs. 11d) ($P=0.058$) compared to LD patients. Table 1 shows additional significant factors in terms of recovery for unselected PBSC transplantation.

In terms of supportive care the differences of high/low dose grafts were minimal.

Furthermore, the amount of transplanted CD34⁺ cells had no significant impact on transplant related mortality or CR/PR rates within 100 days.

Conclusions: These results confirm that high doses of CD34⁺ PBSC shorten hematopoietic reconstitution and reduce hospitalization. Nevertheless secure engraftment and outcome until day 100 post-transplantation can be achieved by transplantation of $2.00-3.00 \times 10^6$ CD34⁺ cells/kg.

Table 1 Significant factors for hematopoietic reconstitution (unselected PBSC transplantation)

Reconstitution-Parameters	Significant factors
Leukocyte $\geq 1.0 \times 10^9/l$	CD34 ⁺ cell dose ($P<0.001$), age at PBSCT ($P=0.03$), disease status at PBSCT ($P=0.024$)
Granulocyte $\geq 0.5 \times 10^9/l$	CD34 ⁺ cell dose ($P<0.001$), age at PBSCT ($P=0.0035$)
Platelets $\geq 20 \times 10^9/l$	CD34 ⁺ cell dose ($P<0.001$), previous radiation ($P=0.021$), number of months pre-treatment with alkylating agents ($P=0.0027$)
Platelets $\geq 50 \times 10^9/l$	CD34 ⁺ cell dose ($P<0.001$), previous radiation ($P=0.037$), number of months pre-treatment with alkylating agents ($P<0.001$), number of months with previous therapy cycles ($P=0.02$)