

**Comparing efficacy and toxicity of conditioning regimen “treosulfan+cyclophosphomide” versus “busulfan+cyclophosphomide” in children with hematological malignancies after allogeneic hematopoietic stem cell transplantation**

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**Abstract**

**Background:** Allogeneic hematopoietic stem cell transplant (allo HSCT) is a curative approach for children with hematological malignancies but is associated with high treatment-related morbidity and mortality. A conditioning regimen (CR) with reduced toxicity is a potential option used in these cases. Treosulfan is an alkylating agent with high antileukemic, myeloablative activity and low toxicity. We compared the efficacy and toxicity of two conditioning regimens in allo HSCT: treosulfan (Treo)+cyclophosphamide (CY) (first group) and busulfan (BU) +CY (second group).

**Patients and methods:** The first group—with a follow-up from Feb. 2004 to Nov. 2007—had 11 patients (pts): 6 boys and 5 girls; a median age of 9 y.o.; ALL – 10 pts and AML – 1 pt; CR: Treo 30–42 g/m<sup>2</sup> and CY 120mg/kg; HSC donors: 2 matched related donors (MRD) and 9 matched unrelated donor (MUD). The second group—with a follow-up from Nov 2000 to Nov 2006—had 31 pts: 19 boys and 12 girls; a median age of 12 y.o.; AML – 7 pts, ALL – 24 pts; HSC donors: 11 MRD and 20 MUD; CR: BU 16 mg/kg and CY 120mg/kg. Prophylaxis for aGVHD: CsA+MTX. Unrelated allo-HSCT pts received ATG (“Pfizer”) 60 mg/kg.

**Results:** First vs second group: engraftment on day +17 vs +21, primary non-engraftment 0% vs 6% (p<0.05), hemorrhagic complication 18 vs 68% (p<0.05). Common toxicity criteria (CTC) II/IV: VOD 0% vs 3% (p<0.05), mucositis 18% vs 68% (p<0.05), neurology symptoms 9% vs 23% (p<0.05), hepatic toxicity 18% vs 26%. aGVHD III/IV 36% vs 20%, relapse 27% vs 29%. Three-year overall survival (OS) 37% vs 40%, respectively.

**Conclusion:** A treosulfan-based conditioning regimen is well tolerable, safe, efficient, and can be used in heavily-pretreated children with severe complications after previous chemotherapy; though in comparing the efficacy of both regimens, there are no differences.

**Keywords:** allo-HSCT, toxicity, efficacy, treosulfan, busulfan