Original Research Article

Frequency of Proteinuria in Newly Diagnosed Diabetic Patients Presenting to the Medicine Ward of District Head Quarter Hospital, Dera Ismail Khan

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Abstract: *Diabetic nephropathy can develop early in the course of diabetes mellitus, often presenting initially as proteinuria and contributing significantly to long-term morbidity.* **Objective:** *To determine the frequency of proteinuria in newly diagnosed diabetic patients presenting to the medicine ward of the district headquarters hospital, Dera Ismail Khan.* **Methodology:** *The present study was conducted on 210 patients aged 30 to 75 years who were newly diagnosed with diabetes mellitus; diabetes was confirmed on two separate fasting plasma glucose tests with fasting glucose >126 mg/dL. Patients were assessed for proteinuria, which was defined as protein excretion greater than 150 mg/day. SPSS 26 was used for analysis. Associations were evaluated using the Chi-square test, with p-values < 0.05 considered significant.* **Results:** *The Mean age of the cohort in the present study was 52.46±13.51 years. The majority of the cohort was male (58.1%). Hypertension was observed in 42.9% cases. Proteinuria was diagnosed in 92 (43.8%) cases. Proteinuria was significantly associated with older age (p = 0.008) and hypertension (p = 0.0001).* **Conclusion:** *A high frequency of proteinuria (43.8%) was found among newly diagnosed diabetic patients presenting to the medicine ward. Older age and hypertension were significantly associated with proteinuria in the present study.*

Keywords: Diabetes Mellitus, Proteinuria, Renal disease, Hypertension

Introduction

Diabetes mellitus (DM) is a metabolic disorder characterized by elevated blood glucose levels. It encompasses multiple types, i.e, type 1 diabetes, type 2 diabetes, and gestational diabetes, neonatal secondary to endocrinological disorders or extended steroid therapy. (1,2) Type 1 and type 2 DMs are major categories and are mainly associated with insulin deficiency. DM affects individuals worldwide, approximately 462 million contributing 6.28%. (3) Sustained hyperglycemia, along with related abnormalities in carbohydrate and lipid metabolism, negatively influences the multiple organ systems as well as disturbs their usual physiological functionalities. (4) Such pathological changes arise progressively. They are mainly attributed to the toxic effects of prolonged elevated blood glucose, along with the associated metabolic derangements, predominantly in the microvascular and macrovascular systems, which play a significant role in organ development and function. (4)

Proteinuria is the presence of abnormal quantities of protein within the urine and includes albumin, globulins, and mucoproteins. (5) It occurs due to the alterations in the renal glomerular filtration barrier. At the same time, it can also occur in certain transient conditions, in addition to serving as a marker of early kidney disease. The estimated glomerular filtration rate (eGFR) is increasingly used for classifying and staging chronic kidney disease. (6,7) In individuals with diabetes mellitus, proteinuria is one of the significant factors of diabetic kidney damage. It is linked with the elevated risk of progression to renal disease known as end-stage renal failure. (8) A study reported that 64% of newly diagnosed diabetic patients exhibited proteinuria. (9)

Monitoring proteinuria enables early detection of renal impairment, allowing timely interventions to halt the progression of diabetic kidney disease. Due to the scarcity of local literature on this subject, the goal of this study is to determine the frequency of proteinuria among newly diagnosed diabetic patients presenting to the medicine ward of the district headquarters hospital in Dera Ismail Khan. The results of this study will help our medical professionals in early detection of kidney damage, assessing disease progression, optimizing treatment responses, and ensuring quality care. Incorporating routine proteinuria monitoring into clinical practice will contribute to better outcomes, improved patient safety, and enhanced overall management of patients with diabetes.

Methodology

This cross-sectional study was conducted (28-04-2024--28-10-2024) in the Department of Medicine, District Head Quarter Hospital, Dera Ismail Khan. Ethical approval was obtained from the hospital's IRB (No. 86/GJMS). A sample of 210 patients was selected for this study, based on the previous frequency of proteinuria in newly diagnosed patients (64%) (9), with an absolute precision of 6.5% and a 95% confidence interval. A non-probability consecutive sampling technique was used.

