The Role of Urinary Ngal as Diagnosis and Prognosis Predictor of Acute Kidney Injury Associated with Sepsis in Patients Admitted to the Emergency Room

Daniela Ponce, Hong Si Nga, Adriana Paes, Pamela Medeiros, Andre Balbi

Botucatu School of Medicine, UNESP, São Paulo, Brazil

Introduction

- AKI associated with sepsis remains a major challenge in intensive care because of its common occurrence and unacceptably high mortality. It is known that the creatinine is not the ideal marker of AKI and NGAL is a promising biomarker for the early AKI detection.
- This study aimed to assess the effectiveness of urinary NGAL (u) as diagnosis and prognosis predictor of AKI associated with sepsis in patients admitted to the emergency room (ER).

Methods

- For each patient was performed protocol with clinical and laboratory data. Dosage of u NGAL was performed at the first 24h and between 24 and 48 hours after admission. Results were presented using descriptive statistics.
- This study received financial support from the Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP).

Results

- 125 septic patients admitted to the ER was studied prospectively during the period December 2012 to November 2013.

- Age was 67.5 15.9 years, males (59.2%), diabetes, hypertension and CKD in 28.9, 49.5 and 9.3 % respectively. Severe sepsis was present in 40% of patients and shock septic in 52%. Prevalence of AKI associated with sepsis was 72 % and mortality rate was 45.6 %.

- AKI was present in 90 patients, of whom 66 were diagnosed on admission by the AKIN criteria and 24 developed AKI during hospitalization. AKI patients had uNGAL higher than patients without AKI. uNGAL already proved high in the first 24 hours of admission of patients who had not AKI at this moment , but later , when compared the population who did not develop AKI (2.24 0.22 vs. 1.59 0.21, p = 0.04).

Table 1- Clinical characteristics of patients with and without AKI

Characteristics	AKI	No AKI	p
N	35	90	
Age (years)	63±14	72±15	0.048
Baseline Cr (mg/dl)	0.6±0.2	0.8±0.3	0.003
MAP on admission (mmHg)	73±16	69±13	0.04
APACHE 2	16±4.8	28±7.7	0.002
Urine output (mL)	1450±382	832±299	0.01
Fluid balance (mL)	699±153	984±299	0.03
Vasoactive drugs (%)	24	61	<0.001
Mechanical ventilation (%)	5	22	<0.001
Mortality (%)	24	48	<0.001
uNGAL in first 24h	1.59±0.22	4.55±0.98	0.002
u NGAL between 24 and 48h	0.74±0.12	4±0.77	<0.001

Table 2- Clinical characteristics of survival and non survival

Characteristics	Non-survival	survival	p
N	68	57	
Age (years)	67.2±14	67.9±15	0.43
Baseline Cr (mg/dl)	0.78±0.16	0.81±0.26	0.09
MAP on admission (mmHg)	77±16	64±13	0.02
APACHE 2	20.6±4.8	28±7.7	0.003
AKI	62.4	79	0.004
ATN-ISS	0.37±0.11	0.56±0.18	0.008
Urine output (mL)	1340±382	922±212	0.01
Fluid balance (mL)	315± 113	897± 219	0.04
Vasoactive drugs (%)	36	73	<0.001
Mechanical Ventilation (%)	3.5	36.7	<0.001
Dialysis (%)	4.8	15.9	0.005
uNGAL in 24h	3.88±0.71	5.42±0.98	0.02
u NGAL betwwen 24 and 48h	3.21±0.57	3.1±0.51	0.51

Conclusion

- Preliminary results indicate that uNGAL in the first 24 h is early predictor of AKI diagnosis and mortality in septic patients admitted to ER.