

Influence of chimerism in T-regulatory cells on relapse rate in acute leukemia patients after allo-HSCT

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Introduction. T-regulatory cells (Treg) prevent the development of graft-versus-host disease (aGVHD) after allo-HSCT (Beres & Drobyski, 2013). At the same time these population can limit the antitumor response (graft-versus-leukemia, GVL) that can cause relapses. We report data of chimerism in Treg population and the frequency of relapses in acute leukemia patients (ALL and AML) after allo-HSCT.

Aim. To evaluate a possible relationship between the mixed chimerism in Treg cells and the rate of relapses in acute leukemia patients after allo-HSCT.

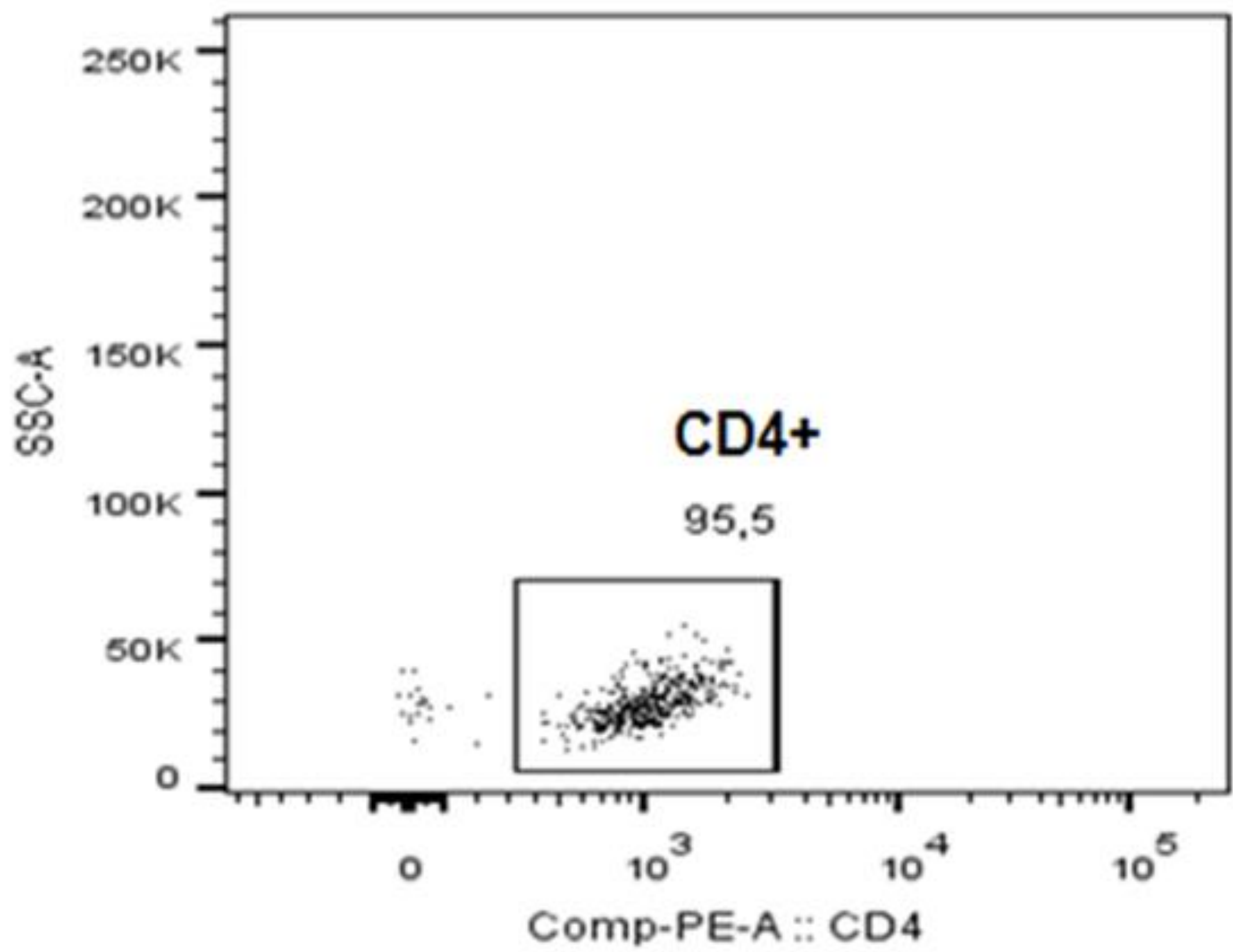
Method(s). The study included 31 patients after allo-HSCT (ALL n = 6, AML n = 25). The median age was 38 years (19-66). Peripheral blood samples for analysis were taken on day +30 after transplantation. Immunomagnetic separation (Miltenyi Biotec, Germany) was used to isolate population with CD4+CD25+ phenotype which is predominantly associated with Treg cells. Extraction of DNA was performed from the obtained cells. Chimerism in DNA samples were determined using the STR-PCR method. The percentage of donor chimerism was calculated using standard procedures (Nollet et al., 2001) Statistical analysis of the data was carried out using SPSS ver 23 (IBM, Chicago, Ill., USA). Exact Fisher’s test was used to analyze the 2 × 2 contingency tables.

Results. In the group of patients with less than 11% of cells with host genotype (more than 89% of cells of donor origin) the relapse rate was significantly higher - 52.6% (10 of 19) than in the other group of patients with 11% and more cells with host genotype - 8.3% (1 of 12), (p = 0.02). At the same time donor chimerism in the unselected bone marrow did not differ significantly from the groups (p = 0.36) and reached 100% (75-100%) and 97.5% (90-100%). The study groups were balanced for all other factors that could affect the relapse rate: disease status, graft source, GVHD.

Conclusion(s). According to our data we proposed that host’s Treg cells are not capable to suppress GVL that explains significant differences in relapse frequencies in patients with acute leukemia after allo-HSCT. Predominance of host’s Treg cells may be a favorable prognostic sign but this hypothesis needs to be confirmed on the larger cohort of patients.

Cells with host genotype	Relapse	No relapse	p-value
<11%	52.6% (n=10)	47.4% (n=9)	0.02*
≥11%	8.3% (n=1)	91.7% (n=11)	

Table 1. Relapse rate depending number of Treg cells with host genotype



Picture 1. The frequency of the selected population using immunomagnetic separation