EVALUATION THE URINARY LEVELS OF KIDNEY INJURY MOLECULE-1 IN PATİENTS WITH CHRONİC KIDNEY DISEASE SECONDARY TO DIABETİC NEPHROPATHY

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OBJECTIVES

Early diagnosis of diabetic nephropathy is essential in avoiding of end stage renal disease. Markers used for dianosis of renal damage in diabetic patients have known handicaps, therefore, investigators search for new biomarkers in diagnosis of renal damage. Kidney Injury Molecule-1 (KIM-1) is a protein that increases in urine following tubular damage. We studied urinary KIM-1 levels according to the level of Chronic Kidney Disease (CKD) based from diabetic nephropathy.

METHODS

We evaluated clinical and laboratory findings of 69 patients with diabetic nephropathy who were followed by nephrology department of our institution and 18 healthy volunteers. Creatinine, albumin, total cholesterol, triglyceride, low density lipoprotein cholesterol, high density lipoprotein cholesterol and HbA1c levels in blood samples and albumin, creatinine and KIM-1 levels in urine samples assessed. KIM-1 levels adjusted for creatinine concentration to account for day-today variation in urine volume. Glomerular filtration rate (GFR) calculated by Modification of Diet in Renal Disease (MDRD) formula.

RESULTS

Urinary KIM-1 /creatinine levels [(pg/ml)/(mg/dl)](uKIM-1) were significantly increased in all stages of CKD patients (CKD stage 2-4) compared to controls (2.8 ± 0.7 vs 1.4 ± 0.2, $p<0.01$). uKIM-1 were significantly higher in stage 2 CKD patients (3.7 ± 0.9), compared to both stage 3 (2.7 ± 0.8) and stage 4 (2.2 ± 0.6) CKD patients. (all $p<0.01$). Although uKIM-1 of stage 4 CKD patients were higher than control group, the difference did not reached statistically significance level ($p>0.05$). In addition, uKIM-1 were not significantly different in subgroups (normo/micro/macro-albuminuria) of diabetic nephropathy. uKIM-1 were not correlated with albuminuria, however, positively correlated with the duration of diabetes ($p=0.027$, $r=0.322$) and inversely and poorly correlated with GFR ($p=0.043$, $r=0.214$).

CONCLUSIONS

We showed that urinary KIM-1 levels were increased in all three diabetic nephropathy stages independent of the levels of urinary albumin excretion. Therefore, we think that KIM-1 should be useful in early diagnosis of diabetic nephropathy. In addition, elevated levels of KIM-1 in every 3 stages of diabetic nephropathy indicates tubulary injury beside glomerular damage. We also showed that urinary KIM-1 levels increase in early stages of CKD (stage 2) and decreases to above normal levels as CKD progresses to stage 3 and 4. These findings suggest that urinary KIM-1 levels should be useful in determining the progression of renal failure due to diabetic damage.

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