

CLINICAL SIGNIFICANCE OF NK CELL REGENERATION AFTER AUTOLOGICAL STEM CELL TRANSPLANTATION

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Aim: The main objective of the study was to investigate the dynamics of NK cell regeneration after autologous hematopoietic stem cell transplantation (AHSCT) and its potential clinical significance.

Materials and methods: The study included 58 patients (27 men and 31 women), with a mean age of 31.4 (14-58) years, and a control group of 28 healthy individuals. The quantitative assessment of the NK-cell population -% and absolute number (AC), was made by multiparameter flow cytometry in 9 different time points. Functional recovery and cytolytic capacity were assessed by monitoring a subpopulation of highly cytotoxic NK cells, defined as CD56+ CD160+ CD8high+. Patients with different diagnoses were studied, including lymphoma (n=32); leukemia (n=7); solid tumors (n=12) and multiple myeloma (n=7). At the time of transplantation, 17 patients had achieved complete remission (CR) or very good partial response (VGPR), 31 patients had partial remission (PR), and 10 patients were in progression.

Results: Quantitative recovery of CD56+ NK cells showed low starting values, below average for the control group, in all patients, and after increasing in the 2nd month to an average of 12.387%, with negligible dynamics, percentages remained below average and AC stabilized around the lower limit. Higher starting levels of % CD56 + NK cells were found in patients with solid tumors before AHSCT (mean 14.16%), as well as different dynamics of % NK cells in the group of patients with multiple myeloma. Mean % and AC NK cells levels did not show significant differences according to age, type of therapeutic protocol, achieved therapeutic response at the time of transplantation. NK cell levels did not show a correlation with hematological reconstruction parameters or with the incidence of infectious complications up to day +100. Lower mean % and AC NK-cell counts were observed in patients with early recurrence. The assessment of PFS showed 75% of non-relapsed survivors in the group of patients with restored NK-cell levels compared to 48.6% in the group of patients with non-restored levels ($p < 0.05$).

Conclusion: The dynamics of NK-cell population recovery shows a faster reconstruction compared to other cell populations. Recovered levels of AC NK cells after AHSCT significantly affect the risks of recurrence and survival after transplantation.