

Potential role of Pancreatic Stone Protein (PSP) as early marker of bacterial infection in COVID-19 patients

Morri D., Potalivo A., Cappati B., Dominici S., Pazzini A., Di Giandomenico S., 38th Vicenza Course on AKI&CRRT
Fricassè G., Vannini C., Facondini F., Nardi G., Montomoli J.
Department of Anesthesia and Intensive Care, AUSL Romagna, Infermi Hospital, Rimini, Italy



Background: Sepsis is a life-threatening condition that needs immediate diagnosis and treatment to maximize the chances of survival. Bacterial superinfection is a severe and frequent complication among COVID-19 patients and its diagnosis is challenging. Previous reports suggested that Pancreatic Stone Protein (PSP) may be a sensitive marker for detection of sepsis in critically ill patients [1-3]. We report a case series of three COVID-19 patients admitted to our intensive care unit (ICU) that were diagnosed with sepsis and received daily monitoring of PSP levels.

Methods: we monitored PSP, procalcitonin (PCT), and C-reactive protein (CRP) levels in three COVID-19 patients admitted to our ICU between the 26th of August and the 14th of October 2020. Microbiological sampling and antibiotic treatment were performed according to the ward organization and whenever a clinical suspect for infection was present. Positive cultures and antibiotic treatment were retrieved from clinical charts. Patients were followed from the day of ICU admission up to a maximum of 20 days.

Results: Patient 1 was a male, age 55 years, overweight with no other comorbidity. He was admitted to the ICU with non-invasive ventilation and was already undergoing treatment with Ceftriaxone that was interrupted on day 7. On day 2 he was intubated. Piperacillin/tazobactam was started on day 12 for suspected hospital acquired pneumonia. PSP levels markedly increased on day 10 with no significant changes in CRP and PCT levels. Bronchospirote was performed on day 13 with isolation of *Klebsiella pneumoniae* with CFU > 10⁶ (Figure 1). Patient 2 was a 70 years old man, with mild emphysema and diabetes. At ICU admission PSP level was 287 ng/ml and he was not receiving antibiotic treatment. His conditions rapidly worsened requiring intubation and characterized by the development of a severe septic shock (Figure 2). CRP levels markedly raised between 48 and 72 hours after the detection of increased PSP with only mild increase of PCT. Patient 3 was a male, 78 years old without comorbidities. Similarly to patient 2, on the day of ICU admission PSP level was elevated and he was receiving piperacillin/tazobactam. After 48-72 hours, CRP levels increased with no significant changes of PCT. Endotracheal aspirate was collected on day 3 and it was positive for *Ps. aeruginosa* (Figure 3).

