

FREQUENCY OF PROTEINURIA AND ITS KNOWN RISK FACTORS IN 100 PATIENTS OF DIABETES MELLITUS

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ABSTRACT

Objective: To find out the frequency of proteinuria and its known risk factors (duration of diabetes, status of glycaemic control and concurrent hypertension) in diabetics.

Material and Methods: This hospital based observational study was carried out from November 2003 to May 2004, at Medical A Unit Khyber Teaching Hospital Peshawar. A total of 100 patients were selected through non-probability purposive type sampling. All established diabetics were included irrespective of the type of diabetes, age and sex. Questions were asked regarding the type and duration of diabetes. Blood pressure of each patient was measured. Glycosylated hemoglobin (HbA1c) and 24 hours urinary protein were done to assess the glycaemic status and proteinuria.

Results: Seventy-one patients (71%) had macroalbuminuria (overt nephropathy). Twenty-nine patients (29%) had microalbuminuria (incipient nephropathy). Duration of diabetes in 79 (79%) of the patients was less than 10 years with a mean duration of 7.4 (\pm 5.01). Seventy nine (79%) of the patients had HbA1c of greater than 7% and mean HbA1c was 8.59 (\pm 1.82). Hypertension was present in 37 % of the patients.

Conclusion: Majority of the patients had overt nephropathy (macroalbuminuria). Most of the patients had relatively shorter duration of diabetes. Diabetes was uncontrolled in the majority of the patients and hypertension was present in around one third of the patients.

Key words: Diabetes Mellitus, Diabetic Nephropathy, Risk Factors, Proteinuria.

INTRODUCTION

Diabetic nephropathy (DN) is one of the important microvascular complications of diabetes mellitus. It is responsible for 25 % cases of uremia.¹ Microalbuminuria is a predictive factor for cardiovascular events in type II diabetics and of nephropathy in type I diabetics.^{2,3} It develops over a series of phases from microalbuminuria and macroalbuminuria to progressive decline in glomerular filtration rate. This ultimately results in renal failure^{1a}. Duration of diabetes mellitus, poor glycaemic control and hypertension are the main risk factors for DN. The importance of glycaemic control in preventing DN has been stressed in various studies including United Kingdom Prospective Diabetes Study.^{5,6} Angiotensin converting enzyme inhibitors (ACEI) decrease proteinuria in diabetic patients and revert microalbuminuria to normalalbuminuria. However, DN cannot be prevented beyond the stage of macroalbuminuria. Various studies like Hypertension Outcome Prevention Evaluation (HOPE) study and European Study for Prevention

of Renal disease in Type I diabetes (ESPIRIT) recommend aggressive treatment of hypertension with ACEI to prevent diabetic nephropathy.^{7,8} Thus DN is a preventable disease.

The aims of the study are to find out frequency of proteinuria and its known risk factors. The operational definition of known risk factors included duration of diabetes, concurrent hypertension and status of glycaemic control.

MATERIAL AND METHODS

This was hospital based descriptive study performed at Medical A unit, Khyber Teaching Hospital Peshawar. Sampling was of non probability purposive type. A total of 100 diabetic patients were included in the study.

The selection criteria were as following:

1. Established diabetes mellitus patients, irrespective of the type, age and sex of the patients were included.
2. Patients with urinary tract infection and

DURATION OF DM, GLYCEMIC STATUS AND HYPERTENSION

| Type of DM | Duration | | Glycemic status | | Hypertension | |
|-----------------|------------|------------|-----------------|------------|--------------|------------|
| | <10 years | >10 years | HbA1c<7% | HbA1c>7% | Present | Absent |
| Type II n=81 | 61(75.30%) | 20(24.69%) | 18(22.22%) | 63(77.77%) | 37(37%) | 44(54.32%) |
| Type I n=19 | 18(94.73%) | 1(5.26%) | 3(15.78%) | 16(84.21%) | 0 | 19(100%) |
| Total n=100 | 79(79%) | 21(21%) | 21(21%) | 79(79%) | 37(37%) | 63(63%) |

Table 1

glomerulonephritides were excluded from the study.

