



Original Article

Diabetic Retinopathy in Patients Presenting to the Screening Clinic of A Tertiary Care Hospital in Pakistan.

A uthor's Affiliation

Mohammad Ali A Sadiq

Munib Ur Rehman

Asad Aslam Khan

Tehseen Mahju

Arif Hussain

Mudassar Fatima

Amna Islam

Correspondence Author:

Correspondence to:

Dr. Mohammad Ali A Sadiq

Asstt Prof Eye Unit III

Institute of Ophthalmology,

Mayo Hospital, Lahore

Lahore. Pakistan

E-mail: Sadiq.maa@gmail.com

Purpose: The purpose of this study is to assess the state of diabetic retinopathy in patients presenting at a tertiary care hospital in Pakistan.

Methods: Clinical notes of 9854 patients diagnosed with Diabetes, presenting in the Outpatient department of Mayo Hospital Lahore from 2009 to 2014 and who were screened for diabetic eye disease, were reviewed. Fundus examination was carried out using fundus camera to detect signs and grade of diabetic retinopathy.

Results: Out of patients with Insulin Dependent Diabetes Mellitus (IDDM) 5893(85.0%) patients had normal fundi while findings consistent with Non proliferative Diabetic Retinopathy (NPDR), Proliferative diabetic retinopathy (PDR) and Advanced Diabetic Eye Disease (ADED) were seen in 723 (10.4%), 39 (0.6%) and 279 (2.6%) eyes, respectively. While in case of patients with Non- Insulin Dependent Diabetes Mellitus (NIDDM) 9869 (77.3%), had no abnormality in their fundi, while NPDR, PDR and ADED was seen in 1823 (14.3%), 60 (0.47%) and 1022 (8%) eyes, respectively. Overall out of a total of 19708 eyes, 15762 (79.9%) had no signs of diabetic retinopathy, 2546 (12.9%) had NPDR, 99 (0.50%) had PDR and 1201 (6%) eyes had ADED.

Conclusion: The results of our study substantiate the findings of previous researches carried out in Pakistan

Key words: Diabetic retinopathy, Pakistan, Prevalence.

Introduction:

With the concurrent industrial development, altered lifestyle, and prolonged life span, diabetes and its related blindness are reaching alarming proportions.¹ According to World Health Organization (WHO), about 347 million people across the globe suffer from diabetes.²

Diabetic retinopathy (DR) is the fifth leading cause of global blindness, affecting an estimated 1.8 billion people, and is responsible for 4.8% of blindness.

The diabetic clinic in Mayo Hospital Lahore works in liaison with various government hospitals of Lahore to screen out all patients recently diagnosed with diabetes, for diabetic retinopathy. We undertook this study to assess the state of diabetic retinopathy in patients who presented to the screening clinic, giving us an assessment of the burden of the disease, and thus help us planning further the direction of action to prevent sight threatening complications of this disease.

Methods:

A retrospective review of the medical records of patients presenting to the Diabetic Eye clinic, Institute of Ophthalmology, King Edward Medical University Lahore for screening of Diabetic Retinopathy between January 2009 and December 2014 was performed after Institutional Review Board approval.

Any patient having current ocular inflammation or infection at the time of presentation was excluded. Patient information like gender, occupation, type of diabetes, known duration of diabetes, and grading of Diabetic retinopathy in each eye, including the presence of Clinically significant Macular edema were collected. Depending on the severity of the disease, the patients were either called for an annual follow up in the Diabetic clinic or referred to the vitreo-retina clinic for further management.

The data collected were analyzed using SPSS 16. Qualitative variables like gender, type of diabetes, grading of Diabetic retinopathy and presence of clinically significant macular edema, has been presented as percentages.

Results:

5774 (58.6%) of the 9854 patients screened were females (Chart 1) and 4978 (50.5%) were house wives (chart 2). 6387 (64.87%) patients were diagnosed as having Type 2 (Non Insulin dependent) Diabetes (chart 3). 4971 (50.4%) patients were on insulin therapy for control of diabetes. 930 patients (9.4%) had duration of disease less than 1 year, 5763 (58.5%) between one to ten years, 2692 (27.3%) between eleven to twenty years whereas 469 patients (4.7%) had disease for more than twenty years.

