

## Pancreatin Stone Protein (PSP) as antibiotic therapy marker

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### Background

Sepsis and Septic Shock (SS) affect more than 30 billion people per year in the world with a mean 30-day mortality of 24% (sepsis) and 35% (SS) and represent a major component of health care costs. Prompt diagnosis and treatment are crucial to increase survival rate, as there is an 8% increase in mortality for every hour of delay in antibiotic administration.

Conventional markers such as Procalcitonin (PCT) and C-reactive protein (CRP), used everyday in monitoring sepsis course and the patient's response to antibiotic therapy, are burdened with low sensitivity and specificity.<sup>1,2</sup> A new marker of sepsis, Pancreatic Stone Protein (PSP) has already been demonstrated to have strong sensitivity and specificity for early diagnosis of sepsis and to help prognostic stratification of ICU patients. PSP usage can advance diagnosis up to 72 hours. Furthermore, it was demonstrated to have enough specificity to exclude sepsis in patients with an elevation of CRP and PCT without infective events.<sup>3,4,5</sup>

Aim of this study is to estimate PSP's strength as sepsis evolution and antibiotic-response marker, compared with PCR and PCT.

### Methods

30 adult patients were enrolled in this prospective observational study.

Inclusion criteria: age >18; PSP value > 200ng/mL or increase by 50% from the day before; suspected or document sepsis and/or septic shock during ICU stay.

PCR, PCT, PSP and SOFA score were evaluated at enrollment (T0), 24h (T1), day-3 (T3), day-5 (T5) and day-7 (T7).

We defined:

- Classe SOFA 1 (SOFA score ≤3); classe SOFA 2 (4 ≤ SOFA score ≤8), classe SOFA 3 (SOFA score >8)
- SOFA improvement (T0 vs T7): NO (SOFA unchanged), LOW ( $\Delta$ SOFA <20%), MEDIUM (21% <  $\Delta$ SOFA <50%), HIGH ( $\Delta$ SOFA >51%)

### Results

Among enrolled patients, 17 (57%) developed SS, and 10 (33%) died.

PSP, PCT and CRP showed a decreasing trend, with a significant reduction from T0 (Table 1 and Figure 1):

	PSP	CRP	PCT
T0	355,57 ± 167,33	16,41 ± 8,94	51,63 ± 90,88
T1	343,14 ± 177,01	19,19 ± 10,62	37,74 ± 69,35
T3	231,83 ± 194,26	14,95 ± 11,18	19,08 ± 23,46
T5	198,67 ± 155,63	9,62 ± 7,00	6,68 ± 11,31
T7	229,87 ± 208,1	8,85 ± 6,34	3,53 ± 4,55

Table 1: PSP, CRP and PCT levels at T0, T1, T3, T and T7

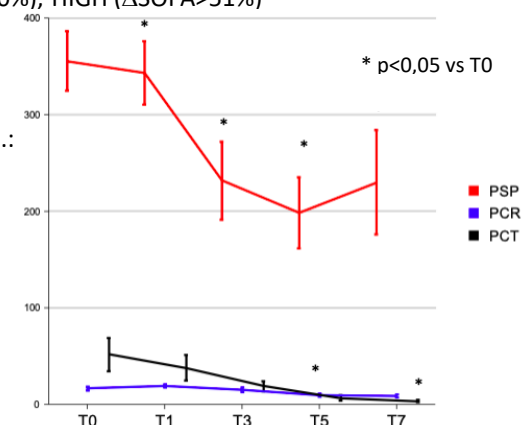


Figure 1: PSP, CRP and PCT trend over time

Stratifying patients according to their severity at T0, PSP was significantly higher in class SOFA 2 and 3 vs class SOFA 1, while PCT was higher in class SOFA 3 vs 2. CRP resulted not-specific and didn't vary significantly between class SOFA (Figure 2).

