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Bone Marrow Transplantation in Patients with Sickle Cell Anemia: Impact of Thymoglobulin on Transplant Outcomes.

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Background. Thymoglobulin (rabbit ATG, Genzyme) was added to the BuCy conditioning regimen to reduce the risk of rejection in patients undergoing BMT for SCA. However, it remains unknown whether ATG has any effect on survival in SCA patients. Here we compare outcome of BMT in 17 SCA patients who received ATG before transplantation to 33 patients who did not.

Methods. Between July 2004 and November 2015, 50 consecutive patients with median age of 11 years (range, 1.7-17.1 years) with SCA received their first BMT from HLA-identical sibling donors. Of these patients, 17 were prepared for transplantation with oral (n=5) or weight-based iv Bu Cy200 ATG 10 (ATG group) and 33 patients with Fludarabine 150 iv Bu Cy200 (non-ATG group). GVHD prophylaxis consisted of CSA/Methylprednisolone/short MTX. Sixty five percent of patients in the ATG group versus 6% in the non ATG group (p=0.00002) were on regular chronic blood transfusion.

Results. All 50 patients had sustained engraftment. Platelet and neutrophil engraftment kinetics were similar between groups. The incidence of acute or chronic GVHD was similar in the 2 groups. The incidence of grade 2-4 aGVHD in the ATG and non-ATG groups were 35% (95% CI 8-55%) and 33% (95% CI 15-48%), respectively. The incidence of grade 3-4 aGVHD was 0% in the ATG, and 20% (95% CI 4-33%) in the non-ATG group (p=0.07). The incidence of moderate or severe chronic GVHD were 11% (95% CI 0-25%) in the ATG and 22% (95% CI 5-34%) the non-ATG group (p=0.4). For all patients the probability of disease-free survival (DFS) was 87% (95% CI 73-94%). DFS was superior in the ATG group (100%) compared with the non-ATG group [79% (95% CI 60-90%)] (P=0.050). In the non-ATG group 6 patients have died from severe acute or chronic GVHD-related complications. Infectious complications were similar between the 2 groups.

Conclusions. We report excellent DFS in SCA patients who received ATG as part of the conditioning regimen. The use of ATG in the conditioning regimen was associated with a low incidence of grade 3-4 aGVHD, although it was not statistically significant (p=0.07). The addition of fludarabine to the standard BuCy regimen was well tolerated, and successfully prevented graft rejection in SCA patients. Further study, using low dose ATG in the FluBuCy regimen to increase DFS is warranted.