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USEFULNESS OF THE NEUTROPHIL-TO-LYMPHOCYTE AND PLATELET-TO-LYMPHOCYTE RATIOS IN THE COMMUNITY-ACQUIRED ACUTE KIDNEY INJURY.

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Introduction and Aims: The neutrophil-to-lymphocyte (NLR) and platelet-to-lymphocyte (PLR) ratios have been identified as markers of inflammation and endothelial dysfunction in recent literature. Both are easily measured, reproducible and inexpensive, therefore cost-effective. To date, its usefulness as prognostic markers in community-acquired acute kidney injury (CA-AKI) has not been evaluated. The aim of this study was to analyze the usefulness of the NLR and PLR in terms of morbidity and mortality in community-acquired acute kidney injury.

Method: We established a cohort of 308 patients with community-acquired acute kidney injury (CA-AKI) admitted to the Nephrology service of a third level hospital from January 2010 to February 2015. NLR and PLR ratios were obtained with the levels of the first analysis performed at admission.

Results: We studied 308 patients with CA-AKI, 180 were men (58,4 %), mean age was 73.22 ($\pm 13,95$). The mean length of stay was 12,25 days ($\pm 11,69$). The etiology of CA-AKI was divided in prerenal 214 cases (69,5%); renal 71 cases (23,1%); obstructive 23 cases (7,5%). AKI KDIGO stages were stage I, 45 cases (14,6%); stage II, 34 cases (11%); stage III 229 cases (74,4%). Previous chronic kidney disease (CKD) was detected in 212 cases (68,8%). A total of 54 patients (17,15%) required hemodialysis and 38 patients died during admission (12,3%).

Mean NLR was 9.14 ± 8.47 (95% IC 8,2-10,1). Mean PLR was $236,99 \pm 228,41$ (95% IC 211,38-262,6). NLR according to etiology was: prerenal $8,55 \pm 6,8$; renal $9,37 \pm 9,8$; obstructive $13,99 \pm 14,82$ (significant differences of the latter group compared to the prerenal group). PLR according to etiology: prerenal $228,31 \pm 216,34$; renal $236,15 \pm 233,77$; obstructive $320,37 \pm 304,89$ (non-significant differences). Within the group of prerenal origin, 79 cases were complicated by the development of acute tubular necrosis (ATN). These cases presented a higher NLR (NLR of ATN $10,7 \pm 10,28$ vs NLR of pure prerenal $7,8 \pm 5,6$; $p=0,026$). There were no significant differences between the PLR of the pure prerenal group and the group with ATN ($225,95 \pm 262,54$ vs $285,78 \pm 278,61$).

The NLR showed a significant correlation with the peak creatinine ($r=0,186$; $p=0,001$) and with the serum albumin ($r=-0,237$; $p < 0,001$). The PLR also showed correlation with the peak creatinine ($r=0,134$, $p=0,018$) and the serum albumin ($r=0,165$, $p=0,07$). The NLR, but not the PLR, was associated with the length of hospital stay (multiple linear regression analysis). Through a multivariate binary logistic regression analysis, the variables that were independently associated with mortality during admission were the Liano individual severity index and the NLR (OR 1,060; IC 95 % 1.014 – 1,108). The variables that were ruled out by the model were sex, age, Charlson comorbidity index, peak creatinine, serum albumin, chronic kidney disease, etiology of AKI (prerenal vs. non renal), potassium, KDIGO stage of AKI, need of hemodialysis and PLR.

The best cut-off point of the NLR to predict mortality was 6,68 (AUC 0,584; sensitivity 0,60; specificity 0,58; Youden index 0,178)

Conclusion: In our cohort of patients affected by CA-AKI, the NLR was associated with the morbidity and the mortality during admission. More studies are need to confirm this finding, but the easiness of obtaining it and its economic cost make it cost-effective, giving the NLR a leading role in assessing the risk of CA-AKI.