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EVALUATION OF ASSOCIATION OF DIABETIC RETINOPATHY AND NEPHROPATHY IN TERMS OF DURATION AT FENI DIABETES HOSPITAL, BANGLADESH

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ABSTRACT

Background: In diabetic patients' complication like diabetic nephropathy and retinopathy are commonly seen at outpatient department. **Objective:** In this study our main goal is to evaluate the association between diabetic retinopathy and nephropathy in terms of duration at Fein, Bangladesh. **Method:** This cross sectional study was carried out at Feni diabetes hospital from 2020 to 202021 where 100 type-2 diabetic patients who attended in Ophthalmology department. Diabetic retinopathy was diagnosed by retinal examination by fundoscopy and nephropathy was diagnosed by serum creatinine test in laboratory. **Results:** A total of 100 patients were evaluated. Among them male to female ratio 60:40. Majority were between 47 to 57 years age group that was 44.8 %. In addition, according to clinical status mean BMI was found 27.0±3.0 kg/m2, FBS was 7.9±2.8 mmol/l, 2hoursABF was 12.7±4.8 mmol/l, HbA1c was 7.1±1.8 %. Moreover, 80% patients had diabetic nephropathy where in diabetic retinopathy case was 100. Among diabetic retinopathy, majority were varieties (mild/moderate/severe) form of NPDR(non proliferative diabetic retinopathy). This association was occurred in duration of 15 to 20 yrs of uncontrolled diabetes malitus patients. **Conclusion:** Diabetic nephropathy has a significant association with Diabetic retinopathy in terms of a duration of 15 to 20 years of uncontrolled Type II Diabetes Malitus in Bangladesh.

KEYWORDS: Type-2 diabetes, Diabetic nephropathy, Diabetic retinopathy.

INTRODUCTION

Diabetes is one of the most prevalent and quickly growing chronic diseases in the world, and it has been dubbed a "diabetes pandemic."

Diabetes prevalence was predicted to be 2.8 percent in 2000 and is expected to rise to 4.4 percent by 2030, implying that the number of diabetics would rise from 171 million in 2000 to 366 million in 2030.[1-3]

Diabetes is becoming more common as a result of an aging population, changes in lifestyle as a result of economic growth, and rising obesity rates. Moreover, The retina and kidney problems of diabetes are both caused by damage to tiny capillaries in these organs.[4-5]

Diabetic microvascular complications can be fatal, resulting in blindness and end-stage renal failure. Some authors have discovered links between the problems, and one complication might act as a risk factor for another. Recent research has revealed that the presence of diabetic retinopathy (DR) may put people at risk for diabetic nephropathy (DN).[6]

In this study our main goal is to evaluate the association of diabetic retinopathy with nephropathy in terms of duration in Bangladesh.

OBJECTIVE

To evaluate the association of diabetic nephropathy and retinopathy in terms of duration in Bangladesh.

METHOD AND MATERIALS

This was a cross-section observational study, comprising of 100 diabetic retinopathy cases associated with diabetic nephropathy, carried out at Feni diabetes hospital from 2020 to 2021.

A total of 100 type-2 diabetic patients who attended at Ophthalmology department, included in the study who has any grade of diabetic retinopathy with or without nephropathy was included in this study. Type 2 diabetic

patients having no diabetic retinopathy as well as type-1 diabetics were also excluded from this study.

Diabetic retinopathy was diagnosed by indirect ophthalmoscopy with 78 diopter volk lens.

Retinopathy was graded as NPDR [non proliferative (mild/moderate /severe) diabetic retinopathy] and PDR (proliferative diabetic retinopathy).

Diabetic nephropathy was suspected in patients having any grade of diabetic retinopathy and then serum creatinine level of that patients was examined at laboratory and evaluated for nephropathy.

Statistical analysis was performed using the Statistical package for social science SPSS version 23.0. A descriptive analysis was performed for clinical features and results were presented as mean ± standard deviation for quantitative variables and numbers (percentages) for qualitative variables.

RESULTS

In table-1 shows age distribution of the patients where majority were between 47-57 years age group, that was 44.8%. Besides that, 32.3% cases belong to 36-46 years age group, 14.1% belong to 58-68 years age group. In addition, only 4% cases noticed in 25-35 years.

Table-1: Age distribution of the patients.

Age group	Percent
25-35 years	4.0
36-46 years	32.3
47-57 years	44.8
58-68 years	14.1
>68 years	4.7
Total	100.0

In table-2 shows clinical status of the patients where mean BMI was found 27.0±3.0 (kg/m^2), FBS was 7.9±2.8 mmol/l, 2hours ABF was 12.7±4.8 mmol/l, HbA1c was 7.1±1.8 %, systolic blood pressure was 137.8±21.7 mmHg,diastolic blood pressure was found 82.9±11.9, triglycerides was 180.9±97.2 mg/dl, total cholesterol was 193.1±31.6 mg/dl, LDL was 105.7±34.3 mg/dl, serum creatinine was 1.9±0.9 mg/dl. The following table is given below in detail:

Table 2: Clinical status of the patients.

