PROGNOSTIC SIGNIFICANCE OF NGAL IN EARLY STAGE CHRONIC KIDNEY DISEASE

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Objectives:

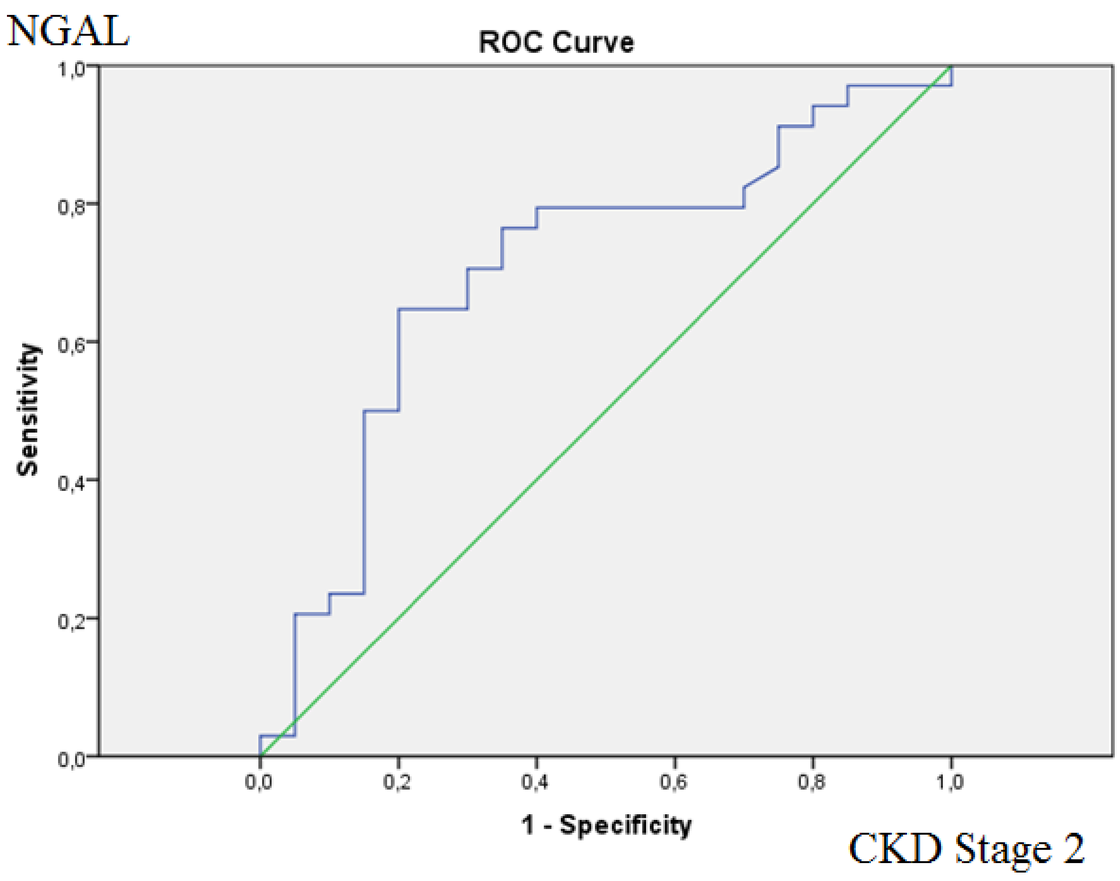
Neutrophil gelatinase-associated lipocalin (NGAL) has been proven to be a useful biomarker for early detection of acute kidney injury, but it is not known whether adding NGAL measurements to conventional risk factors will improve the risk assessment in setting of CKD. The aim of the present study was to examine the correlation of NGAL with early stage renal impairment in CKD and to evaluate its prognostic value in these subjects.

