

So far, the lymphoid to myeloid lineage switch during the treatment of B cell precursor acute lymphoblastic leukemia (BCP ALL) was identified only rarely in patients with the MLL gene rearrangement. We discovered a novel BCP ALL subset switching to monocytoid lineage during an early phase of the treatment – swALL (“switching” ALL) with no MLL gene rearrangement. The proportion of swALL cases among BCP ALLs was unexpectedly high (3-4%). All swALLs have expressed the CD2 antigen (LFA-2). The upregulation of C/EBP α gene and hypomethylation of the CEBPA promoter were significant in blasts already at diagnosis, preceding the lineage switch in the majority of the cases. SwALL patients were characterized by unique subpopulation of the cells coexpressing B lymphoid and monocytoid markers. Changes in the gene expression of M-CSFR, GM-CSFR and other genes accompanied the lineage switch. The lineage switch could be recapitulated in vivo and in vitro. Even if the children patient with swALL respond slowly to initial therapy, the prognosis is comparable to “other” BCP ALLs. Risk-based ALL therapy appears to be the treatment of choice for swALL.