Besides demographic informations, questions were asked about duration of diabetes and history of hypertension. Patients were labeled hypertensive if there was any past history of hypertension or if two readings were greater than 140/90 mm Hg. HbA1c and 24 hours urinary protein were done to assess glycemic status and proteinuria. Patients with HbA1c of less than 7 % were labeled as having good glycemic status and those with level more than 7 % were labeled as having bad glycemic status. Proteinuria was graded as follow:

Normalbuminuria= <30 mg /24 hours

Microalbuminuria=30-300 mg/24 hours.

Macroalbuminuria= >300 mg/24 hours.

All the information as recorded on proforma. At the end whole data was entered and analyzed through SPSS windows 10.0 and mean, percentages and standard deviation were calculated for various variables.

RESULTS

Out of 100 patients, 81(81%) were type II diabetics and 19 (19%) were type I diabetics. Fifty-eight (58%)patients were female and 42(42%) were male. Mean age was 48.17 (SD ± 14.86).

Mean duration was 7.42 (SD ± 5.01) and mean HbA1c was 8.59 (± 1.82). Seventy-nine patients (79%) were having diabetes for less than 10 years. Seventy-nine patients (79%) had HbA1c >7%. Thirty-seven patients (37%) had concurrent hypertension (Table-1). All patients (100%) had elevated urinary protein. Out of these 71% patients had macroalbuminuria and 29 % had microalbuminuria (Table-2).

DISCUSSION

Nephropathy is a predictor and cause of morbidity and mortality in diabetes mellitus^{2,3}. It is a preventable phenomenon. Good glycemic control, aggressive treatment of hypertension with ACE Inhibitors, treatment of dyslipidemia, correction of dehydration, avoidance of nephrotoxic drugs and aggressive treatment of urinary tract infection are the keys to success^{5,7-10}.

Our study showed interesting trends. Majority of the patients had relatively less duration of diabetes, poor glycemic status and macroalbuminuria. Hypertension was present in significant number of patients. These are very alarming facts. These findings could be due to late detection of disease, lack of education about the disease, poor monitoring and failure on part of doctor to screen for complications. As a result, patients are getting complication at an early stage.

In our study majority of the patients (79%)

STATUS OF PROTEINURIA

| Type of Diabetes Mellitus | Microalbuminuria | Macroalbuminuria |
|---------------------------|------------------|------------------|
| Type II n=81 | 22(27.16%) | 59(72.83%) |
| Type I n=19 | 7(36.84%) | 12(63.15%) |
| Total n=100 | 29(29%) | 71(71%) |

Table 2

had diabetes less than 10 years. This is in contrast to the finding of Ahmad et al (1998) at Jinnah Postgraduate Medical Centre, Karachi¹¹. They showed that majority of the patients (56%) were having diabetes for greater than 10 years. Most of the patients (79%) had bad glycemic control, which is comparable to that reported by Basit et al¹². They found uncontrolled diabetes in 81% Hypertension had been reported in 13-71% in various studies in the country, which is comparable to the results of this study.¹³⁻¹⁵ Thus glycemic status is poorly controlled throughout country and a bulk of patients is having hypertension. However, majority of patients in our part of the country has shorter duration of diabetes. This could be either due to late detection or an aggressive course of diabetes in this part of the country.

Most of our patients (71%) had macroalbuminuria. This is in marked contrast to other studies conducted locally and internationally. Macroalbuminuria had been reported as 4-51%¹³⁻¹⁷ and 11-36%¹⁸⁻²⁰ respectively in the country and abroad. This means that all of our patients had some renal involvement either in the form of incipient nephropathy or overt nephropathy in a short span of time.

From this study, emerges a picture of diabetics with short duration of disease, poor glycemic status, significant hypertension and overt nephropathy. This is a threatening scenario where either due to late detection of disease, poor compliance or inadequate monitoring of disease, patients are developing complications at an early stage of the disease.

CONCLUSION

This study concludes that most of our patients develop diabetic nephropathy in a short span of time due to poor glycemic control and associated hypertension. Pakistan being a poor country, cannot provide dialysis and renal transplant facility to every patient so strategy of early detection, meticulous control of diabetes and hypertension and early screening for complications should be adopted. Only then we will be able to avoid costly business of dialysis, renal transplant and coronary revascularization surgery.

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