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Neutrophil to lymphocyte ratio is independently associated with arterial stiffness in patients with chronic kidney disease

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Objectives: Chronic inflammation is common in patients with chronic kidney disease (CKD) and is associated with increased cardiovascular mortality in them. Neutrophil to lymphocyte ratio (NLR) was introduced as a potential marker of inflammation in cardiac and non-cardiac disorder. Emerging evidence has suggested that NLR might be a useful marker of cardiovascular disease (CVD). Brachial-ankle pulse wave velocity (BaPWV) is a measure of arterial stiffness and known to be useful in predicting the CVD in CKD patients. This study aimed to investigate the association between NLR and arterial stiffness measured by baPWV in patients with CKD patients.

Methods: This study included 852 patients with pre-dialysis CKD [estimated glomerular filtration rate (eGFR) < 60 ml/min/1.73m^2]. Baseline valuables (age, gender, diabetes, hypertension, eGFR, albumin, uric acid, calcium, phosphate, total cholesterol, body mass index, C-reactive protein, hemoglobin, and NLR) were evaluated in the study population. NLR values were calculated from complete blood count. The arterial stiffness was measured by BaPWV. The associations between NLR and baseline valuables were investigated by Pearson's correlation and multiple linear regression analysis.

Results: In Pearson's correlation, the baPWV correlated with NLR, age, diabetes, hypertension, smoking, eGFR, uric acid ($r = 0.107$, $P = 0.002$), total cholesterol, and CRP. In multiple regression analysis, the NLR was independently associated with baPWV ($\beta = 0.100$, $P = 0.003$) after adjustment for other confounding factors. In addition, age ($\beta = 0.158$, $P < 0.001$), DM ($\beta = 0.087$, $P = 0.01$), hypertension ($\beta = 0.117$, $P = 0.001$), total cholesterol ($\beta = 0.074$, $P = 0.027$) and CRP ($\beta = 0.11$, $P = 0.004$) were independent predictors of the baPWV.

Conclusions: This study showed that an increased NLR was independently associated with increased baPWV in CKD patients, suggesting NLR is an independent predictor of arterial stiffness in CKD patients.