
Evaluation of serum neutrophil Gelatinase associated lipocalin as an early biomarker of nephropathy in type 2 diabetic patients.

Doaa Abd Elhady Ibraheem Elordy

Diabetic nephropathy is one of the most devastating complications of diabetes and develops in about one-third of diabetic patients. Neutrophil gelatinase associated lipocalin (NGAL) has emerged in clinical and experimental nephrology as one of the most promising tubular biomarkers in diagnostic field of acute and chronic renal diseases. The current study aimed to evaluate the serum neutrophil gelatinase associated lipocalin level as an early biomarker of diabetic nephropathy in type 2 diabetic patients. This work performed on 60 patients diabetes mellitus type 2 and 20 apparently healthy subjects working as control. Patients were further classified according to their microalbumin/creatinine ratio into three groups: group II; normoalbuminuric diabetic, group III; microalbuminuric diabetic group and group VI; diabetics with overt proteinuria. Candidates of the present study were subjects to -clinical evaluation and determination of fasting blood sugar, serum creatinine, C reactive protein, total leucocytic count, glomerular filtration rate, albumin creatinine ratio and s. NGAL. The results of the present work showed that:-

- No significant difference of sex distribution among the studied groups.
- The duration of diabetes in diabetic patients with macroalbuminuria was statistically significant longer than in nomolbuminuric, microalbuminuric diabetic patients and in patients with microalbuminuria was statistically significant longer than normoalbuminuric diabetic patients.
- Systolic blood pressure and diastolic blood pressure are significantly higher in diabetic patients with macroalbuminuria compared to microalbuminuric and normoalbuminuric diabetic patients.
- Fasting blood sugar was significantly higher in patients with advanced stage of diabetic nephropathy (macroalbuminuric diabetic patients) compared to normoalbuminuric diabetic patients and microalbuminuric diabetic patients .
- A significant increase of serum creatinine in diabetic patients with microalbuminuria and diabetic patients with macroalbuminuria compared to the normalbuminuric diabetic group.
- Urinary microalbumin was significantly higher in microalbuminuric diabetic group and normoalbuminuric diabetic group compared to normal subjects and in diabetic patients with microalbuminuria was significantly higher in diabetic patients with normoalbuminuria.
- A significant increase of ACR in diabetic patients with microalbuminuria and diabetic patients with macroalbuminuria compared to the normoalbuminuric diabetic group.
- A significant decrease of glomerular filtration rate in diabetic patients with macroalbuminuria as compared to the normo and

microalbuminuric diabetic group. • A significant increase serum level of NGAL in macroalbuminuric diabetic patients compared to microalbuminuric diabetic patients and in microalbuminuric diabetic patients compared to normoalbuminuric diabetic patients . • A significant increase serum level of NGAL in normoalbuminuric diabetic patients compared to control subjects. • A significant positive correlation between NGAL with the duration of diabetes, fasting blood glucose, s.creatinine, albumin in urine, ACR and the number of TLC. sNGAL values showed a significant negative correlation with GFR and there is on correlation between NGAL and age of patients. Conclusion: The present pilot study has clearly demonstrated that diabetic patients showed increased sNGAL, and the severity of renal damage caused by diabetic disease is well reflected by these levels. In our opinion, these results have an intrinsic importance for at least two reasons. First, as previously reported for other chronic kidney disease- associated conditions, it could be presumed that NGAL might play an important role in the pathophysiology of renal adaptation to diabetes, probably as a compensatory, defensive mechanism aiming at mitigating persistent tubular suffering caused earlier by metabolic and hemodynamic factors and then by severe proteinuria. Second, some important diagnostic implications, which therefore have to be further validated in larger population. Recommendations: Further investigations are required to confirm the potential application of NGAL as a useful biomarker for the precocious diagnosis of incipient nephropathy in larger population and to ascertain its eventual relevance as a parameter for monitoring the development and the progression of diabetic nephropathy. Further studies are recommended to investigate the role of measurement of urinary NGAL in assessment of renal functions.