Frequency and Types of Diabetic Retinopathy in Type II Diabetes; A Hospital Base Study

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ABSTRACT

OBJECTIVES: To determine the frequency and type of diabetic retinopathy in different age groups.

STUDY DESIGN: Descriptive Case series study.

PLACE AND DURATION OF STUDY: Department of Ophthalmology Liaquat University of Medical and Health Sciences (LUMHS) Hyderabad, from February 2009 to January 2010.

METHODS: Two hundred and forty four patients of diabetes mellitus (DM) were randomly selected and grouped out into 30-40 years, 41-50 years, 51-60 years, 61-70 years and more than 70 years of age. Each patient was evaluated for diabetic retinopathy (DR) by fundoscopy and Fundus Fluorescence Angiography (FFA). The retinopathy was graded as 0-3 grade; grade 0= no DR, grade 1= mild DR, grade 2= moderate to severe DR and grade 3= proliferative DR. The different risk factors (age, gender, duration of DM, treatment type and hypertension) were evaluated in relation to diabetic retinopathy.

RESULT: Among 244 patients, 149 were males and 95 were females. Diabetic retinopathy was detected in 100 (40.94%) patients. Mean duration of DM was 13 years in patients with DR and 7.5 years in patients without DR. Most of the DR was found in 40-60 years of age. Out of 244 subjects 25% patients were found with grade 1, 6.96% patients with grade 2 and 9.01% patients were found with grade 3 diabetic retinopathy.

CONCLUSION: Most of the diabetic retinopathy cases were below the age of 60-years, and majority of DR cases presented with type 1 diabetic retinopathy.

KEY WORDS: Diabetic retinopathy, Diabetes Mellitus, Frequency.

INTRODUCTION

In the century 21st with marked improvement in the quality of health care in the various institutes of the under developed countries, the diabetes mellitus has emerged as one of the major health problem worldwide.

Pakistan stands at seven number and by the year 2025 it will be at fifth position in the list of highest diabetic populated country as estimated by International Diabetic Federation (IDF) Database on Diabetics [1]. The National Blindness Survey carried out in Pakistan during year 2002-2004 estimated 1.5 million blind peoples and out of these approximately 0.5% became blind due to diabetic complications like diabetic retinopathy (DR) [2].

Diabetic retinopathy is the most common and devastating microvascular complication of diabetes, which is producing severe visual loss[3], and global data also supports this assumption that in the future the diabetic retinopathy will be the leading cause of blindness [4, 5]. The ratio of blindness in type 1 diabetes is 4% and in type 2 it is 1.6%[6]. Previous surveys conducted in Pakistan showed that more than 10% of adult population had type 2 diabetes[6].

The prevalence of diabetes is reaching epidemic proportion but its frequency varies in different ethnic group[7]. The factors that influence the prevalence of DR include duration of diabetes[8], types of treatment[9], hyperglycemia[10], hypertension[11], proteinuria[12], serum cholesterol and triglyceride.[13]

The object of this study was to determine the frequency of diabetic retinopathy in type 2 Diabetes mellitus in population of catchment area of LUMHS eye hospital and also to evaluate the status of retinopathy in the study group. This study may help to enhance the awareness of this serious complication of diabetes and to guide the population for early intervention to prevent the further detoriation of vision.

SUBJECTS & METHODS

This descriptive case series study was conducted in the department of Ophthalmology of Liaquat University of Medical and Health Sciences (LUMHS) Hyderabad from February 2009 to January 2010.

Patients of either sex with age of 30 years and above were selected for this study by conventional randomization method. The diagnostic criteria for diabetes mellitus (DM) was set as defined by World Health Or-

ganization (WHO) [14]. Replacement was made for any dropout case attributing to difficulty in grading the retinopathy as a result of concomitant corneal or lenticular opacities, and retinopathy in non-diabetics.

After obtaining the informed consent, information regarding demographics and complete medical history was recorded in a pre-designed proforma including history of treatment regimen, age at onset of diabetes, duration of diabetes and history of hypertension.

A random serum glucose level of each patient was calibrated by single touch gluco- meter to diagnose diabetic control. Seated blood pressure of each patient was measured in the right arm, with mercury sphygmomanometer.

At least two readings of systolic blood pressure (SBP) and diastolic blood pressure (DBP) were taken and mean of two readings was recorded. SBP > 140 mm Hg or DBP > 90 mm Hg was diagnosed as hypertension.

Then pupil of each patient was dilated with 1% tropicamide and 10% phenylephrine to examine the fundus detail, using 90 D with the help of slit lamp binocular microscope. After this fundus fluorescence angiography (FFA) was performed as needed, then grading of severity of diabetic retinopathy was made out as defined by the Early Treatment Diabetic Retinopathy Study (ETDRS) [15].