Eligible patients were 30 to 75 years old, of either gender, and newly diagnosed with diabetes. Newly diagnosed diabetes was defined as patients with no existing history of diabetes with all of the following symptoms: excessive urination, polydipsia, and fatigue. Two separate fasting plasma glucose tests were performed, each showing a fasting glucose >126 mg/dL. Diagnosis will be performed by conducting the 2 separate fasting plasma glucose blood assessments. Each assessment shows a fasting glucose >126 mg/dL. Patients with known renal failure, acute febrile illness, and heart disease were excluded.

All the patients were informed and briefed about the study. Each patient gave their consent to participate in the study. Demographics such as age, BMI, gender, educational status, employment status, socioeconomic background, and residential area were recorded. Patients newly diagnosed with diabetes mellitus were assessed for proteinuria using urine samples. A urine sample was collected in a clean container, the lid was tightly closed, and the container was sent to the hospital for laboratory assessment. Proteinuria was labelled positive if urinary protein excretion was greater than 150 mg/day; the patients also exhibited symptoms such

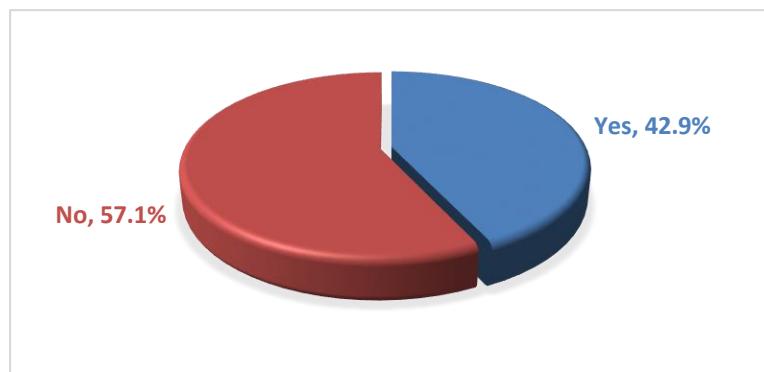as foamy/bubbly urine, Swelling (edema) in the face/hands/feet, and fatigue.

SPSS 26 was used for data analysis. Frequencies and percentages were calculated for categorical data, including gender, proteinuria, hypertension, education status, employment status, socioeconomic background, and residence area. Mean + SD or Median were determined for numerical data, such as age, BMI, and urine protein level. Age, BMI, gender, hypertension, educational status, employment status, socioeconomic background, and residential area were stratified for Proteinuria. A post-stratification Chi-square test was applied, with p-values < 0.05 considered significant.

Results

The mean age of 210 newly diabetic patients in this study was 52.46 ± 13.51 years. Their mean body mass index (BMI) was 26.73 ± 2.09 kg/m², and the mean urinary protein level was 152.24 ± 13.89 mg/day.

There were 122 (58.1%) male and 88 (41.9%) female patients in this study. Most of the patients, 127 (60.5%), were uneducated. Unemployed patients were 124 patients (59.0%) of the cohort. One hundred sixteen patients (55.2%) lived in urban areas. Eighty-three patients (39.5%) were from the lower class, while 85 (40.5%) were from the middle class (Table 1). Hypertension was present in 90 patients (42.9%) (Figure 1). Proteinuria was found in 92 (43.8%) patients (Table 2).

A significant association was observed between proteinuria and increasing age (P = 0.008). The frequency of proteinuria was also significantly higher in patients with hypertension (P = 0.0001). No statistically significant association of proteinuria was found with gender, socioeconomic status, educational status, employment status, residence, and BMI (Table 3).

Table 1: Demographics

Demographics		n	%
Gender	Male	122	58.1%
	Female	88	41.9%
Education status	Educated	83	39.5%
	Uneducated	127	60.5%
Employment status	Employed	86	41.0%
	Unemployed	124	59.0%
Residence area	Urban	116	55.2%
	Rural	94	44.8%
Socioeconomic status	Lower class (> 50K)	83	39.5%
	Middle class (50K to 100K)	85	40.5%
	Upper class (> 100K)	42	20.0%

Figure 1: Frequency of hypertension

Table 2: Frequency of proteinuria

Proteinuria	n	%
Yes	92	43.8%
No	118	56.2%

Table 3: Association of proteinuria with various parameters

Parameters		Proteinuria				P value
		Yes		No		
		n	%	n	%	
Age distribution (Years)	30 to 45	26	28.3%	55	46.6%	0.008
	46 to 60	24	26.1%	31	26.3%	
	> 60	42	45.7%	32	27.1%	
Gender	Male	53	57.6%	69	58.5%	0.90
	Female	39	42.4%	49	41.5%	

