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Original Article

Diabetic Retinopathy in Type 2 Diabetics

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Abstract

Background: To determine the frequency of diabetic retinopathy (DR) and its association with age, gender, duration of illness and type of anti diabetic treatment in type 2 diabetic patients.

Methods: In this cross sectional study 225 type 2 diabetes mellitus patients underwent detailed fundus examination for presence or absence of DR. If DR was noted, it was classified into background retinopathy, pre-proliferative retinopathy, proliferative retinopathy, and maculopathy. Comparison of patients with and without DR was done in terms of mean age, gender, duration of diabetes mellitus, and predominant mode of treatment (insulin or oral hypoglycemic agents) employing t test or Chi² test wherever appropriate. Duration of diabetic illness and type of DR were also correlated similarly.

Results: Mean patient age was 57.52±9.77 years. Diabetic retinopathy was seen in 52.4%. Majority (74.7%) were on oral hypoglycemics and 25.3% were on insulin. In 29.3% patients duration of diabetic illness was 5-10 years, while in the rest it was >10 years. Non-proliferative retinopathy was seen in 37.3%, 31.4% had pre-proliferative retinopathy, 10.2% had proliferative retinopathy and 21.2% had maculopathy. Longer duration of diabetes had statistically significant association with presence of DR and type of DR (p <0.05). Insulin therapy also correlated with presence of DR (p <0.05).

Conclusion: Frequency of DR in our type 2 DM patients was 52.4%. Duration of diabetic illness, and insulin therapy correlate with presence of DR.

Key Words: Diabetes Mellitus, Retinopathy.

Introduction

Diabetes mellitus (DM) is important health care problem in Pakistan. We are ranked in top ten countries with highest burden of DM. According to an estimate, total number of Pakistani diabetic patients in the year 2007 were 6.9 million, and this figure will cross 10 million limit in the year 2025.[1] About 10% of Pakistani population more than 30 years old suffers from type 2 DM.[2,3]

DM has many microvascular and macrovascular complications.[4] Microvascular complications are directly related to duration of DM. Diabetic retinopathy (DR) is a specific microvascular complication of DM. It is classified into; non-proliferative (background) retinopathy, pre-proliferative retinopathy, proliferative retinopathy, and maculopathy. DR is a potentially blinding complication, it is noted in 10-50% patients with type II DM.[1,5]

Patients and Methods

This cross sectional study was carried out at Department of Medicine, Holy Family Hospital, Rawalpindi. Type 2 DM patients (n=225) of either gender were inducted . Patients were more than 40 years of age, taking treatment in the form of insulin, oral hypoglycemic agents (OHA) or both. Patients with diseases associated with retinopathy like hypertension, anemia, vasculitis, myeloproliferative disorders and hematological malignancies were excluded.

Each patient underwent standard opthalmoscopic procedure for diagnosis of DR by employing Riester Pen-Scope Ophthalmoscope. If DR was noted, it was classified into background retinopathy, pre-proliferative retinopathy, proliferative retinopathy, and maculopathy.[6] Statistically significant association between mean values was noted employing t-test, and for categorical variables by Chi² test.

Results

Of the 225 type 2 DM patients, 109 (48.4%) were male and 116 (51.6%) female. Mean patient age was 57.52±9.77 years. Mean age of male patients was 58.22±10.95 and female patients was 56.85±8.51 years. 88 (39.1%) patients were diabetic for < 5 years, 66 (29.3%) for 5-10 years, 47 (20.9%) for 10-15 years, 18 (8%) for 15-20 years, and 6 (2.7%) for >20 years. Majority (74.7%) patients were on oral hypoglycemic agents and 57 (25.3%) on insulin (Table 1). Diabetic

retinopathy was detected in 118(52.4%) patients.Of the patients with DR, 44 (37.3%) had non-proliferative retinopathy, 37 (31.4%) had pre-proliferative retinopathy, 12 (10.2%) had proliferative retinopathy, and 25 (21.2%) had maculopathy (Table 2).

Table 1. Correlations of presence or absence of diabetic retinopathy (DR).

	DR Present	DR Absent	P value
Mean age			
	58.44±8.34	56.44±11.01	0.135
Gender (n and %)			
Male	59 (26.22%)	50 (22.22%)	0.624
Female	59 (26.22%)	57 (25.33%)	
Duration of diabetes in years (n and %)			
<5	26 (11.55%)	62 (27.55%)	0.00
5-10	40 (17.77%)	26 (11.55%)	
10-15	31 (13.77%)	16 (7.11%)	
15-20	15 (6.66%)	3 (1.33%)	
>20	6 (2.66%)	0 (0%)	
Predominant treatment (n and %)			
Oral hypoglycemics	81(36%)	87 (38.66%)	0.029
Insulin	37 (16.44%)	20 (8.88%)	

Table 2. Correlation of type of DR and duration of DM

Duration of diabetes	Type of retinopathy No(%)				P value
	Non Proliferative	Pre-proliferative	Proliferative	Maculopathy	
< 5 years	17 (7.55%)	1 (0.44%)	0 (0%)	8 (3.55%)	0.001
5-10 years	13 (5.77%)	12 (5.33%)	3 (1.33%)	12 (5.33%)	
10-15 years	8 (3.55%)	13 (5.77%)	6 (2.66%)	4 (1.77%)	
15-20 years	4 (1.77%)	7 (3.11%)	3 (1.33%)	1 (0.44%)	
> 20 years	2 (0.88%)	4 (1.77%)	0 (0%)	0 (0%)	

Discussion

Diabetic retinopathy is important long term diabetic complication. Depending on the duration of diabetic illness 100% of type I, and 75% of type 2 diabetics develop DR.[1] DR causes visual impairment in 86% type 1 and 33% type 2 DM patients.[1]DR was noted in 52.4% of our patients. Figures regarding presence of DR have been variable in various studies. Nathan reported 12.6% prevalence of retinopathy in recent onset diabetes in diabetes prevention programme.[7] Tahir et al from Pakistan reported 9%, Abdollahi et al from Iran 13.8%, Agarwal et al reported 11.7%, and Klein et al reported 10.2% prevalence of DR in newly discovered type 2 DM patients.[8-12] In another study conducted by Shafiqur Rahman and colleague DR was noted in 55% of DM patients.[4] Up to 30% frequency of DM has been noted in other Pakistani studies.[1] Our results are closer to the study conducted by Shafiqur Rahman and colleague, as it was also a hospital based study and included known DM patients rather than newly diagnosed DM patients which were included in other studies. Non-proliferative retinopathy (37.4%) was the type most frequently noted in our patients. It is the most frequently noted DR in studies conducted in Pakistan and other Asian countries.[1] Patient with longer duration of diabetes generally have advanced disease.[12]

Duration of DM and presence of DR had significant association in our patients. Among people who have type 2 DM, around 21% have retinopathy at time of diagnosis, and more than 60% have diabetic retinopathy during the first 20 years of the disease.[13,14] Results relating with our study were noted in Chennai Urban Rural Epidemiology Study (CURES) eye study, where prevalence of DR in all DM patients was 20.8% and in newly diagnosed diabetics 5.1%.[12]

Type 2 DM patients are usually put on insulin when optimal glycemic control is not achieved with combination of life style modifications and OHA. Prior poor glycemic control and various effects of insulin like increased propensity to develop atherosclerosis and thrombosis are considered contributory to it. [15,16]

Conclusion

Advanced diabetic retinopathy was noted in patients with longer duration of DM.

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