Mean and rage was calculated for quantitative variables such as age and duration of DM; whereas frequency and percentage were calculated for qualitative variables like gender, types of DR. SPSS 11.0 was used for calculations.

RESULTS

Among 244 subjects 149 were males and 95 were females with mean age of 45±11.5 years. Diabetic retinopathy was present in 100 (49.94%) patients. Duration of DM, type of treatment, gender distribution and presence of hypertension are evaluated in **Table I**. Out of 244 diabetics, 144 did not present DR (grade 0); while among rest of 100 subjects 61 (25.0%) pre-

sented with grade 1 DR, 17 (6.96%) presented with grade 2 DR and 22 (9.0%) presented with grade 3 DR, as detailed in **Table II**.

TABLE I: RISK FACTORS FOR DR (n=244)

Variables	DR (+ve) n=100	DR (-ve) n=144
Duration of DM (Years) • Range • Mean	5-20 13±4.5	3-16 7±3.8
Treatment Regimen • Insulin • Oral	16 16.0%) 84 (84.0%)	44 (30.55%) 100 (69.44%)
Gander (n, %) • Male • Female	51 (51.0%) 49 (49.0%)	44 (30.55%) 100 (69.44%)
Hypertension	19 (19.0%)	50 (34.72%)

DISCUSSION

In this study DR was present in 40.64% that is approximate to those found in the study from Egypt, that reported the frequency of DR 42.0% and a study from Oman that reported the 42.4% of DR[9,16.] A previous local study in Pakistan has reported the approximate figure 43.0 % of DR[17]. But recently a local study reported 27.43% of DR in the diabetes cases[18]. Some studies reported 23.7%, 16.5% and 30.0% DR in India, UK and Spain respectively[19-21.]

The most common type of DR in this study was Grade I which was prevalent in 25.0% of the diabetic patients. These findings are similar to the results of other Asia-based studies[8,22-25] but the result of grade 2 and 3 of DR showed dissimilar number which contradicted with most of the reports[13, 17].

The disparity in our results with recent studies may be due to lack of awareness in our patients to undertake

TABLE II: FREQUENCY AND TYPE OF DR IN DIFFERENT AGE GROUP (n=244)

Age	Grade 0 n (%)	Grade 1 n (%)	Grade 2 n (%)	Grade 3 n (%)	DR +ve n (%)
30-40 year	39 (15.98)	19 (07.78)	03 (01.22)	02 (00.81)	24 (09.83)
41-50 year	15 (06.14)	16 (06.55)	07 (02.86)	03 (01.22)	23 (09.42)
51-60 year	26 (10.65)	16 (06.55)	04 (01.63)	05 (02.04)	25 (10.24)
61-70 year	42 (17.21)	05 (02.04)	03 (01.22)	05 (02.04)	16 (06.55)
71+ year	22 (13.11)	05 (02.04)	00 (00.00)	07 (02.86)	12 (04.91)
Total	144 (59.01)	61 (25.0)	17(06.96)	22 (09.01)	100 (40.94)

regular eye examination or due to the selection bias as only those patients who were already known diabetics having longer duration and who presented with some clinical relevant problems were included in present study.

In our study most of the DR was found between 40-60 years of age. The prevalence of DR in the UAE was 19% and significantly affected elderly males[26]. In a population-based study of retinopathy from Victoria (the Melbourne Visual Impairment Project [Melbourne VIP]), the frequency of retinopathy was 29.1% in those with self-reported diabetes (age ≥40 years, types 1 and 2 diabetes)[27]. In the Blue Mountains Eye Study the frequency of retinopathy was 35.5% based on self-reported diabetes (age ≥49 years, types 1 and 2 diabetes)[28]. In present study known diabetics of age ≥30 years presenting in clinical setting were included among which 40.94% presented with diabetic retinopathy. This difference of age and setting seems to be the reason for difference in results of these studies and the present study.

Duration of diabetes mellitus is directly proportional to the frequency of diabetic retinopathy as proved by Haddad et al[8] and Mekay et al[27]. Mitchell et al[29] reported that about 8% of patients become DR for each year that duration of diabetes increased, it mean as the patient aged with the extension of duration of diabetes, the frequency of DR stepped up and is an independent risk factor for DR.

It was also found in this study that hypertension has no relation to DR, while earlier reports were inconclusive regarding that association between systemic hypertension and DR[30,] later specific studies found no relation between hypertension and diabetic retinopathy[10.]

CONCLUSION

In the present study most of the diabetic retinopathy cases were below the age of 60-years and majority of DR cases presented with type 1 diabetic retinopathy.

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