

P.73

Longitudinal monitoring of immune reconstitution after allogeneic peripheral blood stem cell transplantation (PBSCT): impact of T cell depletion of the graft

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Background

T cell depletion by the positive selection of CD34+ cells of the graft is an effective way to reduce the incidence of graft-versus-host disease following allogeneic PBSCT. However, it might impact immune reconstitution.

Patients and methods

In this retrospective study, we compared the kinetics of recovery of T-, B- and NK-cells compartments in two groups of patients who had undergone allogeneic PBSCT after high dose conditioning: a first group who received CD34-selected PBSC (CD34 group, n= 62), and a second group given unmanipulated PBSC (PBSC group, n= 43). Of note, 45 of 62 patients in the CD34 group received pre-emptive CD8-depleted donor lymphocyte infusions starting at days 40-60 after PBSCT in an effort to prevent disease relapse. Lymphocyte phenotyping was performed by flow cytometry on days 28, 40, 60, 80, 100, 180 and 365, and then yearly thereafter.

Results

CD4+ T cell reconstitution was slow in the two groups of patients, with normal levels reached only after 18 to 24 months post-PBSCT. The number of naïve CD4+ T cells (CD4+CD45RA+) was particularly low throughout the first 24 months and was significantly lower during the first 80 days after transplantation in the CD34 group than in the PBSC group. Normal levels of NK (CD3-CD56+) cells and CD8+ (CD3+CD8+) T cells were reached by one month after PBSCT and were similar in CD34 and PBSC patients. Finally, B cell counts achieved lower limits of normal values six months after PBSCT and were similar in CD34 and PBSC patients.

Conclusions

This study suggests that the T cell depletion of the graft induced a delayed immune reconstitution for naïve CD4+ T cells after allogeneic PBSCT with high dose conditioning. Data on thymic recovery and T cell diversity repertoire in the two groups will be presented.