Methods:

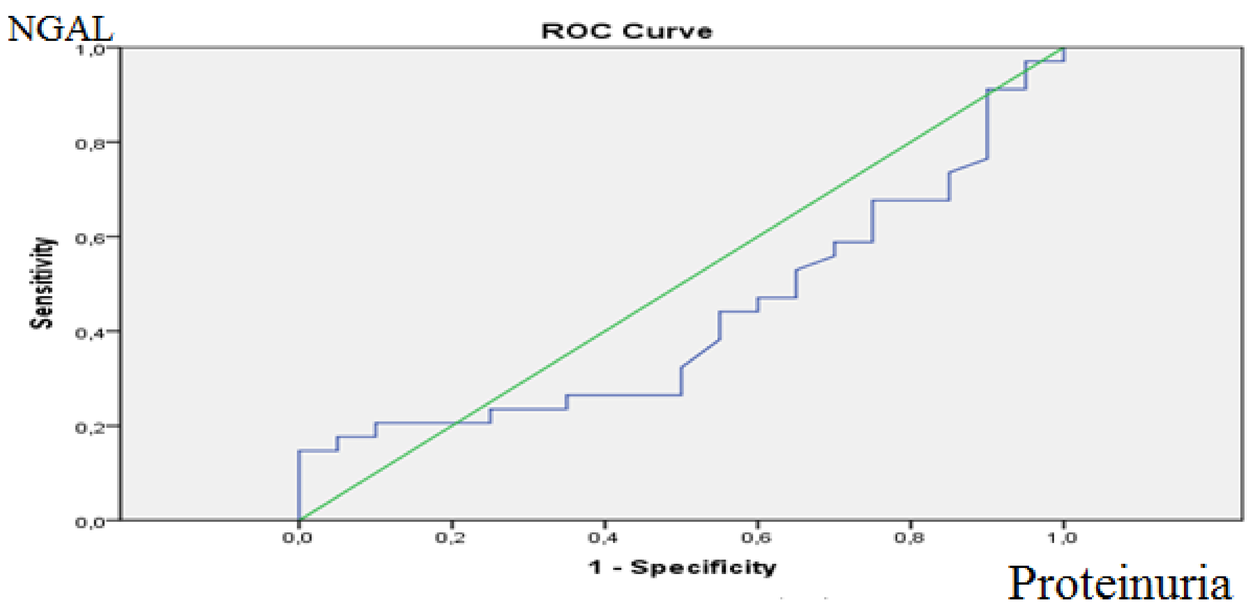
This is a prospective observational cohort study of 54 patients with early stage (Stage 1-2) CKD. Patients aged between 18-65 years with stable CKD (defined as fluctuations of serum creatinine < 10% in at least three readings during the 3 months) were enrolled in this study. Patients with a history of primary glomerulonephritis, diabetes mellitus and stage 3-4-5 CKD were excluded from the study. Estimated glomerular filtration (eGFR) rate was calculated by CKD-EPI formula. The patients were followed for 2 years to determine the ability of baseline NGAL for prediction of renal outcome. In our study disease progression was decided on changes in eGFR and proteinuria.

Results:

Out of 54 patients (mean age: 45,6 ± 6 years, 64.8% female, baseline eGFR: 84.6 ± 16.8 mL/min/1,73 m^2, baseline NGAL levels: 157.47 ± 121.52 ng/mL); 18 patients were stage 1 and 36 patients were stage 2 CKD. In the ROC analysis, we found that the optimal cut-off value of NGAL for predicting stage 2 CKD was 98,71 ng/ml (p: 0.005) with the 72.2% sensitivity and 72.2% specifity. In correlation analysis, we found significantly positive corelations between NGAL and CKD stage (r=0.389, p=0.004), baseline and last serum creatinin (r =0.530, p<0.001 and r = 0.439, p=0.003, respectively), last proteinuria (r=0.359, p=0.043). There were significantly negative correlation between NGAL and baseline and last eGFR (r = -0.498, p<0.001 and r= -0.462, p=0,002, respectively). There were no correlation between NGAL and age, gender, serum urea, baseline proteinuria, changes (Δ) of eGFR and proteinuria. Compared to the Group 1 (NGAL>98.71 ng/ml), we found that Group 2 patients (NGAL > 98.71 ng) had further deterioration in renal functions regarding ΔeGFR (-1.12 ± 12.6 mL/min vs. -1.46 ± 12.4 mL/min, respectively, p:0.930) and Δproteinria (98.1 ± 569.3 mg/day vs. 339 ± 701.6 mg/day, respectively, p: 0.305), however this differences were not significant level at the end of the 2-year-follow up period.



CKD Stage 2



Proteinuria

Conclusions:

Our study results showed that NGAL has a positive correlation with disease severity, but it is not a marker of disease progression in patients with early stage (1-2) CKD.

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