Original Article

Prevalence of Diabetic Retinopathy in Patients of Age Group 30 Years and Above Attending Multicentre Diabetic Clinics in Karachi

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Purpose: To estimate the frequency of diabetic retinopathy by age, sex and type of diabetes (Type I & Type II) and to identify possible risk factors for diabetic retinopathy.

Material and Method: It's a descriptive cross – sectional study. During the study 525 diabetic subjects of age 30 years and above were screened at Al-Ibrahim Eye Hospital (AIEH), Diabetic association of Pakistan (DAP), and two primary eye care centres community based diabetic clinics(Gadaap Town and Jamshed Town).

Results: Overall mean age of the subjects was 55.3 (± 8.9) years with male: female 1: 1.3. The diabetic retinopathy of any grade was detected 28.8% (151 subjects out of 525). Out of them non-proliferative diabetic retinopathy (Mild to severe) was 33.1%, proliferative diabetic retinopathy was 2.65%, clinically significant macular oedema + Non proliferative diabetic retinopathy was 50.33%, clinically significant macular oedema + proliferative diabetic retinopathy was 4.64% and advanced diabetic retinopathy was 9.28%. 85 (56.29%) diabetic patients had uncontrolled diabetes among all retinopathies.

Conclusion: Diabetes mellitus and diabetic retinopathy is becoming a major threat to eye health in our community. People with diabetes mellitus should be encouraged to maintain good glycemic control and undergo regular fundus screening (examination) to delay or prevent the development of diabetic retinopathy.

Diabetes is a major public health problem in the world. There is no available curative treatment for this costly disease. It is costly in terms of loss of quality of life[1], loss of life[2], economic burden on the community and on the family of the diabetic patient and on the health sector[3].

According to Pakistan national diabetes survey[4], Pakistan ranks 8th highest worldwide in the prevalence of diabetes. A diabetic can have a serious eye disease and not even know about it until irreversible vision loss has occurred[5,6]. It has been estimated that 6.2 million people in Pakistan have diabetes, representing 8.5% of the total adult population. This is expected to rise to 11.6 million by 2025[7]. In Pakistan, only 33% to 44% of known diabetic patients have correct knowledge of diabetes and its complications[8].

The main aim of the study is to find out the frequency of the diabetic retinopathy among patients with diabetes along with the identification of possible risk factors.

MATERIAL AND METHODS

The study was a descriptive cross-sectional study, conducted between February to April 2010.

Diabetic patients of both gender, aged 30 years and above were included in the study.

Critically ill patients, those with opaque media or subjects having bilateral phthysical eye or an empty socket were excluded from the study.

As a first step patients were screened at the diabetic clinics of primary eye care centres located at Gadaap town and Jamshed town, then at the hospital based diabetic clinics for assessment of diabetic subjects for diabetic retinopathy.

Written permissions were taken from the head of Ai-Ibrahim Eye Hospital and Diabetic Association of Pakistan for conducting the study and informed individual consent was taken from all diabetic patients at the examination site.

Snellen visual acuity, as recorded by an ophthalmic technician and demographic data and blood sugar, information about occupation, duration of diabetes, pregnancy, smoking and hypertension were also recorded. Patients were examined on slit lamp for anterior and posterior segment examination by an ophthalmologist. All the patients (except Diabetic Association of Pakistan) were dilated with Tropicamide1% eye drops and examined with indirect ophthalmoscope. At Diabetic Association of Pakistan, fundus photographs were taken with non-mydriatic fundus camera.

During this stage the questionnaire file was created in computer by using Epi-info 6 version program. Data was entered and analysed by using same version in the computer. Descriptive statistics of the diabetes was analyzed, age was recorded as mean and standard deviation, male to female gender ratio was recorded. Frequency of diabetic retinopathy was calculated and relative frequency of different presentation of diabetic retinopathy was calculated.

RESULTS

We screened a total of 525 consecutive diabetic patients in four diabetic clinics from February to April 2010. The male to female distribution were 229(43.62%) and 296(56.38%) respectively (m: f = 1: 1.3) (Table 1). Of them, 151 (28.76%) had diabetic retinopathy, 2 (1.32%) had type I diabetes and 149 (98.68%) had type II diabetes (Table 2). Out of 151 diabetic patients sex distribution of diabetic retinopathy was approximately same among male 76 (50%) as compared with female 75 (49.66%). Highest distribution 56/151 (37%) of diabetic retinopathy belonged to the age group 50-59 years, 28.48% in age group 60-69 years, 21.85% in age group 40-49 years, 6.62% in age group ≥ 70 years and in the age group 30-39 years was 5.96% and this whole percentage belonged to type II diabetes. (Table 3) Proportion of known diabetic (Type II Diabetes Mellitus) was 149/ 151 (98.68%).