Of 19708 eyes, 15762 (80.0%) showed no signs of

diabetic retinopathy. 2546 (12.9%) had non Proliferative Diabetic Retinopathy (NPDR). 99 (0.5%) eyes had developed Proliferative retinopathy (PDR) (chart 4). 1301 (6.6%) eyes had signs of advanced diabetic eye disease. 276 (1.4%) eyes had clinically significant macular edema.

5893 (85.0%) patients with Insulin Dependent Diabetes Mellitus had normal fundi while findings consistent with NPDR, PDR and ADED were seen in 723 (10.4%), 39 (0.6%) and 279 (4.0%) eyes respectively. In patients with NIDDM 9869 (77.3%), had no abnormality in their fundi, while NPDR, PDR and ADED was seen in 1823 (14.3%), 60 (0.5%) and 1022 (8%) eyes respectively. (graph 2) CSME was seen in 80 (1.2%) of IDDM patients and 196 (1.5%) in NIDDM patients.

Patient with duration of diabetes less than 10 years, 11411 (85.2%) eyes had no signs of diabetic retinopathy while 1212 (9%) had NPDR, 39 (0.3%) PDR and 724 (5.4%) had ADED. In patients with duration between 11-20 years, 3724 (69.3%) eyes had no signs of diabetic retinopathy while 1129 (21%) had NPDR, 45 (0.8%) PDR and 478 (8.9%) ADED. In patients with duration of greater than 20 years, 627 (66.3%) eyes had no signs of diabetic retinopathy while 205 (21.7%) had NPDR, 15 (1.6%) PDR and 99 (10.5%) ADED.

4.09% of patients with ADED fell in the category of known duration less than 1 year probably because of diabetes not being diagnosed for a long time due to the asymptomatic nature of it. The probability of finding increased to 10.47% for patients having known duration of diabetes between 11 to 20 years.

8372 (85%) patients were called for annual follow-up, 810 (8.2%) were referred to Vitreo-retina clinic for further evaluation and treatment plan. 230 (2.3%) patients were sent for Fundus Fluorescein Angiography. 250 (2.5%) patients were sent to laser clinic while 195 (2%) patients had surgical management.

Discussion:

Retinopathy is disabling and sight threatening complication of diabetes mellitus. It occurs due to microvascular abnormalities developing the circulatory system. Duration of diabetes, its type, control of blood sugar, associated systemic conditions, age and sex are found to be associated with retinopathy and its progression³.

DR includes signs due to vascular leakage (retinal edema, hemorrhages and exudates) and ischemia (Intra-retinal microvascular abnormalities, Cotton wool spots, and vascular changes) and their complications (vitreous hemorrhage and tractional retinal detachment). All these changes can result in defective vision that may be reversible (in early stages) or irreversible (in advanced stages).^{4,5} The changes in diabetic retinopathy progress over a period of

years, however most of the times they are silent and the patient presents only when there is maculopathy or some late complication.

A study done in Singapore by Wong et al⁶ revealed a presence of Diabetic retinopathy of 35.0%, whereas Ossama et al⁷ estimated the prevalence of DR in Omani population to be 44.2%, with NPDR and PDR reported to be 4% and 12.8% respectively. In two studies from Shanghai, the prevalence of NPDR and PDR was found to be 19.4-21.6% and 0.5-1.3%^{8,9}, whereas in Mauritius it was 38.7 and 4.5% respectively¹⁰. The Wisconsin Epidemiologic Study of DR presented the prevalence to be 35.5 and 2.9% for Caucasian population. Insulin resistance has been suggested to be the cause of difference in values between ethnic variants¹¹.

Due to low literacy rate in Pakistan, all visual degradation is considered to be due to opacification of the lens rather than anything else, further aggravated by the fallacy that eye should be operated upon only when there is almost total loss of vision, lead to delayed presentation of patients having diabetic retinopathy. The diagnosis of diabetes is also delayed in most of the patients, in spite of the fact that this disease has spread like an epidemic.

Furthermore, very little research work is available on the demographics of diabetic retinopathy in diabetic patients in Pakistan. The prevalence of DR reported in Pakistan population is 15-19.9% on average in literature. A study done by Kayani¹² and Khan¹³ et al suggested the prevalence of DR to be 26.1 & 33.3% respectively.

