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Outcomes of Childhood Relapsed Acute Lymphoblastic Leukemia and the Role of Hematopoietic Stem Cell Transplantation in Lithuania

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Background. Long-term survival rates of childhood acute lymphoblastic leukemia (ALL) approach 90%, however, still a proportion of children will suffer from a relapse. Only around 50% of children with a first relapse survive long-term, and the outcome is much worse with a second or later relapse.

Aim of the study. To analyze the incidence and treatment results of childhood ALL relapses in Lithuania throughout different time periods. **Methods.** Retrospective analysis of data of 98 children (out of 105) with relapsed T- or B-cell precursor ALL treated in Lithuania during the four time periods: 1992-1996 (N=38), 1997-2002 (N=33), 2003-2008 (N=16) and 2009-2018 (N=18) for whom the data was available.

Results. Median follow-up (quartiles) for four periods was 18.2 (17.9-18.2), 15.1 (9.2-16.8), 12.6 (10.9-14.5) and 3.9 (2.0-6.1) years, respectively. Overall survival (OS) improved over periods, with 3-year OS being 30±7%, 28±8%, 44±12%, 50±12% respectively, although non-significantly. Twenty-four patients received allogeneic hematopoietic stem cell transplantation (HSCT) for very early (n=7), early (n=5) or late (n=12) relapse. Survival improvement was seen over the four time periods, 3-year OS being 0%, 43±19%, 50±16% and 89±11%, respectively. Busulfan, cyclophosphamide and etoposide were used for conditioning for 20/24 patients (83.3%).

Conclusions. Cure for children with relapsed ALL remains challenging although reaching the rates reported by the large international groups during the last decade. Improving laboratory possibilities allowing more accurate MRD assessment, stratification of relapsed patients to alloHSCT versus chemotherapy and identification of the best possible stem cell donor as well as increasing experience of our bone marrow transplantation center can be named as one of the reasons for improving alloHSCT results which in turn add to the improvement of survival rates.