ABSTRACT

CHARLES UNIVERSITY IN PRAGUE
Faculty of Pharmacy in Hradec Králové
Department of Biological and medical Sciences

Candidate: Bc. Aneta Jahnová
Supervisor: MUDr. Pavla Paterová, Dept. of Clinical Microbiology FN Hradec Králové
Consultant: primářka MUDr. Alena Ševčíková, Dept. of Clinical Microbiology FN Brno
Title of diploma thesis: Identification of bacteria from positive blood cultures by mass spectrometry.

Background: During processing positive blood culture at the Department of Clinical Microbiology, University Hospital Brno MALDI-TOF MS is used to for rapid and reliable identification cultured bacteria growing pure culture after five to six hours on solid culture media. The aim of this study was evaluated and compared methods for direct identification of the etiological agents from positive blood cultures using a kit SepsiTyper™ and test tubes with gel, which should decrease the time to obtain the result.

Methods: In this study were tested 50 positive BacT/ALERT blood cultures. Preparation of microbial samples was carried out parallel using a kit SepsiTyper™ and collection test tubes with gel. In both methods was performed extraction with ethanol/formic acid and analyses on a Microflex LT system.

Results: From fifty testing blood cultures were correctly identified by kit SepsiTyper 24 samples (48 %) at the species level and 7 samples (14 %) at the genus level. Test tubes with gel were found correctly identified 12 (24 %) of the tested samples. In both methods Gram-negative bacteria show better results compared to Gram-positive pathogens. The most accurate results were obtained by identification bacteria growing izolates on the solid culture media (detection 48/50 cultures, 96 %).

Conclusions: Although the method of direct identification reduces the time required to obtain the results, but the identification of etiological agents is not nearly as accurate and reliable as subcultures on the solid culture media. From methods of direct identification was more successful kit SepsiTyper™. In comparison with test tubes containing gel delivered better identification scores and quality of specters. However, both methods require further technical development and would be difficult to classification into routine microbiological diagnostics.

Keywords: Bloodstream infection, blood cultures, MALDI-TOF MS, direct identification of microorganisms, kit SepsiTyper^{TM}, test tubes with gel.