ORIGINAL ARTICLE

Frequency of Microalbuminuria in Diabetic Patients Presenting to Diabetic Clinic Nishtar Hospital, Multan

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ABSTRAST

Aim: To determine the frequency of micro albuminuria in diabetics.
Study design: Descriptive, cross sectional, prospective and analytical study. 2327 outdoor type-I & type-II diabetics were screened for micro albuminuria.
Setting:-Diabetes research center Nishtar Hospital, Multan.
Results: There were 2327 total patients. Males were 1024 and females were 1303. Females are more in this study. Frequency of micro albuminuria was 1043(44.8%) patients had micro albuminuria. 587 (56.3%) females were micro albuminuria. 456(43.7%) males hadmicro albuminuria. Females were found to have more frequency of micro albuminuria than males. Incidence of micro albuminuria was highest in patients having diabetes with duration 5-10 years (64%). The lowest prevalence was found in patients with duration of diabetes less than 1 year (14.8%).
Conclusion: This study has documented higher frequency of micro albuminuria in diabetics in our society. Poor glycemic control and delay in diagnosis of diabetes mellitus were the factors in the development of early diabetic nephropathy.
Keywords: Diabetes mellitus, micro albuminuria, poor glycemic control

INTRODUCTION

Diabetes mellitus is the most common metabolic syndrome disorder characterized by chronic hyperglycemia and disturbances of carbohydrate, fat, and protein metabolism on account of absolute or relative deficiency of insulin secretion or action. The prevalence of diabetes in Saudi Arabia is 34.1% in males and 27.6% in females[1].The prevalence of MA in patients with type II diabetes has been reported from 20% to 61%[2].

In our country diabetes mellitus causes a significant financial and social burden. Diabetes is one of the leading causes of morbidity and mortality. The eyes, brain, heart and the kidneys are amongst the chief organs affected. The development of diabetic nephropathy is characterized by progressive increase in the excretion of protein particularly albumin, an early and continuing rise in systemic blood pressure and late decline in GFR leading to end stage renal disease[3].Micro albuminuria is defined as the urinary albumin excretion rate in 24 hours urine or short time collected urine during daytime in the range of 30-300mg/24 hours (20-200 micrograms/min).

The incidence and prevalence of end stage renal failure from renal involvement in diabetics has recently increased in the western world and in Asia[4,5]. The reason for recent increase in the frequency of nephropathy in diabetics includes; an increasing prevalence of type-II diabetes, aging of the population and improved survival of patients with type-II diabetes. Today patients live longer with type-II diabetes to experience diabetic nephropathy. Death due to renal disease is 17 times more common in diabetics than in non-diabetics. It is now established that in both type-I & type-II dm micro albuminuria is predictive of morbidity and mortality due to renal complications and cardiovascular disease. The renal risk in diabetes is associated with overt or covert albuminuria[6,7].

Micro albuminuria precedes overt proteinuria by several years, a potentially reversible state. Recently importance of micro albuminuria has been raised because its appearance in diabetics predicts development of macro albuminuria and coronary artery disease. Progression of diabetic nephropathy in diabetic individuals with micro albuminuria has been reported to be retarded by good glycemic control. In addition tight blood pressure control also has been noted to reduce micro albuminuria, particularly with the use of ace-inhibitors[8,9].

MATERIAL AND METHODS

The descriptive, cross sectional, prospective and analytical study was carried out in the Department of Diabetes Research Centre, Nishtar Hospital, Multan. A total of 2327 outdoor diabetics were screened for micro albuminuria. Both males and females diabetics attending diabetes outdoor clinic were included in the

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study and the patients with congestive cardiac failure, urinary tract infection, chronic obstructive pulmonary disease and pregnant diabetics were excluded from study.

Detailed history was taken from every patient and meticulous clinical examination performed on each of them. Diabetes mellitus was confirmed by fasting and random hyperglycemia. Routine investigations like complete blood examination, complete urine examination, x-ray chest, lipid profile and renal parameters were obtained for each patient.

Micral test was used for detection of micro albuminuria. Micral test strip is a semi quantitative test in which color reaction is mediated by an antibody boundenzyme. Micral test strip is dipped in urine for 5 seconds upto the blue area marked on test strip, strip is not touched with the vessel wall as it will result in uneven chromatography as well as loss of antibodies.

RESULTS

Frequency of microalbuminuria was 1043(44.8%) patients had microalbuminuria, out of which (56.3%) females were microalbuminuric and 456 (43.7%) males had microalbuminuria females were found to have more frequency of microalbuminuria than males as shown in table-1.

