

DETERMINATION OF NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN AS EARLY MARKER OF ACUTE KIDNEY INJURY IN ACUTE PANCREATITIS



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OBJECTIVES

In patients with acute kidney injury (AKI) in the course of acute pancreatitis (AP) the mortality rate reaches 70-80%. Serum NGAL (sNGAL) is a 25kDa protein, freely filtered by the glomerulus, and physiologically almost completely absorbed by the proximal tubule. Urinary NGAL (uNGAL) expression significantly increases in the distal tubule in response to renal ischemia or toxic injury [1]. The aim of this study was to analyse the diagnostic value of sNGAL and uNGAL as prognostic markers of kidney injury at the early phase of AP.

RESULTS

At the early phase of AP, 11 patients (17%) developed AKI according to the KDIGO criteria. AKI stage 1 was diagnosed in 10 patients and stage 2 in one. Patients with AKI had significantly higher sNGAL and uNGAL at 24 hours as compared to those without AKI [median (IQR): 276 (229-427) vs. 105 (68-137) ng/ml and 550 (73-856) vs. 26 (145-44) ng/ml, respectively; $p < 0.001$]. In addition, significantly higher sNGAL and uNGAL concentrations were observed in patients with severe AP and BISAP ≥ 3 ($p < 0.001$). Both sNGAL and uNGAL at 24 hours correlated significantly with the increase in serum creatinine during the first 72 hours of AP ($R = 0.43$, $R = 0.45$; $p < 0.001$). Also, sNGAL and uNGAL positively correlated with CRP and WBC count ($p < 0.001$). In addition, the concentrations of sNGAL were significantly correlated with the duration of hospital stay ($p < 0.002$) [Table 1].

METHODS

The study group consisted of 65 patients (34 men and 31 women), aged 62.2 ± 16.0 , treated in the surgery department during the first 72 hours after the onset of the AP. We analysed the correlations between serum and urine NGAL concentrations and clinical and laboratory parameters used for the assessment of AKI, as well as AP severity according to the revised Atlanta classification (2012). AKI was diagnosed according to KDIGO guideline. The sNGAL concentration was measured by BioVendor ELISA kit and uNGAL using Abbott ARCHITECT NGAL assay.

Table 1. Simple correlations between sNGAL and the selected variables at admission and on days 2 and 3 of hospital stay.

Variable	At admission		Day 2		Day 3	
	R	p	R	p	R	p
Duration of hospital stay	0.38	0.002	0.54	<0.001	0.43	<0.001
BISAP score	0.39	0.002	0.47	<0.001	0.55	<0.001
WBC	0.46	<0.001	0.64	<0.001	0.58	<0.001
CRP	0.66	<0.001	0.70	<0.001	0.60	<0.001
Fibrinogen	0.51	<0.001	0.40	<0.001	0.34	0.005
Albumin	-0.43	<0.001	-0.57	<0.001	-0.60	<0.001

CONCLUSIONS

Determination of both sNGAL and uNGAL is useful in diagnosis of AKI developing in the early phase of severe AP. In patients with sNGAL above 137ng / ml and uNGAL above 44 ng/mL on the first AP day, treatment should be more intensive to prevent AKI.

REFERENCES

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