Original Article

Frequency of Proteinuria in Patients with Older-Onset Diabetes Mellitus Attending Civil Hospital Karachi

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ABSTRACT

Objective: To determine the frequency of proteinuria in patients with adult-onset diabetes mellitus.

Study Design: Descriptive study

Place and Duration of Study: This study was conducted at Medical Wards of Civil Hospital Karachi from 1st November 2010 to 30th April 2011.

Materials and Methods: In this study 100 patients of adult onset diabetes mellitus were enrolled who were admitted in medical department at Civil Hospital Karachi. The duration of the study was 6 months. Diagnosed all patients with type 2 diabetes mellitus and > 40 years of age were included except for patients with urinary tract infection, haematuria, acute febrile illness, congestive cardiac failure, uncontrolled hypertension. A mid-stream urine sample was collected for the determination of UAE; Macroalbuminuria was tested first if it was found negative then urine was tested for Microalbuminuria.

Results: Out of 100 patients 55% patients had normal Albuminuria (<20 mg/liter) while 45% patients had evidence of increased proteinuria (>20 mg/liter). Out of 45 proteinuric patients, 28(62.2%) patients had evidence of Microalbuminuria (cutoff; 20-200 mg/liter) and 17(37.8%) patients had Macroalbuminuria (cutoff; >200 mg/liter)

Conclusion: The concluded that the frequency of microalbuminuria is higher than macroalbuminuria in type 2 diabetic subjects.

Key Words: Diabetes Mellitus, Microalbuminuria, Macroalbuminuria, Proteinuria, Diabetic Nephropathy

INTRODUCTION

Diabetes mellitus is a major global public health problem that is rapidly getting worse and projections of its future effect are alarming. According to the World Health Organization, diabetes mellitus affects 171 million people worldwide, and this number will rise to 366 million by 2030.[i] In Pakistan diabetes affects 5.2 million people and the number will rise to 13.8 million by 2030 [2].

Diabetic nephropathy is the leading cause of end stage renal disease and diabetes mellitus related morbidity and mortality and accounts for 30-35% of patients on renal replacement therapy [3-5]. Diabetic nephropathy is a clinical syndrome characterized by albuminuria on at least two occasions that are separated by 3-6 months. Diabetic nephropathy is defined as increased Urinary Albumin Excretion (UAE) in the absence of other renal diseases[5]. Diabetic nephropathy increases the risk of death, mainly from cardiovascular diseases[3,4].Diabetic nephropathy patients ultimately need haemodialysis and renal transplant and both of these are very expensive and hardly accessible especially in developing countries[3].

In diabetic nephropathy proteinuria is categorized into stages based on the values of Urinary Albumin Excretion (UAE); Microalbuminuria and Macroalbuminuria. Increased UAE is associated with increase in duration of diabetes, poor glycaemic control, decreased HDL-c levels, high blood pressure, dyslipidemia, genetic predisposition, smoking habits, age and male gender[3,4,6]. The diabetic nephropathy leads to End-stage renal disease and cardiovascular complications, therefore it is important to detect the nephropathy early and treat it accordingly. Thus the study will provide data of patients with proteinuria attending Civil Hospital Karachi so that the complications of diabetic nephropathy could be prevented.

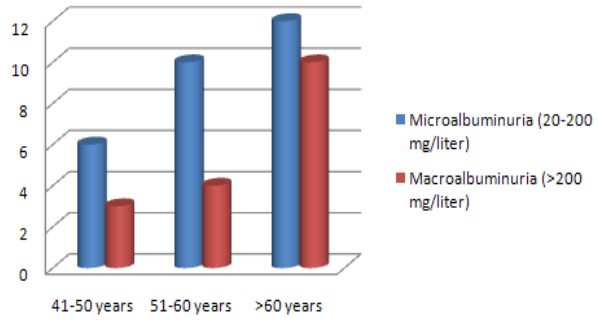
MATERIALS AND METHODS

This study was conducted at Medical wards of Civil Hospital Karachi from 1st November 2010 to 30th April 2011. This study consisted of 100 cases of diabetes mellitus admitted through the outpatient department, as well as from casualty department. Detailed history was taken from all the patients with special regard to bio-data, duration of disease, mode of treatment, history of hypertension, and complete physical examination including height, weight, body mass index (BMI), temperature and blood pressure. Inclusion criteria were that all the adults patients (Male and female) ,> 40years age of diabetes mellitus on the basis of history. Patients with urinary tract infection, haematuria, acute febrile illness, congestive cardiac failure, uncontrolled hypertension were excluded .

A mid-stream urine sample was collected for the determination of UAE; Microalbuminuria was tested by "Nephelometry Method (Beckmen Array 360 kit)"; while Macroalbuminuria by "Sulfosalicylic Acid Method of Albumin Determination". Blood samples were drawn for CBC, blood glucose levels, serum urea and creatinine levels and a chest x-ray P/A view was done assess the cardiac sizeData was analyzed through SPSS software.