Table 1: Type of diabetes mellitus and sex distribution among total subjects N= 525

Type of diabetes mellitus	**No. of Patients n (%)**
Type I	04 (0.76)
Type II	521 (99.24)
Sex	
Male	229 (43.62)
Female	296 (56.38)
Total	525 (100)

Table 2: Diabetic Retinopathy by Sex and by Type of Diabetes Mellitus n=151

	Male	**Female**	**Total n (%)**
Type I	02	00	02 (1.32)
Type II	74	75	149 (98.68)
DR	76	75	151 (100)

Table 4: Clinical presentation of diabetic retinopathy n=151

Types of diabetic retinopathy	**No. of patients n (%)**
Mild NPDR	21 (13.90)
ModerateNPDR	28 (18.54)
Severe NPDR	01 (0.66)
PDR	04 (2.65)
CSME+NPDR	76 ()50.33
CSME+PDR	07 (4.64)
Advanced Diabetic Retinopathy	14 (9.28)
Total	151 (100)

The commonest presentation of diabetic retinopathy was clinically significant macular oedema + Non proliferative diabetic retinopathy 50.33%, Non proliferative diabetic retinopathy (33.1% [mild: 13.90%, moderate: 18.54%, and sever Non proliferative diabetic retinopathy: 0.66%]), followed by, Advanced diabetic retinopathy (9.28%) clinically significant macular oedema + proliferative diabetic retinopathy (4.64%), and proliferative diabetic retinopathy (2.65%). (Table 4).

Among 151 subjects with diabetic retinopathy 47% were house wives, 14.6% were self employed, 9.3% were Government employees, 3.3% were labourers and 0.6% were farmers.

DISCUSSION

Diabetes is a major public health problem in the world. It has emerged as one of the major health problems in Pakistan[9]. There is no available curative

Table 3: Diabetic Retinopathy by age group and type of Diabetes Mellitus N=525

Age group	Total Diabetic Patients	Type I Diabetes	Type II Diabetes	Diabetic Retinopathy Percentage
30-39	41	02	39	09 (5.96)
40-49	130	02	128	33 (21.85)
50-59	195	00	195	56 (37.09)
60-69	134	00	134	43 (28.48)
≥ 70 years	25	00	25	10 (6.62)
Total	525	04	521	151 (100)

Table 5: Diabetic Retinopathy by duration of Diabetes Mellitus N=525

Duration of Diabetes Mellitus	Total Diabetic Patients	Total with Diabetic Retinopathy n (%)
< 5 years	232	32 (21.2)
5-10 years	141	41 (27.15)
11-15 years	83	41 (27.15)
16 years & on wards	69	37 (24.50)
Total	525	151(100)

Table 6: The distribution of diabetic retinopathy in female & male diabetic patients.

	No Dr	NPDR	CSME+NPDR	CSME+PDR	PDR	ADV.DR
Female	3.6	2.5	3.4	0.6	0.5	0.4
Male	2.5	2.6	2.9	0.7	0.5	2

CSME=clinically significant macular oedema
NPDR=Non proliferative diabetic retinopathy
PDR=Proliferative diabetic retinopathy
ADV. DR= Advanced diabetic retinopathy

treatment for this costly disease. With the advent of anti-diabetic drugs, the average life of diabetic patients has increased, but at the same time the incidence of diabetic retinopathy has unfortunately increased many folds[10]. Diabetes is the principal culprit for development of diabetic retinopathy. Diabetes mellitus affects nearly all tissues of the eye. Although some effects are mild or temporary with little visual disability, a significant loss of vision can occur when patients develop more serious ocular complications such as diabetic retinopathy and macular oedema[11]. King[12] estimates a high prevalence of diabetes by 2025. This is a matter of great concern considering the potential for blindness due to diabetic retinopathy.