Education status	Educated	39	42.4%	44	37.3%	0.45
	Uneducated	53	57.6%	74	62.7%	
Employment status	Employed	39	42.4%	47	39.8%	0.70
	Unemployed	53	57.6%	71	60.2%	
Residence area	Urban	55	59.8%	61	51.7%	0.24
	Rural	37	40.2%	57	48.3%	
Socioeconomic status	Lower class (> 50K)	41	44.6%	42	35.6%	0.23
	Middle class (50K to 100K)	37	40.2%	48	40.7%	
	Upper class (> 100K)	14	15.2%	28	23.7%	
Hypertension	Yes	55	59.8%	35	29.7%	0.0001
	No	37	40.2%	83	70.3%	
BMI (Kg/m2)	18 to 25	24	26.1%	29	24.6%	0.80
	> 25	68	73.9%	89	75.4%	

Discussion

The demographic profile of the present study showed that the mean age was 52.46 years, which is notably higher than the 43.01 years reported by Rahman et al., but lower than the 59.7 years reported by Dimple et al. (10,11). This age disparity may reflect differences in population health, delay in Diagnosis, or differing inclusion criteria of the studies. In the present study, males constituted the majority, at 58.1%, which aligns closely with other studies conducted in Pakistan. (10,12) This consistency suggests a regional pattern in gender presentation for newly diagnosed diabetes. However, this finding contrasts with that of Aboelnasr et al. (2020), who reported that females constituted the majority in their cohort. (13)

The mean BMI in the present study was 26.73 kg/m², which puts the majority of the cohort in the overweight category. This finding is similar to the aforementioned Pakistani studies. (10,12) Aboelnasr reported a higher mean BMI of 31.7 kg/m². (13) These observations suggest that higher BMI is typical in newly diagnosed diabetics.

The frequency of proteinuria in the current study was 43.8%. This finding is similar to the 40% reported by Rahman et al. and 40.5% reported by Khan et al. (10,12). A study conducted in India by Dimple et al. reported a 36.1% prevalence of proteinuria. (11) Aboelnasr reported a 45.75% frequency of proteinuria. (13)

The subgroup analysis further revealed a significant association between hypertension and proteinuria. The majority of the patients diagnosed with proteinuria were hypertensive. This association has been reported by Khan et al., who found 48.3% of their hypertensive patients had proteinuria. (12) Aboelnasr et al. also reported hypertension as a significant factor in their nephropathy group. (13) This consistent finding underscores a dangerous combination of diseases.

A significant association between proteinuria and advancing age was also found. Patients aged 60 years or older were more frequently represented in the proteinuria cohort. This aligns with the work of Khan et al. (2025) and supports the concept of cumulative metabolic insult. The present study did not find significant associations between proteinuria and BMI; however, proteinuria was more prevalent in the BMI> 25 kg/m2 group. Aboelnasr et al. identified obesity as a risk factor. This difference might be due to the fact that most patients were overweight.

From the above discussion, it is suggested that newly diagnosed patients of diabetes should be screened routinely for proteinuria, especially elderly patients and those with elevated systolic and diastolic BP. Newly diagnosed diabetics should also be monitored for hypertension, as it can lead to the excretion of urine protein.

Several limitations of the present study must be considered. The present study had a cross-sectional design, which records data at a single moment and can limit conclusions about causation or progression. The present study was conducted in a single centre, which may introduce selection bias and limit generalisability to other study settings. Data on lipid profiles were not collected for this study, which is also linked to renal outcomes, as identified by Sacks et al. (13). Future studies should be conducted in multiple centers with a prospective design. It should incorporate the aforementioned limitations.

Conclusion

In conclusion, the present study found a significant burden of proteinuria (43.8%) among newly diagnosed diabetic patients presenting to the medicine ward. The analysis identified older age and hypertension as significantly associated with proteinuria in this cohort. Routine screening of proteinuria is recommended in newly diagnosed diabetic patients.

Declarations

Conflict of interest

The authors declared no conflict of interest.

Author Contribution

NU (PGR)
Data Collection, Study Design, Data Analysis and Manuscript Drafting.
IUM (Professor)
Review of Literature, Critical Guidance, Conception of Study Design
AK (Associate Professor)
Conception of Study and Development of Research Methodology Design

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the study's integrity.

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