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## Level of human Kidney Injury Molecule-1 (KIM-1) as an early marker for diabetic nephropathy in Egyptian type-2 diabetic patients

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**Background:** Human Kidney Injury Molecule-1 (KIM-1) is produced in the affected segments of the proximal renal tubule, whenever there is a pathophysiological state resulting in dedifferentiation of the epithelium. The kidney injury molecule-1 is a type-1 transmembrane glycoprotein (339 aa). KIM-1 ectodomain is cleaved and shed in a metalloproteinase-dependent fashion. The soluble KIM-1 protein that appears in the urine of humans is about 90 KDa. All forms of chronic kidney disease including diabetes are associated with tubulointerstitial injury.

**Aim:** The current study was performed to assess use of urinary KIM-1/creatinine ratio as a sensitive diagnostic tool for renal injury in the urine of patients with type-2 diabetic Egyptian patients.

**Methods:** Eighty (80) subjects were subjected to clinical examination included and subdivided as 20 apparently healthy control volunteers (group-I) and 60 diabetic patients who were divided into 3 subgroups (Group-II, Group-III and Group-IV) of 20 patients each, according to ACR (ACR<30 mg/g, 30-299 mg/g and  $\geq$ 300 mg/g respectively). All were subjected to laboratory investigations which included: Morning mid-stream urine sample for (1) complete urine analysis, (2) quantitative measurement of urinary albumin, (3) urinary creatinine, (4) calculation of urinary albumin to creatinine ratio, (5) measurement of KIM-1 (ELISA), (6) calculation of KIM-1 to creatinine ratio, (7) calculation of estimated Glomerular Filtration Rate (eGFR) and (8) the estimation of fasting, post prandial glucose, urea and creatinine serum levels and blood level of glyclated hemoglobin (HbA1c).

**Results:** Urinary KIM-1 levels were increased with the progression of nephropathy. Urinary KIM-1 levels were independent risk factor of eGFR and albuminuria in diabetic patients. Urinary KIM-1/Cr ratio was more sensitive than KIM-1. There was no correlation between urinary KIM-1/Cr ratio and GFR in all studied groups.

**Conclusion:** Urinary KIM-1/Cr ratio is a sensitive, noninvasive diagnostic tool for kidney affection in type-2 diabetic patients that seemed to predict renal injury in early period independent of albuminuria. Due to lack of correlation, both KIM-1/Cr and Alb/Cr ratios are required to be calculated for type-2 diabetic patients.

**Recommendations:** The use of KIM-1/Cr ratio as a diagnostic tool for kidney affection by measuring it in urine of type-2 diabetic patients is at a risk of chronic kidney disease.

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