Original Article

Frequency of Renal Diseases in Diabetic Patients

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Abstract:

Diabetic nephropathy, also known as diabetic kidney disease is the chronic loss of kidney function occurring in those with diabetes mellitus. Diabetic nephropathy is one of the leading causes of chronic kidney disease (CKD) and end-stage renal disease (ESRD) globally. Protein loss in the urine due to damage to the glomeruli may become massive, and cause a low serum albumin with resulting generalized body swelling (edema) and result in the nephrotic syndrome. **Objective:** The aim of this study was to determine the frequency of renal disease in diabetic patients and its complications in Pakistan. **Methods:** A cross sectional study was conducted at Renal and Diabetic Departments of the Sir Ganga Ram Hospital, Lahore, over a period of 3 months, after obtaining the ethical approval from The University of Lahore. A total number of 100 Diabetic patients were selected through non probability convenient sampling technique. Patients of both sexes and all age groups were included. **Results:** In this study 60% were male and 40% were female. About 41% diabetic patients were 1-6 month of age, 42% were 1-5 years old and 1% of 18-23 years old who had renal diseases while 9% patients were without any renal disease. whereas the prevalence of diabetes is more in infants than others which is 35%. But there was not significant association between onset of renal diseases with the onset of diabetes mellitus with p-value 0.24.

Conclusions: Results of current study showed that diabetes mellitus effecting individuals of all ages equally but there was not significant association between diabetes and renal diseases.

Key words: Diabetes mellitus, renal disease, Nephropathy

Introduction

Nephropathy is a condition characterized by increased albumin level in urine, high arterial blood pressure, a decline in renal function and increased cardiovascular abnormalities[1]. There are about 10±40% of Diabetic patients (Type I) who have Nephropathy and kidney disorders [2, 3]. However, a strict control on blood glucose level vanished the risk of microvascular complications caused by diabetes [4], the progression of diabetic nephropathy cannot be explained by poor glycaemic control exclusively [5]. On the other hand in some cases diabetic nephropathy cannot be defined by shared environmental factors alone. Whereas, the relative quantity of family studies have showed an excess of cardiovascular diseases [6] and hypertension in family of diabetic patients[7]. That's why, significant evidence evaluates a role of genetics in the development of diabetic nephropathy [8]. Now Diabetes Mellitus is considered as the main cause of kidney diseases. Both developed and developing countries are facing increased prevalence of diabetes and diabetic nephropathy rapidly.. In the United States, 43% and 8% patients are suffering from microalbuminuria and macroalbuminuria respectively. Moreover, the prevalence of kidney failure is about 45% [9]. Poor preventive opportunities and insuffient care of patients with diabetes and Diabetic kidney diseases (DKD) leads towards further progression of disease such as kidney failure. Nevertheless, diabetes

care has improved as the advantage of fastidious management have become widely accepted and the use of angiotensin receptor blockers (ARBs), statins and angiotensin-converting enzyme (ACE) inhibitors has been increased in patients with diabetes.4 Even so, less than 1 in 4 patients with diabetes takes at least 1 lipid test, at least 1 hemoglobin A1c (HbA1c) test and at least 1 glucose testing strip each year, reflecting the requirement for better assessment of these high-risk patients [10].

Diabetic nephropathy is defined by protein-uria and known as the primary cause of End stage renal disease. It is also reasoned the earliest evidence of the kidney damage in patients with diabetes. Whereas the relative incidence of diabetes mellitus is increasing globally. The aim of this study is to find out the accessible data on diabetes and diabetic nephropathy. This will sooner or later help to create knowledge and awareness for both government and health care departments towards the substantive importance of care, appropriate management and prevention of both DM and KD.

Methods:

A cross sectional study was conducted at Renal and Diabetic Departments of the Sir Ganga Ram Hospital, Lahore, over a period of 3 months, after obtaining the ethical approval from the The University of Lahore. A total number of 100 Diabetic patients were selected through non probability convenient sampling technique. Diabetic Patients of both sexes and all age groups were included. Data were collected through pre-tested data collection tool (questionnaire/ Proforma). Blood samples were collected from diabetic people for chemical analysis to determine the protein and Urea which diagnosed the kidney problems. Data were tabulated and analyzed with the help of SPSS version 17.0. Frequencies were calculated and Pearson chi-square test was applied to evaluate the association of Diabetes with the other risk factors. P-value less than 0.05 was considered to be significant.

Results:

In this study out of 100 patients 60% were male and 40% were female as shown in Table 1. About 41% diabetic patients were 1-6 month of age, 42% were 1-5 years old and 1% of 18-23 years old who had renal diseases while 9% patients were without any renal disease, Table 2.