RESULTS

A total of 100 patients with type 2 diabetes mellitus, above forty years of age, who fulfill the inclusion criteria, were included in this study. The average age of the patients was 55.93 ± 8.04 (95%CI; 54.34 to 57.52) Years. Out of 100 patients, there were 48% males and 52% females in this study with 1: 1.08 male to female ratio. Frequency of proteinuria according to age and gender are shown in Chart 1, 2.



Pearson Chi-Square = 1.13 DF= 2 P=0.56
Chart No.1: Proteinuria According to age.

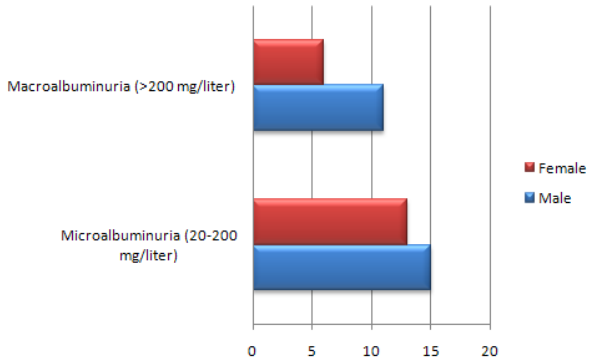


Chart No.2: Proteinuria According to Gender

In fifty-eight percent patients the duration of diabetes mellitus from the date of diagnosis was within ten years while in remaining 42% patients the duration of diabetes mellitus was more than ten years. Out of 100 patients 55% patients had normal Albuminuria (<20 mg/liter) while 45% patients had evidence of increased proteinuria (>20 mg/liter). Out of 45 proteinuric patients, 28(62.2%) patients had evidence of Microalbuminuria (cutoff; 20-200 mg/liter) and 17(37.8%) patients had Macroalbuminuria (cutoff; >200 mg/liter)

Out of 45 proteinuric patients, 20 patients were suffering from diabetes for less then ten years and 25 patients were having diabetes for more then ten years from the date of diagnosis.

DISCUSSION

Diabetic nephropathy is the leading cause of end-stage renal disease world wide and diabetes mellitus related morbidity & mortality and constitutes the major workload of dialysis centers[3]. Microalbuminuria is the first clinical evidence of kidney involvement and the process is potentially reversible at this microalbuminuric stage [3,4]. Microalbuminuria is also strongly associated with other cardiovascular risk factors and cardiovascular complications[7].

In our study out of hundred patients 55 patients (55%) were found to have normoalbuminuria while microalbuminuria and macroalbuminuria was present in 28(28%) and 17(17%) patients respectively. These study results are comparable with study conducted by Zeeshan[8] at Agha Khan University Hospital showing normoalbuminuria 58%, microalbuminuria 26% and macroalbuminuria 16%. While in other international studies prevalence of proteinuria was different. Rossi et al[9] showed microalbuminuria in 19.1% and macroalbuminuria in 3.5% patients. These differences in results in my and above studies are because of difference in sampling technique, various assays used for detection of microalbuminuria, control of diabetes, difference in inclusion criteria, difference in definition of albuminuria, life style modifications and different population studies etc.

In ourstudy out of forty-five proteinuric patients 26 were male and 19 were female. Male were slightly more affected than female but the proportion was not statistically significant (P value=0.46). However local study done by Rizwana Muzaffar et al [10] at Lahore showing no relation of gender with proteinuria. Another local study by Hashim et al[ii] also showed no association of gender with proteinuria. Age is considered one of the important factors affecting the development of proteinuria in diabetic patients; as the age progress the level of proteinuria also increase. In my study, no significant relationship was found between age and the development of proteinuria (P value=0.56). This correlates with the study done by Hashim et al [11].

Duration of disease in diabetics also affect the development of proteinuria. In my study it was observed that duration of diabetes mellitus has no effect on the frequency of proteinuria (P value=0.34). This study correlates with the local studies by Asma et al[12] at Bahawalpur, Hashim et al[11] at Lahore and Ghafoor F et al[13] who found no significant association between duration of diabetes and proteinuria.s

CONCLUSION

The frequency of microalbuminuria is higher than macroalbuminuria in type 2 diabetic subjects. All patients with microalbuminuria are prone to develop macroalbuminuria and hence overt nephropathy leading to end-stage renal failure and related cardiovascular complications. No significant association of age, gender and duration with the development of proteinuria was found in diabetic patients.

Recommendations:

All diabetics should be screened for microalbuminuria at the first presentation and then after every six months so if they found to have microalbuminuria in their urine, they should be subjected to appropriate treatment to retard the progression of nephropathy and associated complications.

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