TREATMENT OF ACUTE LEUKEMIA – A PARADIGM OF PERSONALIZED MEDICINE.

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In recent years a new approach for treating patients – personalized medicine - is being developed at a fast pace. This new approach tries to incorporate all the available information about any individual patient, especially his genetic background, in order to provide a treatment which is the best for this particular person. The most significant advances in this regard have been made in the field of oncology as not only individual's genetic particularities but also unique features of his tumor cells are being used with great success. In this regard treatment and monitoring of acute leukemia is at the forefront of personalized medicine. In acute leukemia were and are continuing to be described new molecular markers which allow patient risk stratification and use of specific treatments acting on specific targets which are unique in every patient.

Materials and methods: for this study we analyzed 296 samples from patients at presentation using an in house developed multiplex RT-PCR for identification of 9 most frequent fusion genes identified in acute leukemia (both ALL and AML). For follow-up we analyzed 191 samples by nested RT-PCR and RT-qPCR for detection of minimal residual disease (MRD) using fusion genes identified by multiplex RT-PCR as molecular targets.

Results: In 105 out of 296 cases we identified one of the 9 most common fusion genes in acute leukemia. Thus for 35.5% of patients risk stratification could be performed using this information. Furthermore, this also allowed MRD monitoring for a part of this patients which proved to be very useful from clinical point of view as it identified patients with therapy resistance or early relapse.

Conclusions: treatment of acute leukemia is currently considered as personalized medicine paradigm as it incorporates a continually expanding number of molecular markers which are first used for risk stratification and MRD monitoring and most importantly are considered for development of specific treatments targeting these molecular markers or pathways in which they are involved.