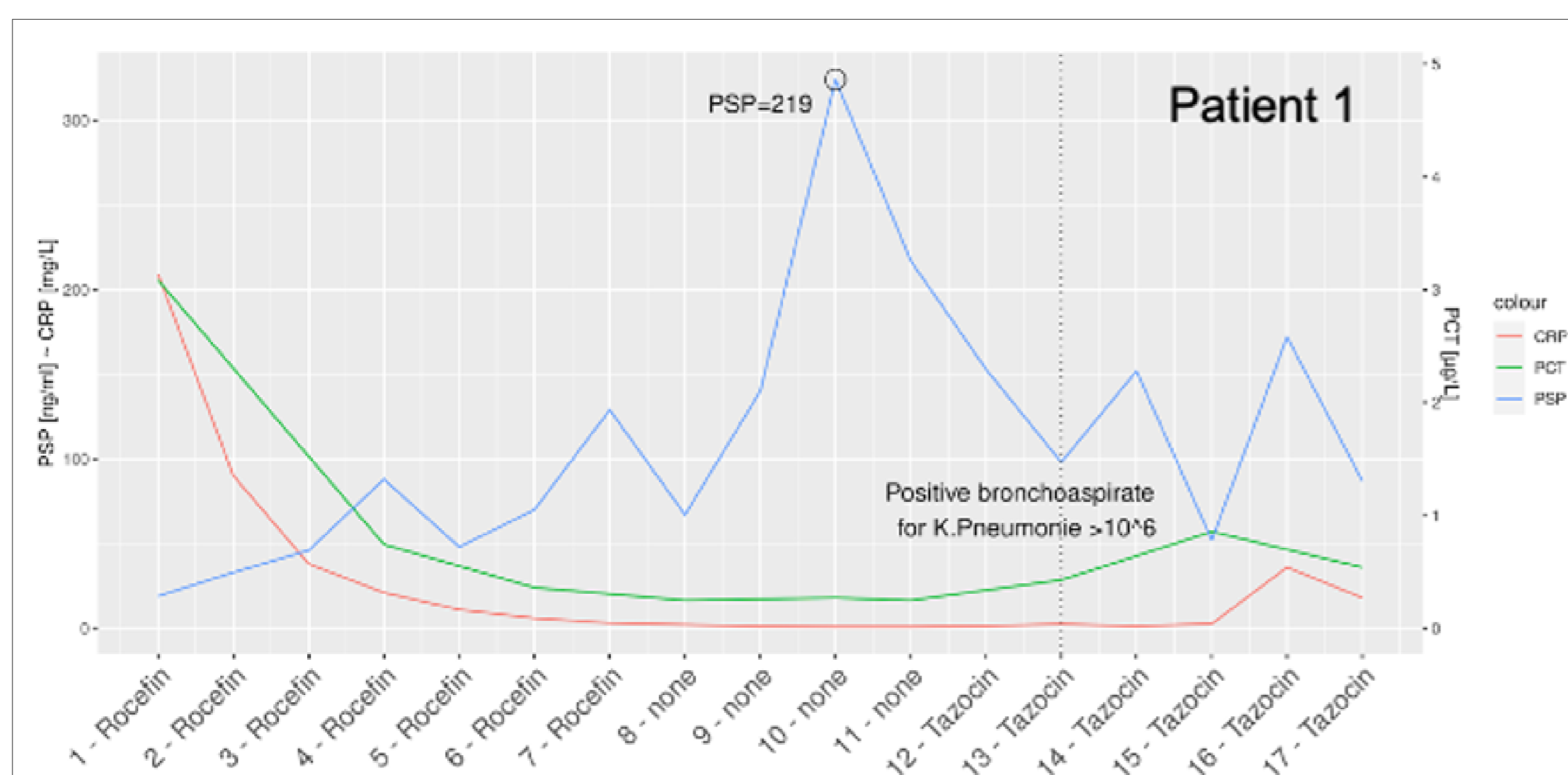


FIGURE 1

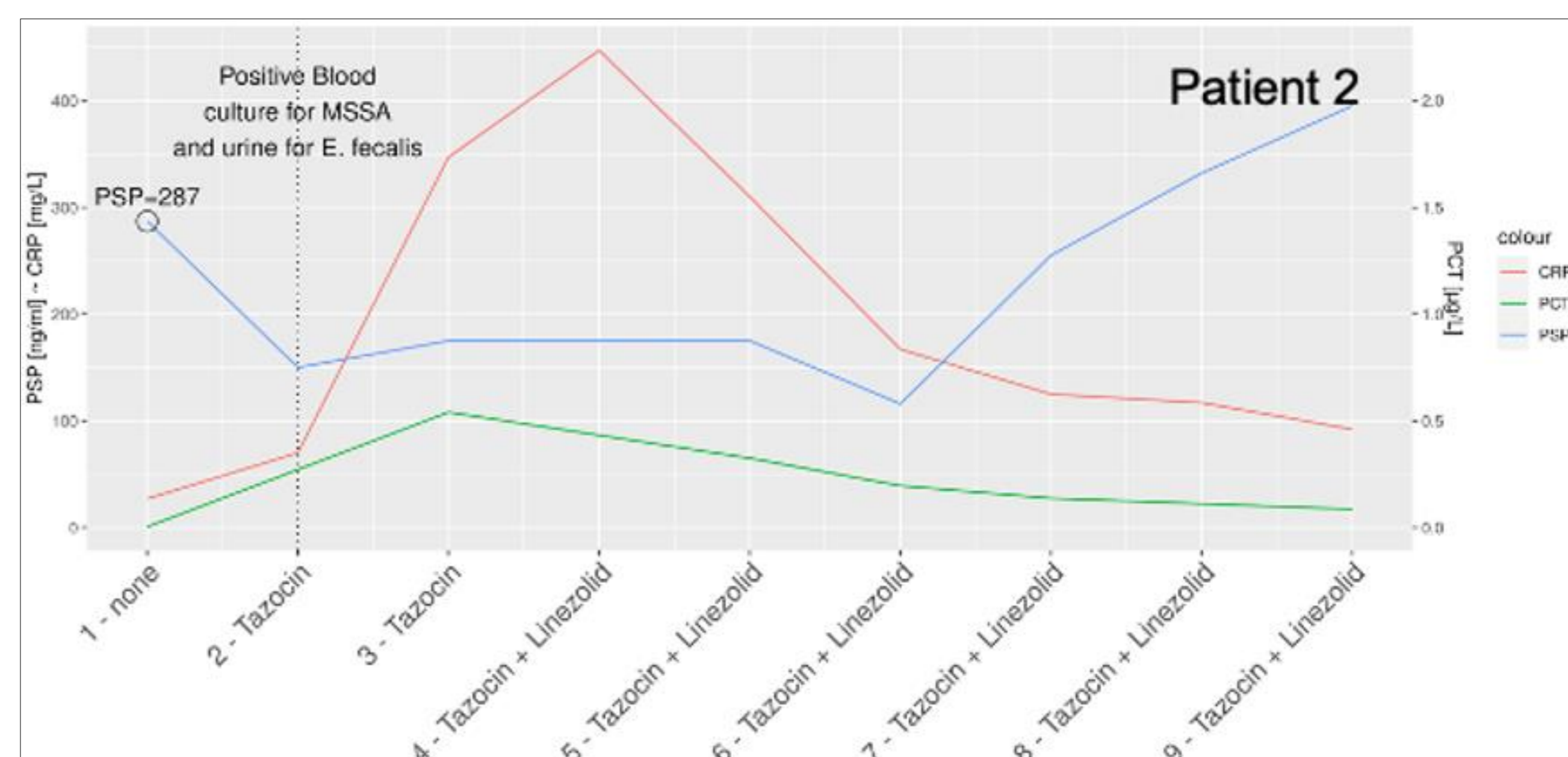


FIGURE 2

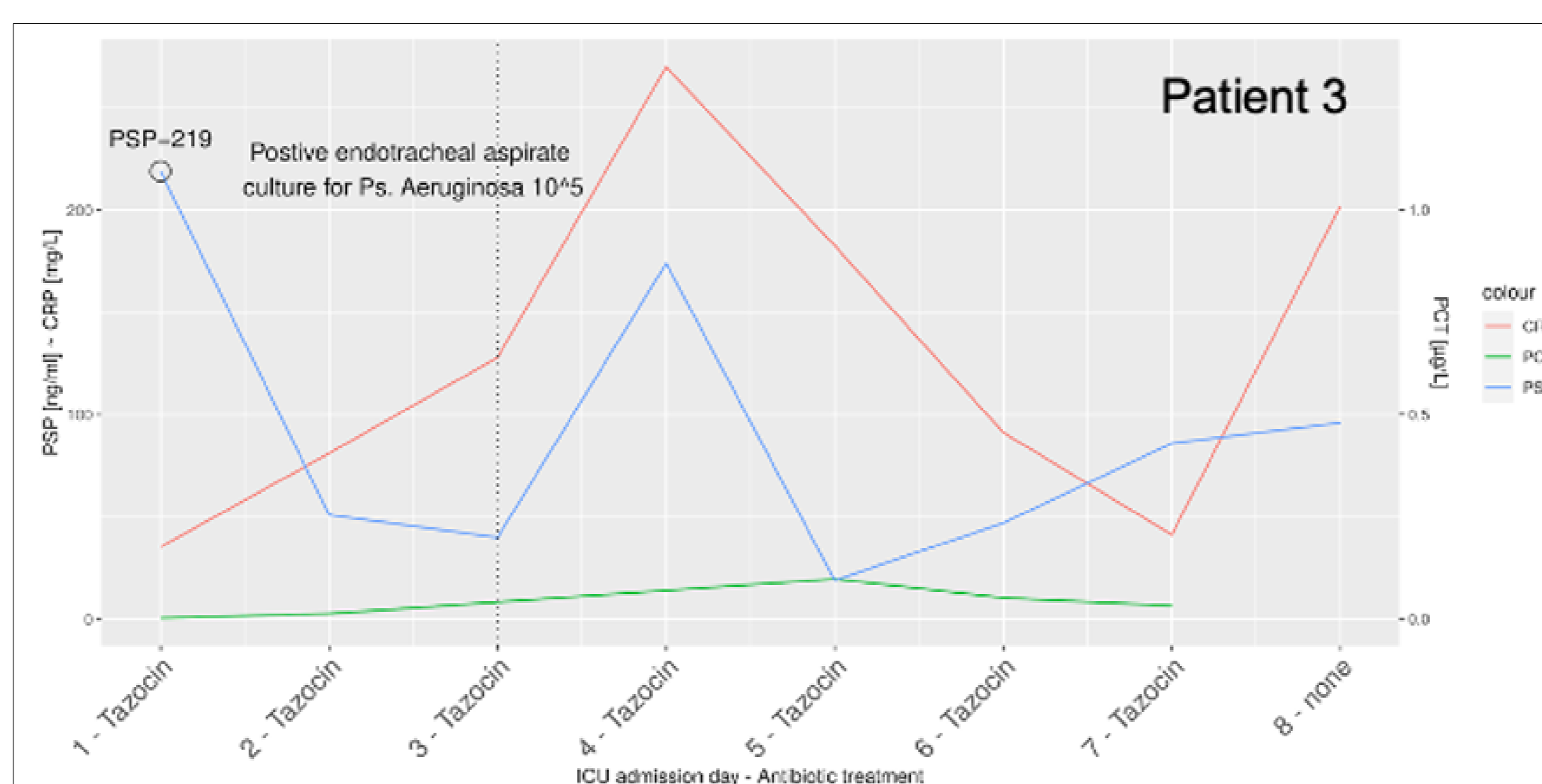


FIGURE 3

Conclusion: Our findings suggest a potential role of PSP as early marker of sepsis in critically ill COVID-19 patients. Daily PSP monitoring may anticipate the inception of an appropriate treatment in COVID-19 patients with a septic complication in comparison with the actual laboratory markers. Further studies are needed to confirm our hypothesis.

References:

1. Que Y., et al. Pancreatic stone protein as an early biomarker predicting mortality in a prospective cohort of patients with sepsis requiring ICU management. *Critical Care* 2012.
2. Llewlyn M.J., et al. Sepsis biomarkers in unselected patients on admission to intensive or high-dependency. *Critical Care*, 2013.
3. Eggimann Ph., et al. Measurement of pancreatic stone protein in the identification and management of sepsis. *Biomark Med*, 2019.