ORIGINAL ARTICLE

Frequency of Diabetic Nephropathy in Tertiary Care Hospital

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ABSTRACT

Aim: To assess frequency of diabetic nephropathy in patients visiting Services Hospital Lahore.
Materials: This prospective cross-sectional study was carried out at Services Hospital from March 2011 to September 2011. One hundred patients who were suffering from type 2 diabetes mellitus and with duration of diabetes less than five years and age between 30 to 70 years were selected. Urine complete examination and urinary albumin to craetinine ratio was seen in the first void urine.
Results: Out of one hundred patients, 20% had urinary albumin to creatinine ratio≥30mg/g and were diagnosed as having diabetic nephropathy. 70% patients had no evidence of diabetic nephropathy.
Conclusion: Diabetic patients under the study have high frequency of diabetic nephropathy.
Keywords: Diabetic nephropathy, Urinary albumin creatinine ratio

INTRODUCTION

Diabetes Mellitus is a major cause of premature mortality worldwide. It is anticipated that by year 2025 there will be four hundred and eighteen million people with impaired glucose tolerance and three hundred and eighty million people with type 2 diabetes. About fifty percent of patients who have type 2 diabetes die prematurely.[1] Diabetes very commonly causes complications and the cost of it to the individual as well as to the society is enormous. The quality of life is reduced by the onset of complications[2,3,4]. The most common global reason for renal replacement therapy is diabetes.[1] It is estimated that end-stage renal disease (ESRD) develops in 20% of type 2 diabetic patients during their lifetime.[1] In the United States of America, about 40% of new end-stage renal disease cases are because of diabetic nephropathy[5]. Renal dysfunction develops in many but not all patients during their life time. In the United Kingdom Prospective Diabetes Study (UKPDS), microalbuminuria developed in 24.9% of patients within ten years of diagnosis of type 2 diabetes. It is estimated that 20% patients of type 2 diabetes during their lifetime, reach ESRD[6].

Impressive evidence suggests that renal disease in these patients is largely preventable. In diabetic patients, renal disease is characterized clinically by increasing rate of excretion of urinary albumin, with progression to diabetic nephropathy, and finally development of end-stage renal disease (ESRD). The earliest clinically detectable stage of diabetic nephropathy is microalbuminuria and the appearance of low but abnormal level **(**30-299mg/day**)** of albumin in urine is the earliest clinical evidence of nephropathy. This is termed as microalbuminuria[5,6,7].

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Without any specific intervention, 80% diabetic with sustained microalbuminuria have 10-20% increase in their rate of urinary albumin excretion per year to the stage of macroalbuminuria or overt nephropathy (urinary albumin excretion ≥300mg per 24hour). In cases of macroalbuminuria, the fall in glomerular filtration rate is highly variable from individual to individual over the period of several years. With specific intervention, the rate of decline in GFR can be retarded.

A great proportion of individuals with type 2 diabetes as compared to type 1 diabetics are found to have microalbuminuria and overt nephropathy shortly after their diabetes is diagnosed. It is because of the fact that diabetes may actually be there for many years before the diagnosis is made. Without specific interventions, microalbuminuria in 20-40% of patients with type 2 diabetes progresses to macroalbuminuria.[7] Albuminuria is not only the earliest manifestation of nephropathy for diabetic patients but also a marker of greatly increased cardiovascular morbidity and mortality.

Thus the microalbuminuria is an indicator for the presence of underlying vascular disease and need to reduce all the cardiovascular risk factors by aggressive interventions. It is very important to detect nephropathy to prevent and decrease morbidity and mortality from and cardiovascular disease and renal disease[8]. In a survey involving more than 1000 of primary care physicians, only 12% of them detected microalbuminuria in more than 50% of their patients with type 2 diabetes mellitus.[9] Assessment of microalbuminuria is of particular importance in order to diagnose diabetic nephropathy because albuminuria of low levels that is dipstick negative is an earlier clinical manifestation of diabetic nephropathy that may be there for several years before the development of a reduced glomerular filtration rate (GFR). Interventions should be initiated

once elevated urinary albumin levels have been detected, to slow the progression of nephropathy.[9,10]This study shows the percentage of patients suffering from diabetic nephropathy. This study gives us very important information about nephropathy in the population of diabetes of less than five years.

