Original Research Article

Spectrum of diabetic nephropathy in type II DM

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Abstract

Diabetic nephropathy is the leading cause of chronic kidney disease in patients starting renal replacement therapy and is associated with increased cardiovascular mortality. Diabetic nephropathy has been classically defined by the presence of proteinuria >0.5 g/24 h. This stage has been referred to as overt nephropathy, clinical nephropathy, proteinuria, or macroalbuminuria. **Methods:** In this prospective study, 50 patients diagnosed diabetics were studied. Group A had 25 patients with at least one risk factor are hypertension, hypercholesterolemia and obesity. Group B had 25 patients without any of the risk factors. Patients who were selected for presence of Diabetic nephropathy with abnormal serum Creatinine, creatinine clearance and urinary albumin levels. **Results:** As many as 8 out of 50 patients were found to have Diabetic nephropathy. The number was significantly higher in group A compared to group B. Incidence of nephropathy was higher with higher number of associated risk factors. Urinary microalbuminuria was the commonest abnormality, Serum creatinine was found in only 25.84% of total positive cases. **Conclusions:** Hypertension, obesity and hypercholesterolemia can contribute to development of nephropathy, and also, urinary microalbuminuria appears to be much more sensitive than serum creatinine.

Keyword: type II DM.

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INTRODUCTION

Diabetes Mellitus (DM) is one of the commonest diseases in the world, especially the industrialized world. But recently, the "Silent epidemic" of diabetes has been spreading like a wild fire through the developing world. India has earned the dubious distinction of being termed the "Diabetes capital of the world" with number of patients expected to cross 79.4 million by year 2030.[1] The dangerous fact about diabetes is that it is a "Silent killer". By the time patient is diagnosed to have diabetes, he/she is already affected with complications like diabetic nephropathy, retinopathy and neuropathy. Diabetic nephropathy has been didactically categorized into stages based on the values of urinary albumin excretion (UAE): microalbuminuria and macroalbuminuria. The cutoff values adopted by the American Diabetes Association[1](timed, 24-h, and spot urine collection) for the diagnosis of micro- and macroalbuminuria, as well as the main clinical features of each stage, are depicted in. There is accumulating evidence suggesting that the risk for developing diabetic nephropathy[2-5] and cardiovascular disease[6,7]starts when UAE values are still within the normoalbuminuric range. Progression to micro- or macroalbuminuria was more frequent in patients with type 2 diabetes with baseline UAE above the median (2.5 mg/24 h)[2]. After 10 years of follow-up, the risk of diabetic nephropathy was 29 times greater in patients with type 2 diabetes with UAE values >10 µg/min[3]. The same was true for patients with type 1 diabetes[4]. This favors the concept that the risk associated with UAE is a continuum, as is the case with blood pressure levels[8]. Possibly, values of UAE lower than those currently used for microalbuminuria diagnosis should be established.

METHODOLOGY

This was cross-sectional study carried out from March2018 to June2018 at M.G.M. Medical college and L.S.K. Hospital Kishanganj, Bihar. A total 30 patients were male and 20 were female. The mean age was 47.2. Informed and written consent was obtained from patient or a responsible attendant before including the patient in the study.

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- Fasting Blood glucose- ≥126mg/dl (12 Hours fasting).
- Postprandial Blood glucose- ≥200 mg/dl.(2 hours after taking meal)
- Microalbuminuria can be diagnosed from a 24-hour urine collection (between 30-299mg/24 hours) or, more commonly, from elevated concentrations in a spot sample (30 to 299mg/L).

We have divided the patients in 2 groups of 25 patients each.

Group A: Diabetic patients with hypertension or obesity or hypercholesterolemia.

Group B: Diabetic patients without any of comorbidities.

Inclusion criteria

- Age more than 20 years.
- Detection of diabetes within 6 months at the time of enrolment in study.

Exclusion criteria

- Type 1 diabetes mellitus.
- Diabetes for more than 6 months.

History of Hypertension, blood pressure was recorded more than 140/90mmHg Complete lipid profile was done for hypercholesterolemia. both the groups for prevalence of diabetic nephropathy and analyzed if there was a statistical difference in between these groups.

RESULTS

Table 1: Age sex distribution of study subject

Age group	Group A(n=25)				Group B(n=25)			
	Male	%	Female	%	Male	%	Female	%
20-30	2	8	1	4	1	4	0	0
31-40	3	12	3	12	4	16	2	8
41-50	6	24	5	20	8	32	5	20
>50	3	12	2	8	3	12	2	8
Total	**14**	**56**	**11**	**44**	**16**	**64**	**9**	**36**

A total 30 patients were male and 20 were female. The mean age was 47.2.

