Do Presepsin (PSEP) and other inflammatory markers correlate with microbiological culture results in sepsis?

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BACKGROUND

Sepsis is defined as life-threatening organ dysfunction caused by inappropriate host response to an infection.[1] Despite the evolution of antibiotic therapies and resuscitation techniques in the management of sepsis, the latter still presents high mortality and morbidity.[2]

The early and accurate diagnosis of sepsis is a constant challenge in clinical practice. Although the C- reactive protein (CRP) and procalcitonin (PCT) have been identified as biomarkers for discrimination between sepsis and other inflammatory states, their accuracy is still much debated.[3-6]

Presepsin (PSEP) is a new biomarker used as an early indicator of infections. Presepsinis a 13kDa fragment derived from the cleavage of CD14, a membrane-anchored glycoprotein of polymorphic monocytes, macrophages and neutrophils. CD14 performs the function of receptor for the lipopolysaccharides (LPS) complex and specific LPS binding protein (LBP). CD14 can bind itself to peptoglycans and others surface structures present in both Gram-Positive and Gram-Negative bacteria. Once tied, the LPS-LBP complex, activates the intracellular inflammatory response of the Toll-Like receptor 4 (TLR4), initiating the inflammatory cascade of the host against the infectious pathogen. Phagocytosis and activity plasma proteases give rise to the formation of the subtype fragment of sCD14 known as Presepsin.[7-9]

METHODS

23 adult patients with a suspected or confirmed sepsis were enrolled before antibiotics start. Biomarkers were evaluated at enrollment (T0), 24 hours (T1), 72 hours (T2) and 7 days (T3). Patients were divided into 2 groups based on positive or negative cultures result. Comparisons were performed with student's T-test and ANalisy Of VAriance (ANOVA) for repeated measures.

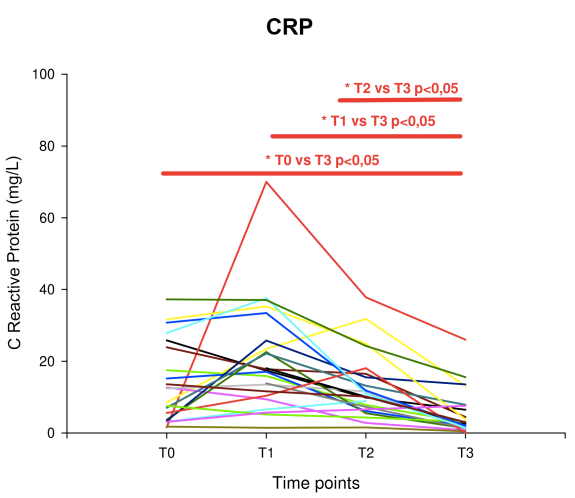
RESULTS

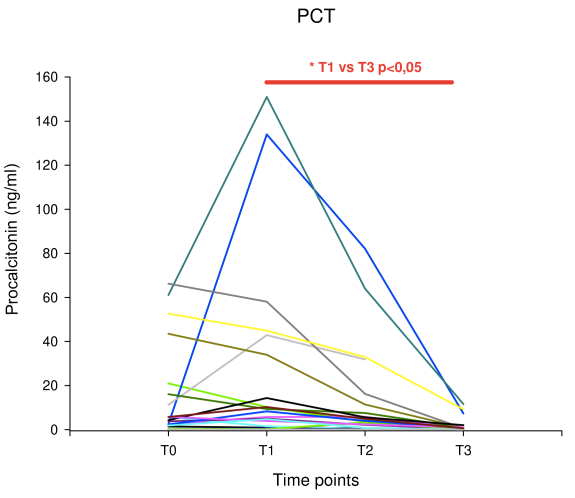
Biomarkers are not different between microbiological cultures groups (positive vs negative) at all timepoints.

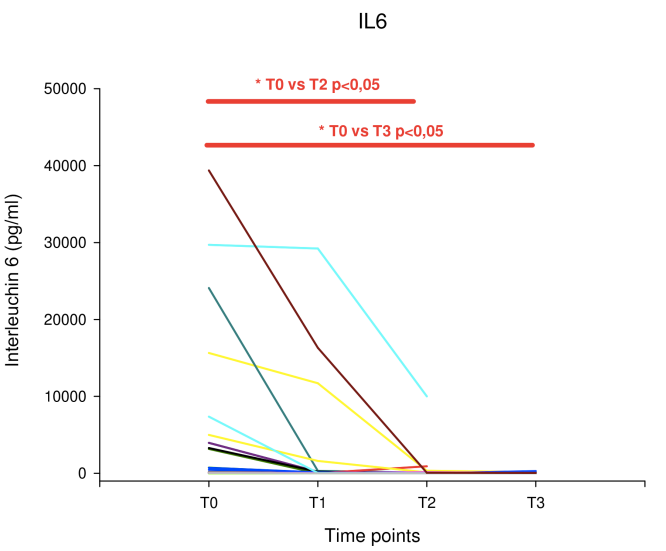
IL-6 is significantly lower at T2 and T3 compared to T0 ($p<0,05$);

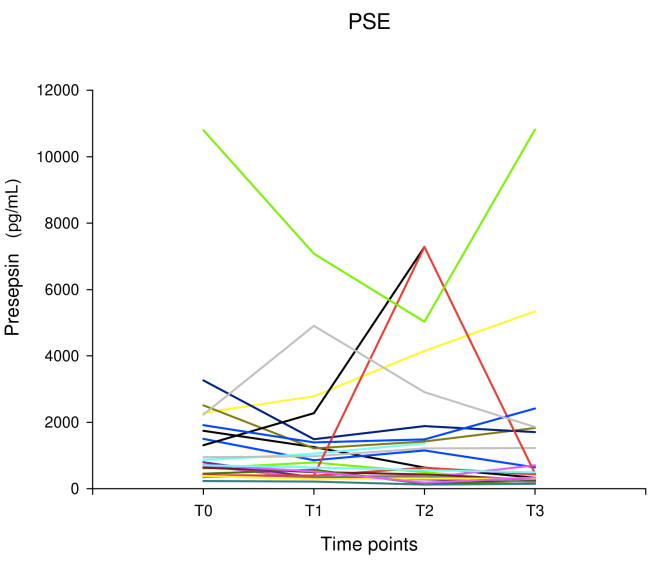
CRP at T3 is significantly lower than at other timepoints ($p<0,05$);

PCT at T3 is significantly lower than at T1 ($p<0,05$); PSEP does not vary significantly overtime.









CONCLUSIONS

In patients with suspected sepsis, inflammatory biomarkers didn't correlate with microbiological culture results. IL-6, CRP and PCT significantly reduced at 7 days after start of antibiotic therapy, while PSEP didn't change significantly.

Unfortunately microbiological cultures may not become positive during sepsis (false negatives) for multiple reasons; thus they do not represent the gold standard for discriminating between septic and non-septic patients. Further studies should that take into account clinical features in order to compare patients with suspected sepsis and patients with other non-septic inflammatory disease (e.g. trauma/burns, etc.) to verify the relationship between Presepsin and sepsis.

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