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Immunophenotypic Features in the Detection of Minimal Residual Disease in Acute Lymphoblastic Leukemia †

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Abstract: The most common hematologic malignant disease in pediatric patient is acute lymphoblastic leukemia (ALL). The blast clearance rate during therapy is a major prognostic factor of outcome in children with ALL. The blastic population can be recognized by their clonal rearrangement of immunoglobulin and T-cell receptor genes expression of gene fusions (using quantitative PCR) and leukemia-associated immunophenotypes (with multiparameter flow cytometry). These methods can detect one ALL cell among 10,000 to 100,000 normal cells in clinical samples. Owing to these technologies, in this presentation, we would like to describe our experience from Fundeni Clinical Institute in establishing MRD (minimal residual disease) using multiparametric flow cytometry (MFC) in children undergoing ALL BFM 2002/2009 protocol for ALL. In this retrospective study, we have included children with ALL treated according to the BFM ALL IC 2009 between January 2016 and December 2018 at the Fundeni Clinical Institute, Bucharest, Romania. In the current study, we have shown that non-relapse mortality (NRM), overall survival (OS), and event-free survival (EFS) was independently predicted by prednisone response and MFC-MRD on day 33. In conclusion, minimal residual disease (MRD) is gaining clinical importance to establish: the levels of MRD that are relevant to the therapeutic decision and the relapse risk estimation. In our study, we observed that prednisone response, MFC-MRD on day 33, and the risk group represent the most important factors that independently predict childhood ALL prognosis.

Keywords: minimal residual disease; multiparametric flow cytometry; acute lymphoblastic leukemia.

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Conflicts of Interest

The authors declare no conflict of interest.