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Session 3 – Oral presentation *S3-02*

PHARMACOGENOMICS AND PHARMACOTRANSCRIPTOMICS OF ACUTE LEUKEMIA IN CHILDREN: A PATH TO PERSONALIZED MEDICINE

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Personalized medicine is focused on research disciplines which contribute to the individualization of therapy, like pharmacogenomics and pharmacotranscriptomics. Acute lymphoblastic leukemia (ALL) is the most common malignancy of childhood. It is one of the pediatric malignancies with the highest cure rate, but still a lethal outcome due to therapy accounts for 1- 3% of deaths. Further improvement of treatment protocols is needed through implementation of pharmacogenomics and pharmacotranscriptomics. Emerging high-throughput technologies, microarrays and next-generation sequencing, have provided an enormous amount of molecular data with potential to be implemented in childhood ALL treatment protocols. In the current review, we summarized the contribution of these novel technologies to pharmacogenomics and pharmacotranscriptomics of childhood ALL. We have presented data on molecular markers responsible for efficacy, side effects and toxicity of the drugs commonly used for childhood ALL treatment, i.e., glucocorticoid drugs, vincristine, asparaginase, anthracyclines, thiopurines and methotrexate. Big data was generated using high-throughput technologies, but their implementation in clinical practice is poor. Research efforts have to be focused on data analysis and designing prediction model using machine learning algorithms. Bioinformatics tools and implementation of artificial intelligence are expected to open the door wide for personalized medicine in clinical practice of childhood ALL.

Keywords: pharmacogenomics, pharmacotranscriptomics, high-throughput analysis, childhood acute lymphoblastic leukemia

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