THE DIAGNOSTIC VALUE OF INTENSIVE CARE INFECTION SCORE IN COMPARISON TO PROCALCITONIN LEVEL AND CRP IN SEPTIC ICU PATIENTS

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INTRODUCTION

Sepsis is defined as life-threatening organ dysfunction caused by a dysregulated host response to infection. In this new definition the concept of non-homeostatic host response to infection is strongly stressed while the SIRS criteria have been removed.

However, the diagnosis of sepsis and evaluation of its severity is complicated by the highly variable and non-specific nature of the signs and symptoms of sepsis. From this point biomarkers have an important place in the process of early diagnosis and stratification of the severity of sepsis and can differentiate between infectious and non-infectious causes of systemic inflammatory response

The intensive care infection score (ICIS) a novel score for prediction of sepsis comprised five blood-cell derived parameters that characterize the early innate immune response which are: The mean fluorescence intensity of segmented neutrophils (SNFI), difference in hemoglobin concentration between newly formed and mature red blood cells (dCHC), total segmented neutrophil count (SN), antibody secreting lymphocyte count (ASL) and immature granulocyte count (IG).

A high ICIS increases the likelihood of infection when suspected and a low ICIS decreases it. This may help the clinician in ordering extra tests or starting empirical antibiotics.

AIM OF THE WORK

The aim of the work was to assess the diagnostic value of intensive care infection score in comparison to procalcitonin level and CRP in septic ICU patients

SUBJECTS AND METHODS

The study will be carried out on 96 Adult patients of both sexes who were admitted to Critical Care Medicine Department in Alexandria Main University Hospital with or without the need of mechanical ventilation.

Approval of the Medical Ethics Committee of Alexandria Faculty of Medicine and an informed consent from the patients or next of kin was taken before conducting the study.

Patients who admitted to Medical ICU who are mechanically ventilated or not are classified into two groups of increasing likelihood of infection and invasiveness:

Group 1: Patients admitted without suspected infection.

Group 2: Patients admitted with suspected infection according to surviving sepsis campaign (sepsis-3).

Inclusion criteria: - Age more than 18 years and less than 80 years.

- Patients admitted with suspected infection according to surviving sepsis campaign (sepsis-3).

Exclusion criteria: - Pregnant female patients, pediatric patients.

- Patients who use immune-suppressive, immunomodulatory and chemotherapy.

- Patients with abnormal hematological index which is defined as: anemia (baseline hemoglobin ≤ 11.5 g/dL for women or ≤ 13.5 g/dL for men); leucopenia (WBC≤ 4.0×10^9/L); and/or thrombocytopenia (platelet count ≤ 150×10^9/L).

Methods: A cross-sectional study was conducted on 96 Adult patients of both sexes who were admitted to Critical Care Medicine Department in Alexandria Main University Hospital with or without the need of mechanical ventilation. An informed consent from the patients or next of kin was taken before conducting the study. Patients who were admitted to medical ICU either mechanically ventilated or not, was classified in to two groups of increasing likelihood of infection based on surviving sepsis campaign (sepsis-3). The ICIS calculation from the first blood measurement on ICU admission acquired at the same time as CRP and PCT were evaluated, was used. Intensive care infection score (ICIS) was calculated from whole blood samples drawn (2.5ml of either venous or arterial blood, collected in ethylene diaminetetra-acetic acid EDTA tubes) using a fully automated routine fluorescence hematology flow cytometer (Sysmex). ICIS more than 3 from the first day calculation was recorded as a positive score; ICIS less than or equal 3 was recorded as a negative score.

At the same time, venous or arterial blood was collected into heparin plasma tubes and immediately sent to the laboratory to measure plasma PCT and CRP after being centrifuged for 10 min at 4°C. CRP <10 mg/L or PCT <0.1ng/ml was recorded as no infection suspected; CRP>10mg/L or PCT >0.1ng/ml was recorded as infection is suspected.

RESULTS

Table 1: Sensitivity, specificity and accuracy of Intensive Care Infection Score (ICS), procalcitonin and CRP in predicting of suspected infection.

Makers	Area	Cut off value	Asymptotic Sig.[b]	Asymptotic 95% Confidence Interval	
				Lower Bound	Upper Bound
(ICS)	.851	3	0.0001*	.652	.851
	Sensitivity			86.0	
	Specificity			80.0	
	PPV			84.0	
	NPV			88.0	
	Accuracy			81.0	
Procalcitonin	.631	0.1	0.05*	0.477	0.706
	Sensitivity			66.0	
	Specificity			62.0	
	PPV			65.0	
	NPV			60.0	
	Accuracy			63.0	
CRP	.78	10	0.036*	0.683	0.873
	Sensitivity			82.0	
	Specificity			77.0	
	PPV			81.0	
	NPV			78.0	
	Accuracy			80.0	

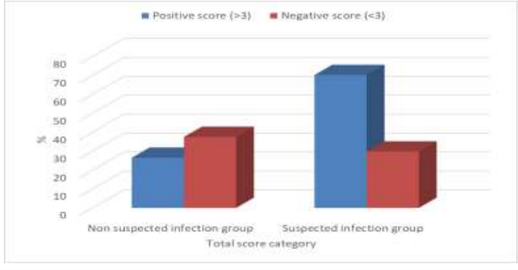

Figure 1: Comparison between the two studied groups regarding Total score category..

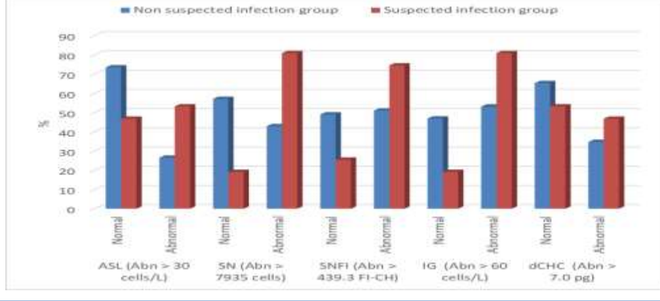

Figure 2: Comparison between the two studied groups regarding different ICIS markers.

CONCLUSION

In conclusion, the present study demonstrated the possibility to use ICIS measurement routinely in ICU patients, in general. ICIS may provide a reliable marker for the timely identification of infection. Procalcitonin show a high sensitivity, specificity and accuracy more than CRP in prediction infection in septic ICU patients. Finally, the use of ICIS as a decision guide may reduce antibiotic exposure and the associated risks of adverse effects, and in addition reduce antibiotic resistance, without putting patients at risk.