TITLE: Blood culture extraction from the bottle

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ABSTRACT:

The anticipated knowledge of the identification of microorganisms causing blood stream infections is of utmost importance to adjust the empirical treatment and reduce mortality. Our objective was to evaluate the performance of the protein extraction method and MALDI-ToF MS directly from positive Bactec (Becton-Dickinson) blood culture vials. A retrospective survey of the laboratory database was carried out. The first 1,000 positive blood cultures collected during the period from December 2018 to May 2019 were included in the study. Concentration of bacteria, protein extraction and MALDI-ToF MS analysis were performed as previously described (Moussaoui et al., 2010), in a maximum of one hour after they were detected as positive by the instrument. Four spots were prepared for each microbial cells concentrate. Results were considered adequate only if the identification index was ≥ 99%. Blood cultures were performed using Bactec Aerobic and Anaerobic Plus® vials and Bactec FX systems (Becton-Dickinson). Positive cultures were subcultured on sheep blood and chocolate agars. Identifications obtained with colonies on solid media were compared with those obtained using microbial cell pellets, both using the Vitek MS system (bioMérieux). Among 1,000 positive vials, 58% were aerobic plus and 42% anaerobic plus. Concerning the Aerobic Plus® vials, 68% (total n= 213) of all Gram negative bacilli (GNB), 51% (total n=232) of all Gram positive cocci (GPC), 36% (total n= 11) of all Gram positive rods and 4% (total n=46) of all yeasts were correctly identified by the Vitek MS. Concerning the Anaerobic Plus vials, 74% (total n= 172) of al GNB, 48% (total n= 214), 100% (total n=2) of all Gram positive bacilli and none of the yeasts (n=9) were identified by the Vitek MS. In conclusion, MALDI-ToF MS with Vitek MS and protein extracts prepared from positive Bactec bottles using gel separator tubes generated acceptable identification rates only for Gram negative bacilli. For Gram positive bacteria, there was a low identification rate. The method is inadequate for yeast identification.

Keywords: bacterium, blood culture, extraction.

Development Agency: Microbiology Fleury Group, Hospital Beneficência Portuguesa.