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Role of NAG in early detection of diabetic nephropathy

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Abstract

End Stage Renal Disease is the major unavoidable health burden of diabetic complications. The biopsy and microalbuminuria is presently considered as an early stage of diabetic nephropathy with known limitations. N-Acetyl β D- Glucosaminidase (NAG) is one of the principal enzyme involved in mucopolysaccharide and glycoprotein metabolism of basement membrane of proximal tubule. The proximal tubular damage leads to the source of lysosomal enzymes excretion in the earliest stages of diabetic nephropathy. Thus lysosomal enzymes excreted in urine can be used as non invasive diagnostic test. Hence, the aim of the study was to assess the early involvement of NAG in progression of the condition. A total of 436 patients, consisting of normal healthy adults (Group A, N=70), diabetics without any complications (Group B, N=166), diabetics with microalbuminuria (Group C, N=50), diabetic nephropathy (Group D, N=100) and other nephropathy (Group E, N=50) were considered for the study. Activities of NAG (U/g creatinine) for Group A, B, C, D and E are expressed as mean ± SD: 0.76 ± 0.7, 1.74 ± 1.2, 13.87 ± 1.1, 15.87 ± 2.6 and 0.44 ± 0.3 respectively. A significant elevation in groups B, C and D is seen when compared with the control group (group A vs. groups B, C and D: $P<0.0001$) and that with group E (group A vs. group E: $P=0.136$) showed no significance. The result thus suggests NAG as a site specific non invasive diagnostic biomarker useful to predict the early progression of secondary complication of diabetes (specifically Type 2 Diabetes Mellitus) in our study.