Table 2: Patients detected with nephropathy in both groups

	Group A(n=25)		Group B (n=25)	
	Present	Absent	Present	Absent
Diabetic Nephropathy	6(24 %)	19(76%)	2(8%)	23 (92%)

In this study, out of 50 total patients, 8 patients were detected to have Diabetic Nephropathy. In group A, out of 25 patients 6 (24%) patients had diabetic nephropathy, while in group B, out of 25 patients 2 (8%) patients had diabetic nephropathy.

Table: 3: Comorbidities

	With Nephropathy (n=8)		Without nephropathy(N=42)	
	Present	Absent	Present	Absent
Hypertension	7(87.5%)	1(12.5%)	9(21.5%)	33(78.5%)
Hypercholesterolemia	6(75.0%)	2(25.0%)	8(19.0%)	34(81.0%)
Hypertension+ Hypercholesterolemia	6(75.0%)	2(25.0%)	7(16.7%)	35(73.3%)
Obesity	7(87.5%)	1(12.5%)	5(11.9%)	37(88.1%)
Hypercholesterolemia+Obesity	6(75.0%)	2(25.0%)	5(11.9%)	37(88.1%)
Hypertension + Obesity	6(75.0%)	2(25.0%)	5(11.9%)	37(88.1%)

A subgroup analysis was done with regards to multiple co-morbidities, showing increasing number of patients affected with increasing comorbidities of with diabetic nephropathy patients.

Table 4: Prevalence of microalbuminuria among diabetic nephropathy patients

		With Nephropathy (n=8)	Without nephropathy (n=42)
		Present	Present
Normoalbuminuria <20 mg/24hours urine		00	40
Microalbuminuria	Mild(20 - 50 mg/24hours urine)	04	02
	Moderate (>50-100 mg/24hours urine)	03	00
	Severe (>100 mg/24hours urine)	01	00

DISCUSSION

Diabetic nephropathy is a dreaded complication of DM and early detection is of paramount importance. Earlier, it has been shown that Nephropathy is present in about 15-18% of patients with newly diagnosed type 2 Diabetes.[9] In this study, out of 50 total patients, total 08 patients

were detected to have Diabetic Nephropathy. In group A, out of 25 patients 6 (24%) patients had diabetic nephropathy, while in group B, out of 25 patients 2 (8%) patients had diabetic nephropathy. Study of development and progression of nephropathy in type 2 Diabetes by Amanda I.[10] Adler, Stevens RJ in United Kingdom showed the prevalence of nephropathy in recently detected type 2 DM to be 7.3%. Study by Ghai *et al* on microalbuminuria showed the prevalence of Nephropathy in type 2 DM at onset to be 25%.[11] Chowta NK and Pant's P study on relation of microalbuminuria in type 2 DM with relation to age, sex weight and creatinine clearance showed prevalence of nephropathy at onset to be 37%.[12] Study by Agarwal N, Sengar NS has shown that there is 17.34% prevalence of diabetic nephropathy in recently detected type 2 DM, but with hypertension this prevalence was shown to be as high as 60%.[13].The higher prevalence of diabetic nephropathy found in this study could be attributed to a variety of factors. The overall prevalence of microalbuminuria and macroalbuminuria in both types of diabetes is approximately 30-35%. Microalbuminuria independently predicts cardiovascular morbidity, and microalbuminuria and macroalbuminuria increase mortality from any cause in diabetes mellitus. Microalbuminuria is also associated with increased risk of coronary and peripheral vascular disease and death from cardiovascular disease in the general nondiabetic population. Patients in whom proteinuria has not developed have a low and stable relative mortality rate, whereas patients with proteinuria have a 40-fold higher relative mortality rate. Patients with type 1 DM and proteinuria have the characteristic bell-shaped relationship between diabetes duration/age and relative mortality, with maximal relative mortality in the age interval of 34-38 years (as reported in 110 females and 80 males). In this study, author detected 6 out of 25 patients in Group A (those having hypertension and/or hypercholesterolemia and/or obesity) to have diabetic nephropathy. While in Group B (without any of the 3 factors), only 2 out of 25 patients were detected to have diabetic nephropathy. Author analyzed this data using Chi2 method and found that association of nephropathy in group A was highly significant at P value < 0.0001.

CONCLUSION

Urinary Albumin is much more sensitive test to detect Nephropathy. And measurement for urine microalbuminuria on two separate occasions (especially in presence of another cause for albuminuria) or measuring the creatinine clearance for the earlier diagnosis of nephropathy. We conclude that S. Creatinine is a very poor marker of Nephropathy and maybe medical fraternity needs to stop depending on it as screening tool for Diabetic Nephropathy. Hypertension, obesity and hypercholesterolemia can contribute to development of nephropathy, and also, urinary microalbuminuria appears to be much more sensitive than serum creatinine.

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