COMPARING PLATELET TO LYMPHOCYTE RATIO & NEUTROPHIL GELATINASE ASSOCIATED LIPOCALIN IN PREDICTING OUTCOMES IN CRITICAL PATIENTS WITH ACUTE KIDNEY INJURY

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INTRODUCTION

Acute kidney injury (AKI) is clinically defined as acute decrease in glomerular filtration rate (GFR) reflected by rising serum creatinine (SCr) and/or drop in urine output over a given period of time. The incidence rates of AKI are affected by both the definition of AKI used and the studied population.

Neutrophil gelatinase-associated lipocalin (NGAL) also referred to as lipocalin 2, It belongs to the Lipocalin glycoproteins family.

Platelets and lymphocytes (PLR) plays critical roles in the inflammatory process. It is novel inflammatory factor that has received research attention recently, as it may act as an indicator of inflammation. (NGAL) has been recently highlighted as a biomarker for acute kidney diseases.

AIM OF THE WORK

The aim of the work was to compare accuracy of platelet-to-lymphocyte ratio to serum gelatinase associated lipocalin as a predictor of the morbidity and mortality in critically ill patients with acute kidney injury.

SUBJECTS AND METHODS

This study was carried on sixty adult patients of both sex who were admitted to the Critical Care Medicine Department in Alexandria Main University Hospital with diagnosis of AKI.

Serum NGAL was measured for all patients on admission and PLR was calculated for all patients.

Patients were followed up for 28 days and the following were recorded; length of ICU stay, need for vasopressors, need for mechanical ventilation, need for renal replacement therapy and 28-day mortality.

Patients were classified into two groups according to mortality; Group I (survival) & Group II (non-survival).

RESULTS

Table (1): Comparison between the two studied groups according to NGAL

NGAL	Mortality		U	p
	Group I (n = 41)	Group II (n = 19)		
Min. – Max.	89.0 – 299.0	123.0 – 290.0		
Mean ± SD.	155.3 ± 46.73	202.2 ± 44.79	199.50*	0.003*
Median (IQR)	159.0(110.0 – 190.0)	189.0(178.0 – 240.0)		

Table (2): Comparison between the two studied groups according to PLR

	Group I (n = 41)		Group II (n = 19)		Test of sig.	P
	No.	%	No.	%		
PLR range						
<90	7	17.1	3	15.8	χ²= 12.092*	0.002*
90 – 310	26	63.4	4	21.1		
>310	8	19.5	12	63.2		
PLR prognosis						
Poor	15	36.6	15	78.9	χ²= 9.320*	0.002*
Good	26	63.4	4	21.1		
PLR						
Min. – Max.	8.47 – 2404.9		68.18 – 754.8			
Mean ± SD.	340.9 ± 538.7		348.5 ± 214.2		U= 264.5*	0.047*
Median (IQR)	151.8(97.0 – 268.7)		326.2(180.4 – 432.0)			

Table (3): Relation between PLR range and morbidity (n = 60)

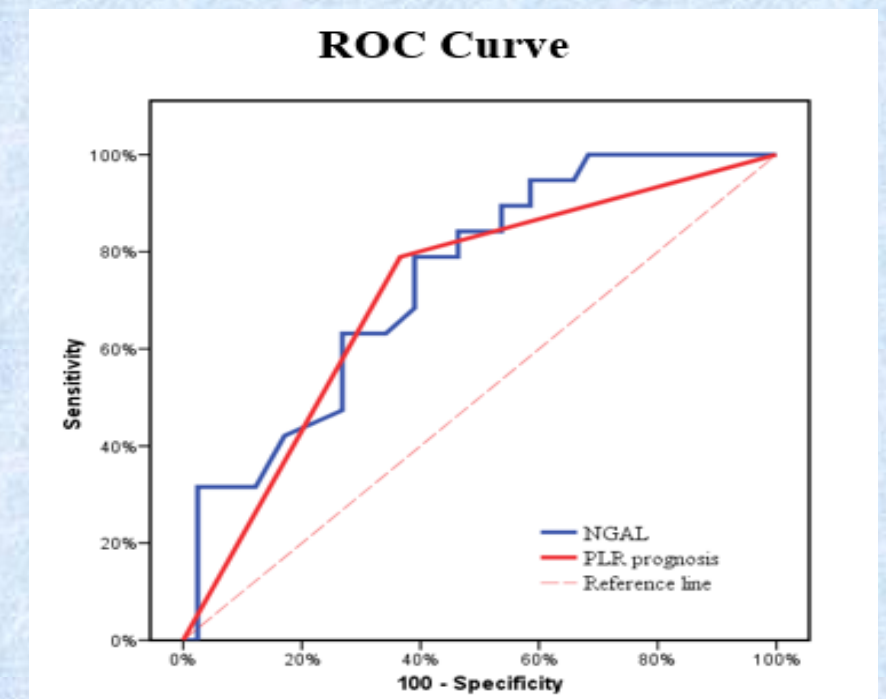|	PLR range						χ²	p
	<90 (n = 10)		90 – 310 (n = 30)		>310 (n = 20)			
	No.	%	No.	%	No.	%		
Mechanical ventilation	4	40.0	8	26.7	16	80.0	13.929	0.001*
Vasopressor	4	40.0	8	26.7	10	50.0	2.871	0.238
Hemodialysis	0	0.0	6	20.0	4	20.0	2.199	MCp=0.370

Figure: ROC curve for NGAL and PLR prognosis to predict mortality

CONCLUSION

- PLR can be used as predictor of mortality in critically ill patients with AKI as there was statistically significant difference in PLR between the two groups according to mortality. Patients with extreme values of PLR (either <90 or >310) were associated with higher mortality compared with patients with PLR ranging between 90 & 310.

- PLR may serve as early fair predictor of unfavorable outcomes including need for mechanical ventilation in critical patients with AKI. PLR was higher in patients who needed mechanical ventilation with mean 516.24 ± 606.2 in comparison to patients who didn't need mechanical ventilation where PLR mean was 191.97 ± 174. This difference was statistically significant (p= 0.002).