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PRESEPSIN AND PROCALCITONIN FOR SEPSIS DIAGNOSIS AND APPROPRIATENESS OF ANTIBIOTIC THERAPY PREDICTION IN CRITICALLY ILL PATIENTS

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Aim: Evaluation of Presepsin (PSEP) and Procalcitonin (PCT) as early biomarkers of sepsis diagnosis and clinical severity and as early predictors
of appropriateness of empiric antibiotic therapy.

Methods: Prospective, observational study on adult critically ill patients with suspected sepsis. Exclusion criteria were trauma and surgery within the first 72 hours. Age, Charlson Index, APACHE II score, sepsis severity, source of infection, PSEP (PathFas Presepsin, Mitsubishi) and PCT levels (Liaison BRAMS PCT II GEN, Diasorin) on days 1, 2, and 3 were recorded. Appropriateness of antibiotic therapy was based on microorganisms isolated in cultures. Data are median and IQ range, number and percentage. Statistical analysis was performed by the chi-square and the Mann-Withney U tests and by the ROC curve analysis.

Results: Twenty-five patients with sepsis (28%), severe sepsis (40%) and septic shock (32%) due to pneumonia (60%), intra-abdominal (16%), urinary tract (12%) and bloodstream infections (12%) were enrolled. Patients aged 59 (51-70) years, APACHE II score was 18 (14-24) and Charlson Index was 2 (1-3.5).

On day 1, PSEP levels were 1402 (924-2277) pg/mL and PCT levels 1.6 (0.7-17) ng/mL. PSEP levels ≥ 600 and PCT levels ≥ 0.5 were observed in 100% and 75% patients, respectively ($p < .05$).

The diagnostic accuracy for severe sepsis/shock was higher for PSEP (AUC 1, $p < .0001$, cutoff value > 1400, sensitivity 100%, specificity 100%), as compared to PCT (AUC 0.84, $p < .0001$, cutoff value > 0.4, sensitivity 92.3%, specificity 66.7%), with a significant difference between the two AUCs ($p < .001$).

In patients who received first-line appropriated antibiotics (n = 16), PSEP levels dropped from 1701 (1401-2419) pg/mL on day 1 to 1181 (653-1849) on day 2 and to 1009 (571-1511) on day 3 ($p < .05$); PCT levels were 1.3 (0.1-54) ng/mL on day 1, 3.3 (0.5-31.4) on day 2 and 2.35 (0.43-16.8) on day 3.

Conclusions: In critically ill patients with sepsis due to deep-seated infections, PSEP seems to be more useful for early diagnosis, clinical severity definition and early prediction of antibiotic therapy appropriateness, as compared to PCT.

Reference

Masson S, Caironi P, Spanuth E, et al. Presepsin (soluble CD14 subtype) and procalcitonin levels for mortality prediction in sepsis. Crit Care 2014;18:R6.