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The use of "omics" technologies in sepsis diagnostics

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Sepsis is the most frequent cause of death in noncoronary intensive care units (ICUs). In the past 10 years, progress has been made in the early identification of septic patients and their treatment. These improvements in support and therapy mean that mortality is gradually decreasing; however, the rate of death from sepsis remains unacceptably high. Since there is no such thing as "a magic bullet" in the diagnosis of sepsis, the clinical diagnosis with general variables, inflammatory variables, haemodynamic variables, organ dysfunction variables and tissue perfusion variables remains the gold standard. With further progress in knowledge of the human genome, questions have now been focused on understanding the immune response in sepsis for example whether the gene expression differs with infectious and non-infectious etiologies. New methodologies – DNA and RNA microchips have brought about the possibility of complex investigations to try to get to such answers. Studies from the turn of millennium showed the immune response to be stereotypical with infection but different with various types of infectious agent. In recent years significant efforts have focused on proteomics followed by genomics and transcriptomics with the objective of defining proteins in the cells, tissues, or organism, and their relation to the septic process. Through this approach, it is hoped to find new biomarkers that could diagnose or track progression of sepsis or predict its incidence or outcome. Using new technology in molecular biology – genomics, proteomics, transcriptomics and metabolomics is likely to achieve improvements in diagnostics and pathogenetic research of sepsis. This knowledge is very promising in terms of selection of appropriate immunotherapy for individual patient according to principles of personalized medicine. We believe that similar therapeutic approach as in hemato-oncology including targeted intervention on different levels of pathological process of patient's immune system will be possible.

Biography

Miroslav Prucha has completed his PhD at Masaryk´s University in Brno and Postdoctoral Studies from Charles University School of Medicine in Prague. He is working in Homolka Hospital in Prague with special interest in the field of Sepsis Diagnostic. He has published papers in reputed journals and has been serving as an Editorial Board Member of repute.

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