Clinical status	Mean ± SD
BMI	27.0±3.0 kg/m2
FBS	7.9±2.8 mmol/l
2hours ABF	12.7±4.8 mmol/l,
HbA1c	7.1±1.8 percent,
Systolic blood pressure	137.8±21.7 mmHg
Diastolic blood pressure	82.9±11.9 mmHg
Triglycerides	182.9±97.2 mg/dl
Serum creatinine	1.9±0.9 mg/dl
LDL	105.7±34.3 mg/dl,
Total cholesterol	193.1±31.6 mg/dl

Table-3: shows diabetic retinopathy of the study patients, where majority (60%) patients was found NPDR, 10 % was PDR and 30% had no diabetic retinopathy.

Table 3: Diabetic retinopathy of the study patients.

Diabetic retinopathy	Percentage (%)
No DR	30%
PDR	05%
NPDR	65%

Table-4: shows association between diabetic retinopathy with diabetic nephropathy. 75% patients were observed having diabetic retinopathy with diabetic nephropathy and 25% patients had retinopathy but no nephropathy. Difference was statistically significant ($p<0.05$) between two groups.

Table 4: Association between diabetic retinopathy with diabetic nephropathy in 1 years.

Diabetic nephropathy	Diabetic retinopathy	P value
	Yes	
Yes	**75%**	**0.001**
No	**25%**	

DISCUSSION

This study showed 60% of the patients were male and 40% were female. The mean age was found 52±10.9 years with range from 25 to75 years. Similar observation was found in one study where they observed the mean age was found 57.09±11.47 years and 56% were male.[7]

Another study also found the mean age was 58.8±10.7 years.[8]

Other study reported that the mean age was found 47.16±11.05 years with range from 23 to 59 years.

Approximately half (52.7%) of the patients were female and 47.3% were male.[9]

In this study observed that the majority (60%) patients was found NPDR, 10 % was PDR and 30%was no DR in diabetic retinopathy. Which was supported by other study where percentage of NPDR and PDR were 28.5% and 1.5%.7 Epidemiologic study observed in Spain, which reported that the prevalence of DR, micro albuminuria, and overt nephropathy to be 26.11%, 17.78%, and 6.74%, respectively, in type 2 DM.[10]

Another study reported among 54 Diabetic Retinopathy patients, 12(22.3%) had Mild NPDR; 16(29.6%) had Moderate NPDR; 16(29.6%) had Severe NPDR; 10(18.5%) had PDR.[11]

In present study showed the majority (75.0%) patients had diabetic nephropathy and (25.0%) had no diabetic nephropathy.

Study reported diabetic nephropathy was found in 102 patients and 114 had no diabetic nephropathy.[12]

Whereas other study observed out of 54 Diabetic Nephropathy patients, 18(33.4%) had No DR; 8(14.8%) had Moderate NPDR; 8(14.8%) had Severe NPDR; 20(37%) had PDR.[13]

While observing clinical status where, mean BMI was found 27.0±3.0 (kg/m^2), FBS was 7.9±2.8 mmol/l, 2Hours ABF was 12.7±4.8 mmol/l, HbA1c was 7.1±1.8 percent, systolic blood pressure was 137.8±21.7 mmHg, diastolic blood pressure was found 82.9±11.9, triglycerides was 180.9±97.2 mg/dl, total cholesterol was 193.1±31.6 mg/dl, LDL was 105.7±34.3 mg/dl, serum creatinine was 1.9±0.9 mg/dl.

Where as one study reported similar type of results where FBS was 144.8±43.6 mg/dl, HbA1c was 7.56±1.50 percent, systolic blood pressure was 132.7±17.8 mmHg, diastolic blood pressure was 76.3±13.2, triglycerides was 180.3±127.9 mg/dl, total cholesterol was 186.3±37.8 mg/dl, LDL was 105.2±33.9 mg/dl, eGFR was 83.36±22.70 ml/min/1.73m2 and serum creatinine was 0.93±0.45 mg/dl.[13]

75% patients were observed diabetic retinopathy with diabetic nephropathy. Difference was statistically significant ($p<0.05$) between two groups.

One study found that, the frequency of nephropathy among individuals with retinopathy was 35.6%. The regression model analysis showed significant association between nephropathy and development of retinopathy.[14]

A number of studies provide evidence that DR may be independently associated with the development of micro albuminuria and hence be a powerful predictor for the progression of renal damage in DM patients.[12–15]

CONCLUSION

Diabetic retinopathy has a significant association with the occurrence of Diabetic nephropathy in patients with Type II DM in probable duration of 15 to 20 years.

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