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T2Bacteria panel in diagnostics of sepsis: the first experience at the University Hospital Centre Zagreb

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Background: T2Bacteria® Panel (T2 Biosystems®) is the first and only FDA and CE-marked test to identify sepsis-causing bacteria directly from whole blood in 3 to 5 hours, which would aid in prescribing earlier appropriate antimicrobial treatment. The aim of the study was to show our first experience with this unique new technology in septic patients.

Materials/methods: From December 2018 to March 2019 T2Bacteria® Panel (T2BP) was used in the following groups of septic patients: medical and surgical intensive care unit (ICU), hematology and solid organ transplant. Four mL of blood for T2BP was collected in a K2EDTA tube and one set of blood cultures (BC) was simultaneously obtained. T2BP results were compared against concomitant drawn blood cultures and additional microbiological results within 14 days of T2BP sample.

Results: A total of 29 patients, 21 (72,4%) male and 8 (27,6%) female, were included with age ranging from 0 – 83 years and twenty-six (89,6%) of them at the ICU. T2BP was positive in 13 (44,8%) and BC in 6 (20,7%) of patients. When T2BP results were compared to BC (on panel bacteria only), 2 patients were T2BP+BC+, 11 patients T2BP+BC-, 16 patients T2BP-BC-, and no patients T2BP-BC+. Average time to positive result with T2BP was 4 hours and 40 minutes and in two patients with concomitantly positive BC for panel organisms 86 hours and 30 minutes. Average time to negative result was 5 hours and 6 minutes with T2BP and 120 hours with BC. When analyzing the significance of 13 T2BP+BC- results in the context of all other available microbiological data, 11 additional results otherwise missed by BC were identified, one was probably false-positive and for one there were no data available. Statistical analysis showed 100,0% positive percent agreement (PPA), 90,0% negative percent agreement (NPA), 100,0% negative predictive value (NPV) and 84,6% positive predictive value (PPV).

Conclusions: Our first experience with T2Bacteria® Panel showed this is highly promising molecular method reducing time to species identification as well as to negative result. It demonstrated high PPA and NPV as well as proving etiology of additional cases otherwise missed with conventional diagnostics.

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