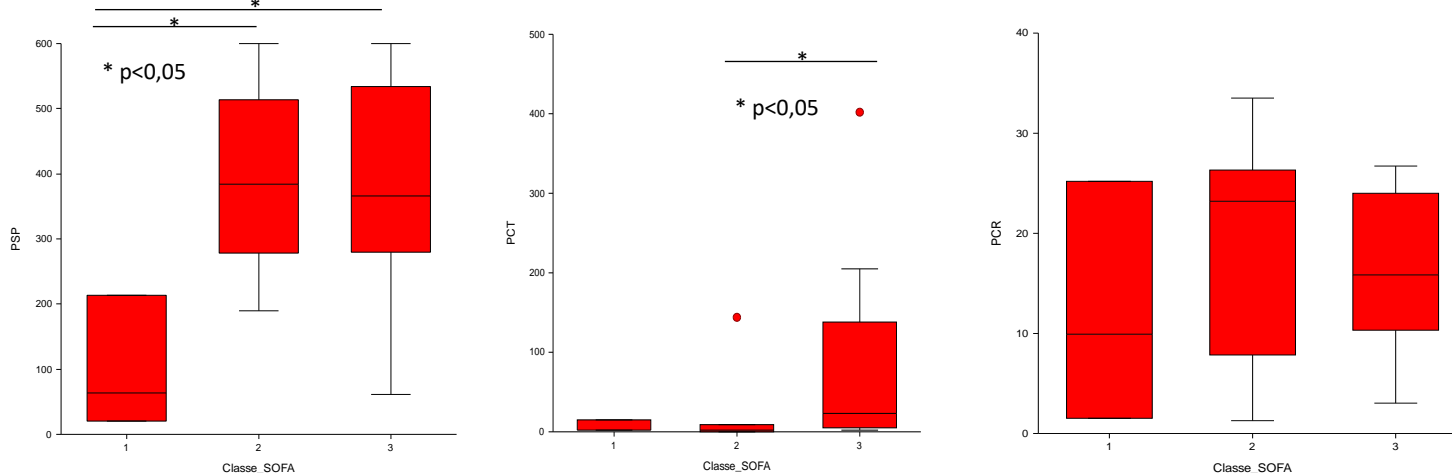


Figure 2: PSP (left), CRP (middle) and PCT (right) stratified as SOFA score at T0.

### Conclusions

PSP, CRP and PCT showed a globally downwards trend during study time, suggesting valid correlation with response to therapy.

PSP decrease is even more noticeable compared with CRP and PCT and it anticipates by at least a day the trend of the other markers.

PSP levels have been higher in the worst patients, and in those who didn't improve, suggesting its use as a prognostic marker on admission.

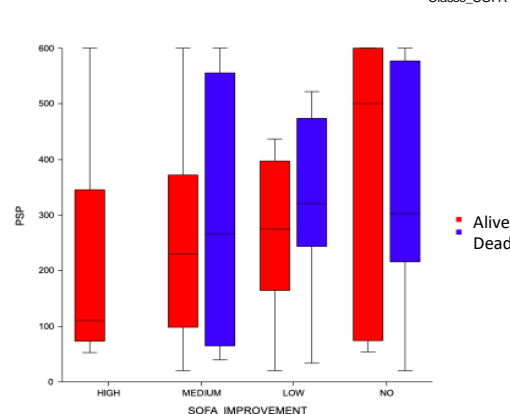


Figure 4: PSP levels in dead and alive patients at T7

PSP levels were significantly higher in patients without clinical improvement than in patients with medium or high improvement (Figure 3). PSP levels were higher in patients who died vs patients who survived (Figure 4).

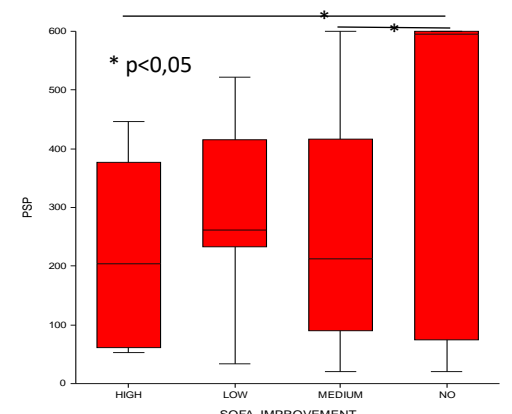


Figure 3: PSP values stratified by SOFA improvement.

### References

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