To the best of our knowledge this is the first large scale study from Pakistan done over a span of 4 years. Our study reports that Out of patients screened with IDDM 5893(85.0%) patients had normal fundi while findings consistent with NPDR, PDR and ADED were seen in 723 (10.4%), 39 (0.6%) and 279 (2.6%) eyes. While in case of patients with NIDDM 9869 (77.3%), had no abnormality in their fundi, while NPDR, PDR and ADED was seen in 1823 (14.3%), 60 (0.47%) and 1022 (8%) eyes. Overall out of a total of 19708 eyes, 15762 (79.9%) had no signs of diabetic retinopathy, 2546 (12.9%) had NPDR, 99 (0.50%) had PDR and 1201 (6%) eyes had ADED. Our findings substantiate the findings of previous researches carried out in Pakistan.

Financial Support: Funding was provided by The Fred Hollows Foundation Australia.

Conflict of Interest: No conflicting relationship exists for any author

References:

1. Wild S, Roglic G, Green A, Sicree R, King H, et al. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. *Diabetes care*. 2004;27(5):1047-53.
2. Danaei G, Finucane MM, Lu Y, Singh GM, Cowan MJ, Paciorek CJ et al. National, regional, and global trends in fasting plasma glucose and diabetes prevalence since 1980: systematic analysis of health examination surveys and epidemiological studies with 370 country-years and 2.7 million participants. *Lancet*. 2011;378(9785):31-40.
3. Raczynska D, Zorena K, Urban B, Zalewski D, Skorek A, Malukiewicz G, et al. Current trends in the monitoring and treatment of diabetic retinopathy in young adults. *Mediators of inflammation*. 2014;2014:492926.
4. Wang FH, Liang YB, Zhang F, Wang JJ, Wei WB, Tao QS, et al. Prevalence of diabetic retinopathy in rural China: the Handan Eye Study. *Ophthalmology*. 2009;116(3):461-7.
5. Cugati S, Mitchell P, Wang JJ. Do retinopathy signs in non-diabetic individuals predict the subsequent risk of diabetes? *The British journal of ophthalmology*. 2006;90(7):928-9.
6. Wong TY, Cheung N, Tay WT, Wang JJ, Aung T, Saw SM, et al. Prevalence and risk factors for diabetic retinopathy: the Singapore Malay Eye Study. *Ophthalmology*. 2008;115(11):1869-75.
7. El Haddad OA, Saad MK. Prevalence and risk factors for diabetic retinopathy among Omani diabetics. *The British journal of ophthalmology*. 1998;82(8):901-6.
8. Hu HY, Lu B, Zhang ZY, Mao LY, Song XY, Dong XH et al. An epidemiological study on diabetic retinopathy among type 2 diabetic patients in Shanghai. *Zhonghua liu xing bing xue za zhi* *Zhonghua liuxingbingxue zazhi*. 2007;28(9):838-40.
9. Zhang HX, Jia LL, Hou XH, Lu JX, Lu HJ, Du J, et al. Prevalence of and risk factors associated with diabetic retinopathy in pre-diabetic and diabetic population in Shanghai community. *Zhonghua yi xue za zhi*. 2009;89(25):1749-52.
10. Dowse GK, Humphrey AR, Collins VR, Plehwe W, Gareeboo H, Fareed D, et al. Prevalence and risk factors for diabetic retinopathy in the multiethnic population of Mauritius. *American journal of epidemiology*. 1998;147(5):448-57.
11. Haffner SM, Mitchell BD, Moss SE, Stern MP, Hazuda HP, Patterson J, et al. Is there an ethnic difference in the effect of risk factors for diabetic retinopathy? *Annals of epidemiology*. 1993;3(1):2-8.
12. Kayani H, Rehan N, Ullah N. Frequency of retinopathy among diabetics admitted in a teaching hospital of Lahore. *J Ayub Med Coll Abbotabad*. 2003;15:53-6.
13. Khan AJ. Prevalence of diabetic retinopathy in Pakistani subjects. A pilot study. *J Pak Med Assoc*. 1991;41:49-50.