Table-1: Distribution of sex

Gender	Frequency	%age
Male	456	43.7
Female	587	56.3
Total	1043	100.0

Frequency of microalbuminuria is significantly associated with the duration diabetes mellitus. It is quite low (14.87%) with duration of dm <1 year and progressively rises to 64.4% with duration up to 5-10 years. With duration of dm >10 years it shows a little bit decline (54.5%). This decline is probably associated with higher mortality which is common when the patient has longer duration of diabetes mellitus (Table 2).

Table 2: Microalbuminuria in patients and duration of diabetes mellitus

Duration	Frequency	%age
<1year	73/492	14.8
1-5 years	346/817	42.4
5-1- years	449/697	64.4
>10 years	175/321	54.5

Good glycemic control was seen only in few numbers of patients and they were having relatively lower frequency of microalbuminuria, while it was significantly higher in patients with poor glycemic control as shown in table-3.

Total cholesterol, triglycerides and HDL were assessed in patients having microalbuminuria. It shows no significant correlation between deranged lipid profile and microalbuminuria. Data for LDL was not fully available (Table-4).

Frequency of microalbuminuria and blood pressure control was assessed in diabetics. It has been found that with good blood pressure control frequency of microalbuminuria was less in diabetics as compared to poor blood pressure control as shown in table-5.

Table 3: Microalbuminuria in patients and blood sugar levels

Level	Frequency	%age
FBS <110	19/51	73.3
FBS >110	263/602	43.7
RBS <140	55/153	41.4
RBS >140	830/1783	46.6

Table-4: Microalbuminuria in patients and lipid profile

Lipid	Frequency	%age
S.Chol<180	217/402	54.0
S.Chol>180	263/602	43.7
S.TG <150	95/167	56.9
S.TG >150	220/439	50.3
HDL >40	238/454	52.4
HDL <40	236/454	52.2

Table 5: Frequency of microalbuminuria with blood pressure

Blood pressure	Frequency	%age
SBP <130	285/686	41
SBP >130	615/1305	47
DBP <90	280/685	40.7
DBP >90	625/1385	47.8

DISCUSSION

A statistically significant correlation was found between the prevalence of MA and females, BMI, presence of hypertension, duration of diabetes, HbA1c, fasting plasma glucose, and LDL. Several epidemiological studies have reported the prevalence rates of MA as ranging between 20% and 61% in patients with type II diabetes[2,10,11]. This variation in the prevalence of MA can be attributed to several factors such as differences in populations, the definition of MA, the methods of measurement and urine collection.

A study conducted in mainland china published in Zhonghuaneikezazhi 2007, march for prevalence of microalbuminuria in type-2 diabetics 2473 patients were included in this study. Frequency of microalbuminuria was 42.9%. Microalbuminuria prevalence study (maps) was conducted in Hong Kong and published in Hong Kong med J 2006 June. Total patients were 437. Frequency of

microalbuminuria was 24.9%. Microalbuminuria prevalence study (maps) conducted in Singapore published. Total patients included were 5549. Frequency of microalbuminuria was 39.8%. Frequency of microalbuminuria in our study was quite high (44.8%) but it is comparable to mainland china study (43%) and maps study (40%). In contrast to Hong Kong study (24%) these values are quite high. Probably there are multiple factors involved for this higher frequency in our study poor glycemic control, delay in the diagnosis of diabetes mellitus, longer duration of diabetes mellitus at presentation and poor blood pressure control.

No statistical correlation was found between the prevalence of MA and the age of patients in the present study, a result which is similar to what was reported in another study[12]. However, some studies found a statistical correlation between age and MA[2]. These variations are probably related to the varied distribution of patients' ages in the different studies.

The present study found a statistical correlation between the prevalence of MA and presence of diabetic retinopathy and neuropathy, similar to other reported studies[13]. No statistical correlation was found between the prevalence of MA and presence of coronary artery disease. However, some studies have found a statistical correlation between cardiovascular disease and MA[14,15]. This difference may be due to poor documentation in our medical files and the possible distortion of percentages by the smallness of the population.

In the present study, a statistically significant correlation was found between the prevalence of MA and HbA1c, which was similar to findings reported by other studies[16]. However, in another study, there was no significant association of MA with HbA1c, but there was a strong association with fasting glucose, which is similar to an earlier study[17]. Hyperglycemia is associated with an increase in mesangial cell proliferation and hypertrophy, as well as increased matrix production and basement membrane thickening[18]. Thus, tight glycemic control and monitoring on a regular basis should be the primary goal for any patient with diabetes.

CONCLUSION

This study has documented higher frequency rates in type 2 diabetics in our society. Poor glycemic control and delay in the diagnosis of dm were the factors in the development of early diabetic nephropathy.

RECOMMENDATIONS

- Screening for early detection of dm as well as microalbuminuria.
- Good glycemic control.
- Smoking cessation.
- Good blood pressure control.
- Use of ace-i can halt the progression of microalbuminuria to macro albuminuria and frank nephropathy.

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