Mature B-cells, B-cell progenitors and plasma cells in B-ALL patients enrolled in RALL-2016 study

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Abstract

The number of normal mature B-cells (MBC), B-cells progenitors (BCP) and plasma cells (PC) in B-ALL patients provides the possibility of an antigen-associated immune response.

Objective

The aim of the study was to assess amount of MBC, BCP and PC in B-ALL patients enrolled in RALL-2016 study at different stages of protocol.

Study design

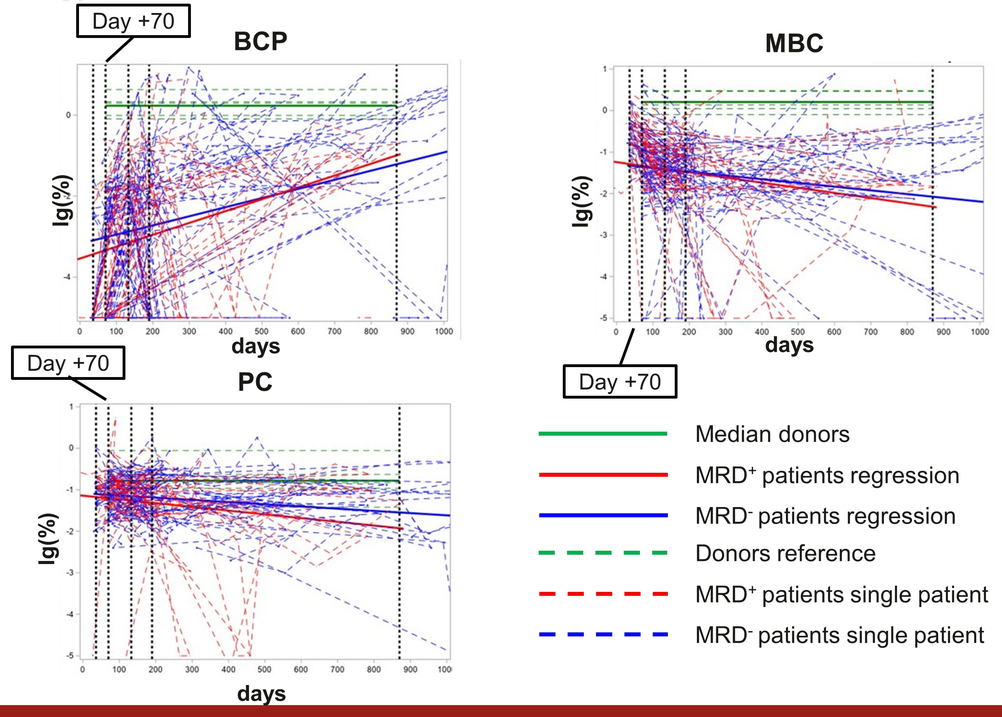
This study included data from 2016 to 2020 years of patients enrolled in Russian multicenter study RALL-2016 (NCT03462095). The amount of MBC, BCP and PC and minimal residual disease (MRD) status were assessed in the bone marrow (BM) by flow cytometry.

Materials & Methods

We assessed the MRD status and the number of MBC, BCP and PC in 88 patients with B-ALL at all points of the protocol and maintenance therapy. Analysis of MRD status was performed by 6- or 10-color flow cytometry. To analyze the dynamics of changes in the number of B-cell depending on the MRD status on the 70th day of therapy the regression dependences were done. Differences between groups of patients and donors (n=5) was estimated with ANOVA-test.

Results

During therapy, the number of MBC ($p < 0.0001$) and BCP ($p < 0.0001$) significantly changes and does not depend on the MRD status ($p > 0.05$) on the 70th day of therapy ($p < 0.0001$). The count of MBC and BCP was less in B-ALL patients than in donors at all stages of therapy. There was no change in the number of PC.



Conclusion

The obtained results indicate that the cytostatic treatment used in the RALL-2016 protocol had minimal effect on differentiated B cells. In this way, a stable number of the most differentiated B cells can contribute to the maintenance of humoral immunity. BCP were more sensitive to cytostatic effects and were not recovered for more than a year after the end of treatment. The absence of changes in PC count may indicate the resistance of this cell population to ongoing chemotherapy.

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