МЕДИЦИНСКИ УНИВЕРСИТЕТ - ВАРНА "Проф. д-р Параскев Стоянов"

Ул."Марин Дринов" 55, Варна 9002, България Тел. : 052/ 65 00 57, Факс: 052/ 65 00 19 e-mail: uni@mu-varna.bg, www.mu-varna.bg



MEDICAL UNIVERSITY - VARNA "Prof. Dr. Paraskev Stoyanov"

55, Marin Drinov Str., 9002 Varna, Bulgaria Tel.: +359 52/ 65 00 57, Fax: + 359 52/ 65 00 19 e-mail: uni@mu-varna.bg, www.mu-varna.bg

## Fund "Nauka" Project № 21022 Resume – Competitive-based Session 2021: "A study of innovative inflammatory markers in children with septic and critical conditions"

## Project leader: Prof. Temenuga Zhekova Stoeva, MD, PhD

Critical septic conditions caused by infectious pathogens are one of the leading causes of death in children globally. The lack of introduced algorithms for rapid assessment of the condition of these patients, the use of inflammatory markers with low specificity and sensitivity and the use of standard microbiological methods pose a risk of delaying the diagnosis and treatment in children with infectious complications. The improper antibiotic use and the increasing phenomenon of "antimicrobial resistance" further worsens the prognosis of patients in the pediatric population and increase the risk of mortality.

The aim of this project is to create and test a convenient algorithm for early assessment, diagnosis, and treatment of septic conditions in children. Seventy-five children aged 0-18 with an acute infection or in a critical condition who are admitted to a pediatric intensive care unit (PICU) will participate and the results will be compared with a historical control group of children with the same conditions who were admitted to the PICU in the last 5 years.

The patients will be examined by questionnaire, anthropometry, and physical examination. The physiological condition of patients will be assessed using pSOFA, PRISM III and IV scores and their risk of mortality will be calculated. Blood samples will be taken from all participants to determine the routine biochemical parameters, procalcitonin. Innovative markers of inflammation will be studied -Presepsin, sMR (soluble mannose receptor) by ELISA method for research purposes. The species identification of the pathogens will be performed by an innovative and rapid method with high sensitivity and specificity (MALDI-TOF-MS), based on microbial protein analysis, incl. direct identification of the causative agent in the blood sample within 1-2 hours. The main goal will be reached by a of researchers, which multidisciplinary team includes habilitated scientists, postdoctoral students, PhD students, young scientists.

As a result of the project, it is expected:

- 1. To create a comprehensive assessment of critical and septic conditions in children by using innovative scores for the first time in Bulgaria;
- 2. To find a correlation between the effectiveness of new inflammatory laboratory markers with the old ones and to choose the most appropriate combination of markers for an early detection of inflammation in the course of sepsis development in children;
- 3. To improve the diagnostic process of microbial identification by using an innovative method for early detection of the infectious pathogen associated with the septic condition.

The proposed goals, methods, techniques for this project and the expected results are of fundamental significance for the development of science. The project will enrich the experience of the research team, increase their skills, and contribute to the implementation of innovative methods in the routine practice. This will increase both the capacity of Bulgarian research teams and their visibility in Europe. The dissemination of the results will enrich the scientific knowledge and improve the recognizability of the research team. More importantly, the project will help the prevention, prognosis and will improve the therapeutic approach in children with septic and critical conditions.