PATIENTS AND METHODS

This study was cross-sectional survey comprised 100 patients and carried out in Diabetes Management Centre of Services Hospital Lahore.The participants were classified in two groups; without diabetic nephropathy and diabetic nephropathy. Type 2 diabetic patients between 30 to 70 years old either male or female with their diabetes of less than five years duration were included. Patients who had any acute febrile illness (temperature ≥100F) or urinary tract infection (dipstick urine positive for nitrites or more than 250 leukocytes per ml in urine sample were excluded. On first visit, complete history and physical examination was taken. The patients who gave consent were provided with sterile, well capped plastic container.They were given instruction for collection of first void mid-stream urine.Dipstick and microscopic examination of urine and was done.Immediately urine sample were stored at temperature between 2-4C˚. Sodium azide (0.02%) was added to urine sample to stop bacterial overgrowth.After carefully taking in to consideration the exclusion criteria mentioned above, urine sample were selected for examination. All samples before assay were mixed well. For estimation of microalbumin Randox Microalbumin, an assay based on the principle of Immunoturbidimetric was used. Spectrophotometer was used in laboratory for calculating results.Urine sample was tested for urinary creatinine concentration using Jeffe's reaction.

RESULTS

The majority of the patients i.e., 37(37%) were recorded between 41-50 years of age. There were 48(48%) females and 52(52%) were males. There were 34(34%) hypertensive patients and 23 (23%) patients were cigarette smoker. In patients with type 2 diabetes of duration less than 5 year, the frequency of diabetic nephropathy was calculated as 20(20%) while 80(80%) cases were not recorded with this complications (Table 1) Stratification of diabetic nephropathy patients for age and gender reveals that 7 cases (35%) were present between age group of 41-50 years, 10(50%) between 51-60 years. Majority of patient were male (52%). Majority of patients with

diabetic nephropathy (70%) were hypertensive. Nine patients with diabetic nephropathy were smoker (Table 2).

Table 1: Sociodemographic data of the patients

Variable	n.	%age
Age (years)		
≥31-40	26	26
41-50	37	37
51-60	34	34
61-70	3	3
Gender		
Male	52	52
Female	48	48
Hypertensive status		
Hypertensive	34	34
Normotensive	66	66
Smoking habit		
Smoker	23	23
Non-smoker	77	77
Diagnosis		
Diabetic nephropathy	20	20
No evidence of diabetic nephropathy	80	80

Table 2: Stratification of diabetic nephropathy for age and gender

Age (years)	Yes	No
31-40	1(1%)	25(25%)
41-50	7(7%)	30(30%)
51-60	10(10%)	24(24%)
61-70	2(2%)	1(1%)
Gender		
Male	11(11%)	41(41%)
Female	9(9%)	39(39%)

DISCUSSION

In Pakistan, diabetes mellitus has become a major health problem. The prevalence rates vary from 5% to 15% among rural and urban Pakistani populations [11]. An ominous development in a person with diabetes is persistent clinical proteinuria (excretion of urinary protein greater than 0.5g/24 h). It eventually leads to decrease in the glomerular filtration rate and ultimately to end-stage renal disease or cardiovascular mortality prematurely. In the present study, the frequency of diabetic nephropathy was 20% and the results of this study are comparable to the findings of other epidemiological studies in which the prevalence of diabetic nephropathy varies from 7-53% depending upon the ethnicity i.e. 42% in south Africa, 36.7% in India, 13.6% in Pakistan and 9% in UK population.[12] This variation could be attributed to different facts which include method of assessment, stage of disease and ethnic susceptibility for development of nephropathy. Another finding was the predominance of males with 11 cases as compared

to 9 female cases of diabetic nephropathy in this study.

Duration of diabetes is an important aspect with reference to diabetic nephropathy. In a study at Rawalpindi(a large city of Punjab) 57% of diabetic patients had diabetic nephropathy even when the diabetes was of less than 10 years duration.[13]The highest prevalence of diabetic nephropathy has been observed in Korea (56.5%) while the lowest in Pakistan (24.2%)[14].

The American Diabetes Association recommends that positive tests should be reconfirmed due to the remarkable day-to-day variability[14]. Many of the patients who had been diagnosed as cases of diabetic nephropathy did not have knowledge that diabetes mellitus had affected their kidney. So it is suggested that meticulous screening for diabetic nephropathy should be done as advised in guidelines for the management of diabetic renal disease.

CONCLUSION

In the light of the results obtained in this small scale study it is concluded that significant percentage of diabetic patients were found to have evidence of diabetic nephropathy at the time when chronic complications of diabetes are least expected. It is of vital importance to detect diabetic nephropathy earlier so that with appropriate treatment we can reduce morbidity and mortality.

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