Gender	Frequency	Percent
Male	60	60.0
Female	40	40.0
Total	100	100.0

Table 1: Frequency distribution of Gender

Age	Frequency	Percent	Cumulative Percent
1-6 mo	41	41.0	41.0
7-11 mo	3	3.0	44.0
12 mo-5 yr	42	42.0	86.0
6 yr-11 yr	2	2.0	88.0
12 yr-17 yr	2	2.0	90.0
18 yr-23 yr	1	1.0	91.0
No Renal Disease	9	9.0	100.0
Total	100	100.0	

Table 2: Onset of Renal Disease

Onset of Renal Disease	Onset of Diabetes					Total	p-value
	1-5 yr	6-10 yr	11-15 yr	16-20 yr	21-25 yr		
1-6 mo	19	10	5	6	1	41	0.24
7-11 mo	1	0	2	0	0	3	
12 mo-5 yr	8	13	14	4	3	42	
6 yr-11 yr	1	0	1	0	0	2	
12 yr-17 yr	1	0	0	1	0	2	
18 yr-23 yr	0	0	0	1	0	1	
NRD	5	2	1	1	0	9	
Total	35	25	23	13	4	100	

Table 3: comparison between onset of Renal Disease and onset of Diabetes, NRD, non-renal disease

Whereas the prevalence of diabetes was more in infants than others which is 35% as shown in Figure 1.

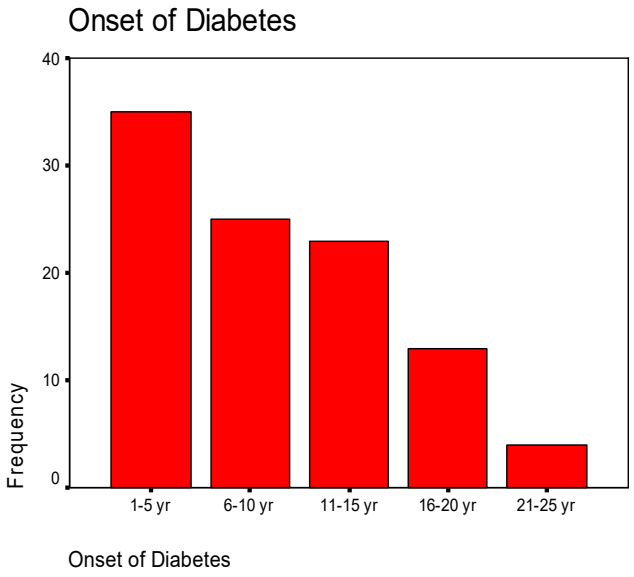

Figure 1: Onset of Diabetes

But there was not a significant association between onset of renal diseases with the onset of diabetes mellitus as p-value is 0.24, as shown in Table 3. Data analysis showed that 34% patients had 106-156mg percentage of urea, 31% had 55-105mg and 2% had 310-360 mg percentage of urea, Table 4.

Urea % (mg)	Frequency	Percent	Cumulative Percent
55-105	31	31.0	31.0
106-156	34	34.0	65.0
157-207	20	20.0	85.0
208-258	2	2.0	87.0
259-309	2	2.0	89.0
310-360	2	2.0	91.0
15-40	9	9.0	100.0
Total	100	100.0	

Table 4: Frequency distribution of urea

Discussion:

The objective of our study was to find out the frequency of renal disease in diabetic patients and its complications in Pakistan. According to current results about 41% diabetic patients between the age of 1-6 month had renal diseases and the prevalence of diabetes was more in infants than others which is 35% as shown in figure 1. In 2007, the approximate 246 million people globally were suffering from diabetes mellitus (DM) [11] and is predicted to double by 2030, [12] while death rate in low-middle income countries is eighty percent (80%) by DM. Although the prevalence rate of type 2 DM is also higher in

developed countries [13]. It has been estimated that in the next 25 years its prevalence will be doubled in the Sub-Saharan Africa and Middle Eastern Crescent[14]. Diabetic nephropathy occurs in both insulin dependant (Type I) and Non insulin dependant (Type 2) . Genetics also act as the major risk factor for the development of DM. Pathologic abnormalities are more prominent in patients with long-term diabetes prior to the onset of microalbuminuria. Main three glomeruli changes in patients with diabetic nephropathy are thicken glomerular membrane, glomeruli sclerosis and mesangial expansion [15]. Current study examined only diabetic patients who had suffered from kidney disease because of diabetes determined the correlation of onset of diabetes with renal disease. Type 1diabetes is most common in children, type 2 diabetes also seen in patients who had family history of diabetes or they are offsprings of mothers with gestational diabetes [16, 17].

However, the prevalence of DM was more common in men than women and for other complications such as retinopathy, cataract, amputation, cardiac defects, stroke and death. Total 23.6% patients had diabetic nephropathy with one co-related disease, while the remaining had much complications [18-20].

Conclusions:

No significant association was observed between diabetes mellitus and onset of renal diseases or frequency of renal diseases.

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