SUMMARY AND CONCLUSION

Diabetic nephropathy is the main cause of increased morbidity and mortality in patients with insulin-dependent diabetes mellitus (IDDM). Diabetic nephropathy denotes a clinical condition characterized by persistent proteinuria, decline in renal glomerular function, hypertension and progression to end-stage renal disease. ACR and NAG are the hallmark for incipient diabetic nephropathy with NAG; early intervention at this stage may retard the progression into end-stage renal failure.

In this study seventy five patients with insulin-dependent diabetes mellitus, 36 females and 39 males, were screened for glomerular and tubular microproteinuria. They had a mean age of 12.17 ± 13.45 years (range 4.9-18.2 years), and a mean duration of diabetes of 6.9 years (range 0.6-14 years). Fifteen healthy subjects, age and sex matched, were selected as controls. Three samples for three consecutive days of early morning urine were collected and tested for albumin/creatinine ratio and 24 hours of urine was collected for N-acetyl-beta-D-glucosaminidase. Samples of blood were collected and tested for sialic acid, nitric oxide, prorenin, cholesterol, high density lipoprotein, RBS, FBS, urea, creatinine and HbA1c.

The frequency of ACR in diabetic patients was 44% (33 patients), with cut off o.18 mg / mmol (range 0.08 – 0.49). NAG was 58.6% (44 patients of 75 IDDM), with cut off 12.3 u/g (range 5.5 – 49.2) both were significantly high compared to controls.

ACR and NAG were correlated with, sialic acid, prorenin, HbA1c and nitric oxide, however, no correlation was present between ACR and the duration of diabetes, SBP and DBP but NAG was correlated with the duration of disease . NAG was detected earlier in some diabetic patients with normal level of ACR .

We suggested that, there is tubular dysfunction (NAG) can be used as early marker in diabetic patients even before any significant elevation in

the level of ACR (glomerular dysfunction). Prorenin, SA, and NO are significantly increase after elevation the level of ACR.

Blood pressure increasing can occur before or after the significant increase ACR, but we are suggesting, it is more related to a rise in intraglomerular pressure that initiate the renal lesion before the increase of SBP.

Neuropathy also can occur with and without evidence of DN in type I diabetic patients. HDL and cholesterol can be significantly increase with elevation ACR.

In conclusion, estimation of albumin/ creatinine ratio and NAG should be considered as a routine investigation in the follow up and management of IDDM. Since patients with significant increase of ACR have higher mean HbA1c, it is likely that they may benefit from strict metabolic control and antihypertensive therapy. Further assessment is needed to define whether any of our patients has passed into the stage of incipient nephropathy is expected to occur. Also since a critical level of ACR and NAG has been defined (more than the upper limit at least in two of three early morning urine sample and in collected urine of 24 hours respectively), the patients in our study with ACR and NAG above these levels will be in need close follow up with intensification of glycemic control , which, if not will reserve, will at least delay the rate of progression and deterioration to end-stage renal disease. Trial of angiotensin converting enzyme inhibitor therapy in normotensive with significant increase in ACR diabetics is worth to be evaluated. Finally, ACR is probably glomerular in origin, and NAG is tubular in origin, both are very important to follow up the IDDM children and adolescents and can be used as early marker for DN detection. Prorenin, SA, and NO can used for follow up the patients of DN. Genetic predisposition is probably a prerequisite for the development of nephropathy in IDDM.