Abstract

Background

CKD is a progressive disorder that is commonly associated with hematological abnormalities.

Objective

The objective of the study was to evaluate the role of hematological biomarkers in predicting CKD progression and related complications in adult patients.

Methods

The retrospective cross-sectional study evaluated hematological parameters such as hemoglobin, RBC, WBC, platelet, and NLR; comorbidities; and CKD stages were recorded for analysis. Statistical analysis methods used included ANOVA, Chi-square, multiple logistic regression, Pearson correlation analyses, and ROC curve analysis. The study was conducted under strict adherence to the principles and guidelines of the Helsinki Declaration (2013).

Results

The mean age was 56.2 ± 14.8 years, with males being 56.7%. About 70.8% of the patients were in CKD Stages 3–5. Anemia was observed in 74.2% of the patients, whose prevalence increased alongside the increase in severity of CKD ($p < 0.001$). There was a significant decrease in hemoglobin, RBC, and platelet counts with advancing CKD stages, whereas WBC and NLR increased ($p < 0.001$). Hemoglobin (OR: 0.72; $p < 0.001$), NLR (OR: 1.43; $p = 0.006$), and platelet count (OR: 0.98; $p = 0.021$) were independent predictors of progression to CKD Stage 5. ROC analysis yielded good results for hemoglobin (AUC: 0.81) and NLR (AUC: 0.76) in predicting CKD Stage 5. Hemoglobin and platelet-count levels were significantly correlated with eGFR ($r = -0.70$ and $r = 0.58$, respectively).

Conclusion

The performance of hematological biomarkers, mainly hemoglobin and NLR, emerges as reliable predictor of CKD progression and complications. Their assessment as part of the CKD workup may then enhance risk stratification and early intervention.