

Evaluation of Urinary Tubular Enzymes as Screening Markers of Renal Dysfunction in Patients Suffering from Diabetes Mellitus

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Abstract:

To determine the relationship between sub clinical kidney injury caused by diabetes mellitus and the levels of urinary enzymes; N-acetyl-1& -D-glucosaminidase, lactate dehydrogenase, alkaline phosphatase and gamma glutamyl transferase in relation to urinary concentration of microprotein, serum urea and creatinine. The study subjects comprised 251 patients with Diabetes Mellitus (cases), and 73 healthy individuals (control group). The cases were further subdivided into those with normoproteinuria, microproteinuria and kidney failure. Glomerular function was studied by urinary levels of protein (U.mp), serum urea and creatinine while proximal tubular structural integrity was studied by determining the activities of the enzymes U.ALP, U.NAG, U.y -GT, and U.LDH. Compared with healthy individuals, diabetic patients with normoproteinuria excreted significantly high levels of U.ALP, U.LDH, U.y -GT, and U.NAG ($p < 0.05$). Patients with kidney impairment excreted high levels of the enzymes and urinary microprotein compared to healthy individuals and diabetic patients without kidney failure. Diabetes mellitus leads to subclinical renal injury; that urinary excretion of U.ALP, U.LDH, U.y -GT, and U.NAG could be useful biomarkers for proximal tubular injury. These results suggest that site-specific urinary biochemical markers provide valuable information about early renal proximal tubular insult that ultimately may precede glomerular permeability in subjects with diabetes mellitus