PREDICTORS OF AKI AND MORTALITY IN PATIENTS WITH SEPSIS

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INTRODUCTION

Acute Kidney injury (AKI) is a common complication of sepsis in critically ill patients.

Elevated levels of Endogenous Ouabain (EO), an adrenal stress hormone with hemodynamic effect, contributes to the development and maintenance of AKI in critically ill patients.

The aim of this study was to assess the role of EO and other markers to predict AKI and mortality in patients with sepsis and septic shock.

METHODS

177 patients diagnosed with sepsis or septic shock admitted in non-intensive care units were enrolled in 2010-2013 and 2019-2020.

In a subgroup of 53 patients EO was measured through a venous sampling in 3 different times:
- T0: hospital admission
- T1: 24 h
- T2: 48 h

We assessed the role of different clinical and biochemical markers to predict AKI and mortality in patients with sepsis.

RESULTS

The incidence of AKI was 70,1%.

Respiratory distress (p=0,005) and SOFA score at the onset of sepsis (p=0,007), resulted valid clinical predictors of AKI

Lactate levels correlate well with SOFA (p-value <0,0001) and mortality particularly when the initial values are > 2 mg/dL (p-value 0,003).

AKI seems not to predict mortality (p=0,13).

The initial EO value seems to predict mortality (p-value 0,02) but not the development of AKI, however patients in AKI-stage 3 show persistently higher levels of EO.

	p-value	Exp(B)	CI 95%
Age	0,479	0,981	[0,93-1,03]
Sex	0,806	0,876	[0,30-2,52]
WBC (10³/ml)	0,009	1,092	[1,02-1,16]
Serum lactate (mg/dL)	0,681	1,039	[0,86-1,24]
Serum Creatinine (mg/dL)	0,384	1,616	[0,54-4,76]
SBP > 100 mmHg	0,050	1,354	[1,01-1,95]
SOFA score	0,004	1,525	[1,14-2,03]
PaO₂FiO₂	0,014	1,900	[1,14-3,16]

Multivariate analysis to evaluate the role of different anthropometric, clinical and biochemical markers to predict the risk of severe AKI (stage 2-3 according to KDIGO 2012). WBC, white blood cells, SBP, systolic blood pressure.
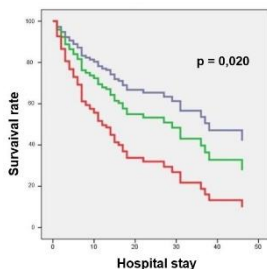
Kaplan-Meyer analysis comparing survival rate based on three different stages of SOFA score. The blue curve represents stage 1 (SOFA 2-4), green curve represents stage 2 (SOFA 5-8) and red curve is for stage 3 (SOFA 9-16).
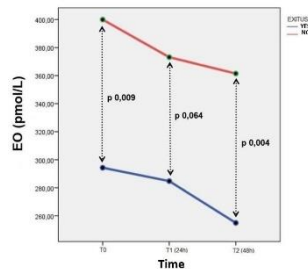
ANOVA test evaluating the role of EO to predict mortality in patients with sepsis and septic shock. The mean EO value at onset and at T2 is higher in patients with adverse outcome.

CONCLUSION

✓ Hypotension, SOFA score and respiratory distress at the onset of sepsis, are the main predictors of AKI while, serum lactate and SOFA score are the major predictors of mortality.

✓ EO may have a role in persistence of renal damage in conditions of severe hemodynamic alterations such as presence of septic shock. Its serum level is able to identify patients with more severe presentation and increased risk of early mortality and therefore, it may improve our ability to predict mortality in patients with sepsis.

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