URINARY NGAL IS ASSOCIATED WITH TUBULAR ATROPHY IN PATIENTS WITH CKD

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INTRODUCTION AND AIMS

NGAL (Lipocalin-2) is well known as biomarkers of acute kidney injury. Some studies during last years showed that using of this marker can reflect the course of chronic kidney disease. It is suggested that level of LCN2 gene expression is connected with the degree of interstitial fibrosis and degenerative changes of tubular epithelial cells. The aim of our investigation was assessment of relationship between level of urinary NGAL and pathomorphological changes of kidney tissue.

PATIENTS

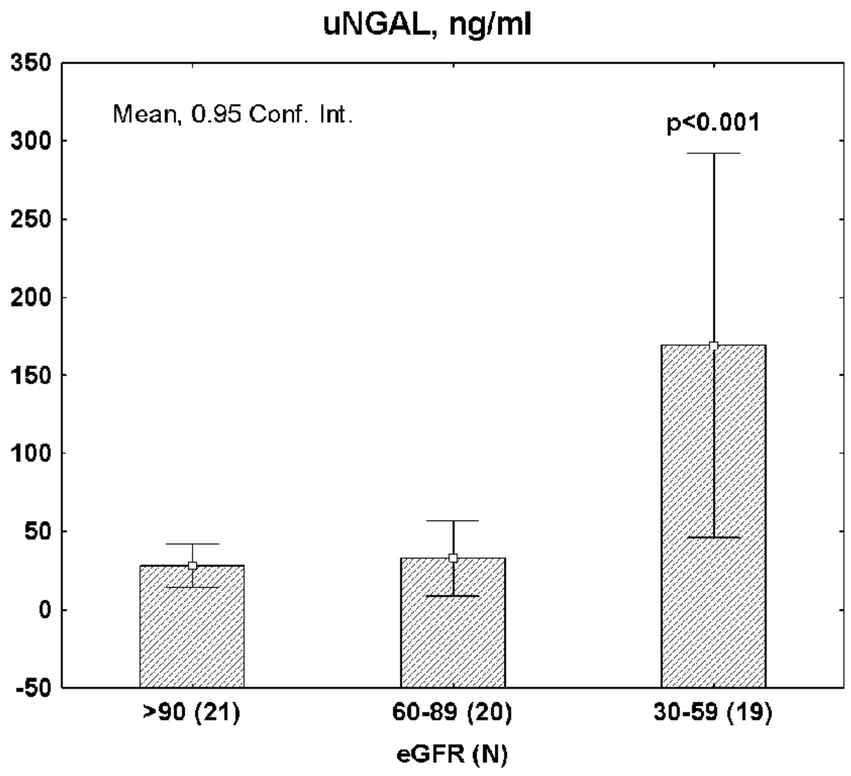
In cross-sectional study 60 patients with primary glomerulonephritis proven by biopsy were included. Patients with acute kidney injury, infectious diseases, heart failure, respiratory insufficiency and cancer pathology were excluded. According the results of light microscopy 29 (48%) patients had IgA-nephropathy, 12 (20%) – focal segmental glomerulosclerosis, 10 (17%) – membranous nephropathy, 9 (15%) – minimal change disease. Samples of serum and urine were obtained in the day of biopsy.

METHODS

NGAL level was studied using chemiluminescent microparticle immunoassay (CMIA) (Abbott), cystatin C using turbidometry (Alfresa). GFR was estimated using CKD-EPI (2009), CKD-EPI (2012). Glomerulosclerosis, interstitial fibrosis and tubular atrophy were estimated quantitatively and semi quantitatively

RESULTS

Urinary NGAL (uNGAL) was significantly increased in patients with eGFR 30-59 ml/min/1.73 m2 (figure 1). The level of uNGAL correlated with daily protein loss (r=0.41, p=0.002), urinary cystatin C (r=0.56, p<0.001), eGFR, estimated using CKD-EPI Cystatin C Equation (r=-0.33, p=0.021) and CKD-EPI Creatinine-Cystatin Equation (r= -0.30, p=0.038), while there was no correlation with eGFR, estimated using CKD-EPI Creatinine Equation (r= -0.22, p=0.088). The significant association between uNGAL and tubular atrophy, tubular cell dystrophy was confirmed by a multivariate regression analysis (table 1).



Multiple regression analysis of urinary NGAL level in CKD patients

Independent variables	β	*p* value
Age	0.26	0.090
Sex	0,22	0.090
eGFR	-0.08	0.57
Glomerulosclerosis	0.03	0.88
Tubular cell distrophy	**0.36**	0.012
Tubular atrophy	**0.62**	0.027
Interstitial fibrosis	-0.46	0.12
Leukocytic infiltration	0.04	0.82

CONCLUSIONS

Elevated uNGAL level is associated with CKD progression by reason of pathomorphological changes of tubular epithelium.

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