

Value of Serum Cholinesterase Activity in the diagnosis of septic shock due to bacterial infections

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Introduction

- Sepsis is a leading cause of mortality in critically ill patients despite the use of new antibiotics and resuscitation therapies.
- Up to this day, many biomarkers of inflammation and sepsis are studied. Procalcitonin (PCT) and C-reactive protein (CRP) have been most widely used,
- **Objective:** to investigate whether serum cholinesterase (SchE) activity could be helpful for the diagnosis of septic shock.

Patients and methods:

- We conducted a prospective single-blinded study conducted in intensive care unit of university hospital.
- Patients were classified as having cardiogenic shock, septic shock or haemorrhagic shock.
- Moreover, we have included a control group without hemodynamic instability and without sepsis.
- For all included patients, Blood samples were obtained (Serum ChE, procalcitonin and CRP) at the same time.

Results:

- The comparison of sepsis marker between all groups showed that the mean value of PCT and CRP was significantly higher in patients with septic shock group.
- However, Serum ChE activity was significantly lower in this last group. (Table 1)

Table 1: Value and comparison of biological markers of sepsis between all groups

Biological markers of sepsis	Control group (N=13)	Septic Shock group (N= 18)	Cardiogenic Shock group (N= 16)	Hemorrhagic shock group (N= 13)	p
Serum ChE activity (UI/I)	5687±1819 (5723)	2923±931 (2762)	5220±1968 (5410)	5255±1504 (4734)	<0.001
Procalcitonin (ng/ml)	0.92±1.1 (0.2)	25.8±36 (5.9)	2.6±3 (2)	22±33 (3)	<0.001
CRP (mg/l)	86.5±64.5 (76)	182±124 (159)	93±68 (82)	137±88.2 (95)	0.011

To predict the positive diagnosis of septic shock, biological marker of sepsis were compared. (Table 2)

Table 2. Evaluation of biomarkers of sepsis for the diagnosis of septic shock

Biological markers of sepsis	Sensitivity	Specificity	Negative predictive value	Positive predictive value
Serum ChE activity (4000UI/l)	78%	89%	97%	65%
Procalcitonin (2.59 ng/ml)	72%	62%	86%	50%
CRP (135 mg/l)	61%	74%	70%	30%

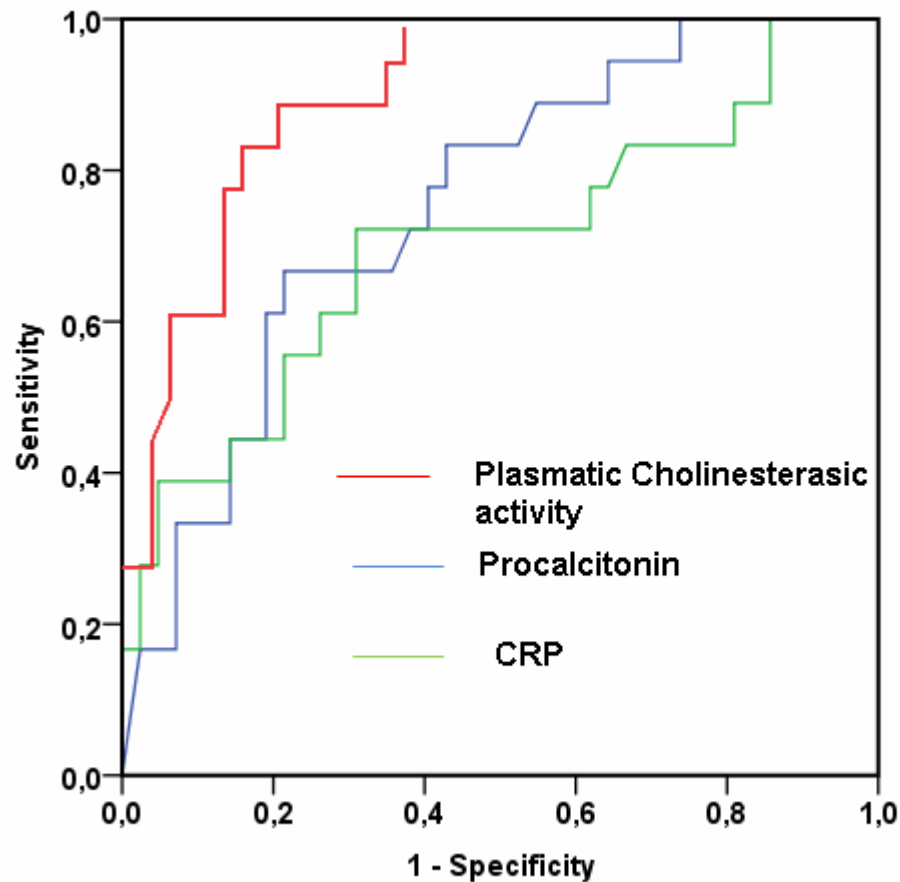


Figure 1: The receiver-operating curves of ChE, CRP and PCT to predict septic shock (plasmatic ChE: area under the curve=0.89; PCT: area under the curve=0.75; CRP: area under the curve=0.70)

Discussion/Conclusion

- Our Study showed that low value of SChE activity can be used as a reliable diagnostic marker to detect septic shock. Moreover, ChE activity was found to be the best marker for the diagnosis of septic shock in comparison with PCT and CRP.
- In fact a serum ChE activity ≤ 4000 UI/l was significantly associated with the diagnosis of septic shock.
- Moreover, although that low value of SChE activities was found to be well correlated with the diagnosis of septic shock, it was not associated with a poor outcome (death) in multivariate analysis.