

Procalcitonin- Marker of sepsis in trauma patients

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Abstract

The present study was done to evaluate the predictive value of Procalcitonin in post traumatic sepsis patients. It is an age and sex matched prospective study. A total of 100 patients between 20 and 50 years who were admitted in emergency department following road traffic accidents were included in the study. Serum Procalcitonin level compared between Group A (post traumatic patients with sepsis) and Group B (post traumatic patients without infections). The mean concentration of serum PCT in Group A and Group B were 3.96 ± 1.11 ng/ml and 0.24 ± 0.21 ng/ml respectively. Difference of PCT concentration between these two groups was found to be statistically significant (P Value-0.001).

Keywords: Procalcitonin, Sepsis.

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1. Introduction

In major road traffic accidents, sepsis remains the main cause of mortality worldwide. In these patients, early diagnosis and treatment can improve prognosis. Though bacterial culture remains the gold standard test for diagnosing sepsis, the results are often delayed [1]. Early diagnosis and prompt antimicrobial therapy are important in the treatment of sepsis.

Procalcitonin (PCT) belongs to calcitonin superfamily with a molecular weight of 13 KD. It is a peptide with 116 amino acids. During inflammation and bacterial infections, the level of Procalcitonin increases more in the blood [2-6]. PCT rises before C-reactive protein in acute bacterial infections [2].

The present study was conducted to evaluate the role of PCT as a predictive marker of sepsis in trauma patients.

2. Material and methods

The study was conducted at Department of Biochemistry- Tagore Medical College from November 2017 to April 2019. It is an age and sex matched prospective study.

The study includes 100 patients who were admitted in the emergency department following major road traffic accidents with multiple injuries, with or without head injury. Patients were divided into two groups. Group A includes post-traumatic patients who developed sepsis later on. Sepsis proved by clinical presentation with positive blood culture. Group B includes post-traumatic patients with no infections. All were between the age group of 20 to 50 years. Patients with a recent history of surgery, known case of hypertension, Renal failure, Gastrointestinal disease, Diabetes mellitus, and malignancy were excluded from the study.

Blood samples were withdrawn from the patients after obtaining informed consent. The levels of PCT in the serum of the patients were estimated using ELISA technique.

3. Results

The statistical analysis was done using student 't' test.

Serum PCT concentrations were compared between Group A and Group B. The mean concentration of serum PCT in Group A was found to be 3.96 ± 1.1 ng/ml.

The mean PCT concentration in Group B was 0.24 ± 0.21 ng/ml. The difference in PCT concentration between these two groups was found to be statistically significant (P Value-0.001).

Table1: Comparison of serum PCT level

	Mean \pm SD
Group A	3.95 ± 1.11 ng/ml
Group B	0.24 ± 0.21 ng/ml

P-Value is 0.001 (Statistically significant)

4. Discussion

Sepsis is the most common cause of death in non-coronary intensive care units. Following trauma both humoral and cell-mediated immune response is depressed. Anti-inflammatory cytokines are released which in turn suppress the immune system and increase the risk of secondary infections [7]. In sepsis-associated immune suppression, enhanced apoptosis, especially of B cells, CD4+Tcells, and follicular dendritic cells occur. In the last stage of sepsis, multi-organ dysfunction and ultimate death occur [8].

Many researchers have explored the predictive value of biomarkers like C-reactive protein, Interleukin6, IL-10, Neopterin, IL-1, IL-18, Kynurenine, Kynurenine-tryptophan ratios, soluble thrombomodulin, etc in post-traumatic sepsis but the results are unsatisfactory [1,7].

PCT is produced by the C-cells of thyroid under the regulation of calcitonin gene [9]. During inflammation, bacterial endotoxins and inflammatory cytokines stimulate the expression of PCT in extrathyroidal tissues. Several studies have shown the superiority of PCT over traditional markers for diagnosing sepsis [10-12].

In the present study serum PCT level increases significantly in sepsis patients compared to trauma patients with no infections. Hence PCT serves as a better marker for predicting sepsis in post-trauma patients.

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