Table 7: The Distribution of DR in Diabetic Patients

Types of diabetic retinopathy	No. of patients n (%)
ADV.DR	14 (2.67)
PDR	4 (0.76)
CSME+PDR	7 (1.34)
CSME+NPDR	76 (14.47)
NPDR	50 (9.52)
NO DR	374 (71.24)

CSME=clinically significant macular oedema
NPDR=Non proliferative diabetic retinopathy
PDR=Proliferative diabetic retinopathy
ADV. DR= Advanced diabetic retinopathy

According to a WHO survey the prevalence of diabetes in 1995 Pakistan was at number 8 in the world and if interventional strategies are not adopted and implemented Pakistan will be ranked at number 4 in the year 2025 having 14.5 million people with diabetes[13]. When compared to other population and center based studies conducted in different parts of the world, including Tunisian, Omanis, migrant Indian, Chinese Mauritians, Italian,[14] Asian Indian,[15] and south Asian[16] the prevalence ranges between 10%-50%.

The non insulin dependent diabetes mellitus in Pakistan occurs at a relatively younger age, as compared to the western world where it occurs above the age of 40[17]. In current study this high frequency of diabetes mellitus might have resulted due to the fact that focus was given to younger age group (30 years and above). Results of present study show that 27.81% of diabetic retinopathy belongs to working age group (between the age group 30-49 years).Results show that most of them had uncontrolled diabetes. If they live longer (as life expectancy has increased up to 64 years for males and 63 years for females), we can well imagine how much proportion of diabetic subjects will have a chance to develop DR in future.

During this study 525 diabetic patients were screened for diabetic retinopathy followed by estimating the frequency of DR in screened diabetic patients. Out of total 525 diabetic patients 151 had diabetic retinopathy. It was estimated that total prevalence of DR was (28.76%). 1.32% were IDDM, 98.68% were NIDDM. In present study the frequency of IDDM was low, similarly it was reported that IDDM (Type I) diabetes continues to be a rare disorder in Pakistan[17]. Findings of a survey by the Diabetic Association of Pakistan (DAP) said that Insulin-Dependent Diabetes Mellitus (IDDM) type I, constitutes less than two percent of total diabetic population while the other 98 per cent are Non Insulin-Dependent Diabetes (NIDDM) or Type II.

A diabetic patient is 25 times more likely to become blind than non-diabetic[18]. And indeed diabetic retinopathy is the most common cause of blindness in the working age group[19]. Diabetic retinopathy is one of the few ophthalmic diseases where there is a well developed role of preventive measure to delay progression of the disease and consequent visual loss[20]. Population based assessment of a disease assists in assessing its magnitude in the population and in estimating the need for services for that disease. In our study, the frequency of DR among diabetics was 28.76% which is lower than that (51-60 %) reported in other studies conducted in Karachi and other cities in Pakistan[21]. The reason behind these differences could be that all the other studies were purely hospital based and were not conducted under similar circumstances. Because of the small sample size and non-representative nature of the sample, the observed frequency of our study cannot be generalized to the general population. The people who were screened for diabetic retinopathy were those who had diabetes and/or diabetic retinopathy thus causing an over representation of diabetic retinopathy. When compared with other clinical and population based studies of the world including United Kingdom,[22] United State of America,[23] Spain,[24] Senegal,[25] China,[26]

shows the great fluctuations in the prevalence of diabetic retinopathy, and the results vary between 1.78% - 64.5%. The reason for such a large variation in the prevalence of diabetic retinopathy may be due to the fact that these studies were not performed under the similar condition and result varies in different ethnic groups[27]. Lack of uniformity in study designs, protocols for examination and documentation may explain some of these differences**.**

The most prevalent type of DR in our study was clinically significant macular edema +Non proliferative diabetic retinopathy which accounted for 50.33% of the cases. Non proliferative diabetic retinopathy accounted for 79.1% of the cases compared with 92%, 89.3 to 94.1% and 69.8% in studies conducted in Australia, India and Oman, respectively[27].

We found a low frequency of proliferative diabetic retinopathy out of all retinopathies (2.65%). Similarly lower results of proliferative diabetic retinopathy also reported in hospital and community based studies in Pakistan and elsewhere[28].

CONCLUSION

Frequency of clinically significant macular edema in combination with Non proliferative diabetic retinopathy is much higher followed by Non proliferative diabetic retinopathy and advanced diabetic eye disease in the community. Most patients of diabetic retinopathy belonged to middle age group (40 – 60 years). There was a lack of tendency among the patients to acquire treatment of Diabetes mellitus.

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