Original Article

Frequency of Retinopathy in Newly Diagnosed Patients of Type 2 Diabetes Mellitus

Kashif Jamil, Yasir Iqbal, Sohail Zia, Qaim Ali Khan

Pak J Ophthalmol 2014, Vol. 30 No. 1

See end of article for authors affiliations

Correspondence to:
Kashif Jamil
Department of Medicine
Punjab Medical College
Unit IV DHQ Hospital
Faisalabad

Purpose: To find out the frequency of retinopathy in newly diagnosed patients of type 2 diabetes mellitus.

Material and Methods: After the approval of the hospital ethical committee and informed verbal consent of the patients the study was conducted in the out patients department of medicine, DHQ Hospital, Faisalabad. All patients of either sex (Non-probability consecutive sampling) were included, who were diagnosed within two months as type 2 diabetes mellitus. Diagnosis of Diabetes was done by reports of > 200 mg/dl on two consecutive base line random blood sugar (RBS), fasting blood sugar (FBS) and Glycosylated hemoglobin (HBA1c). All the patients underwent dilated retina examination with +90 Diopter lens on biomicroscopic slit lamp and diabetic retinopathy was labeled on the basis of presence of fundus findings.

Results: The study was completed in a period of 7 months from Sep 2010 to March 2011. A total of 196 patients fulfilling the criteria were included. Age range was 31 to 60 years with a mean age of 50.95 ± 10.12 years. Diabetic retinopathy was observed in 25 (12.75%) patients with newly diagnosed type 2 diabetes mellitus. The HbA1C (%) was found to be 9.5 ± 1.6 in the patients with diabetic retinopathy and 7.4 ± 2.5 in patients without diabetic retinopathy.

Conclusion: We found that the frequency of retinopathy in newly diagnosed patients of type 2 diabetes mellitus is 12.75% and we stress the value of in depth ophthalmic assessment of every patient of diabetes at the time of diagnosis.

Diabetes mellitus is a global epidemic. It is estimated that 171 million people are suffering from this disease throughout the world which is increasing in number every year. Diabetic retinopathy (DR) is one of its frequent and serious complications and is among the leading causes of blindness worldwide. A patient can be suffering from type 2 diabetes mellitus well before clinical diagnosis and usually has diabetic retinopathy at the time of his diagnosis.

Diabetic retinopathy (DR) is defined as damage to retinal microvascular system due to prolonged hyperglycemia. Major risk factors are duration of diabetes, degree of glycemic control and hyperlipidemia. In type 2 diabetic subjects diabetic retinopathy has been associated with increase in arterial stiffness and thickness of the intima-media suggesting that a common pathophysiology might be leading to diabetic microangiopathy[1].

Diabetics are 25 times more likely to become blind than non-diabetics due to diabetic retinopathy. For this it is vital to increase the awareness about the complications of diabetic retinopathy by educating the patients through the health care professionals and public seminars[3].

Over the past 20 years, eight population-based studies have suggested that the prevalence of diabetic retinopathy is close to 28.7% in diabetic patients[2]. A study conducted in Karachi among the newly

diagnosed cases of type 2 diabetes mellitus reported 15% of the patients had diabetic retinopathy[4]. We conducted a similar study to determine the frequency of retinopathy in newly diagnosed diabetic type 2 patients in order to see the magnitude of the problem in local population compared to the available statistics. By doing so one would be able to suggest more meticulous primary and secondary preventive strategies that would ultimately decrease the morbidity of such patients.

MATERIAL AND METHODS

After the approval of the hospital ethical committee and informed verbal consent of the patients the study was conducted in the medical out patients departments of DHQ Hospital, Faisalabad. The purpose of research was explained to the patients. All patients of either sex (Non-probability consecutive sampling) were included, who were diagnosed within two months as type 2 diabetes. Diagnosis of Diabetes was done by reports of > 200 mg/dl on two consecutive base line random blood sugar (RBS), fasting blood sugar (FBS) and Glycosylated hemoglobin (HBA1c) on the following set criteria as defined by world health organization (WHO) in 1999 and revised in 2006[5]. Patients having associated hypertension, renal disease, corneal opacity, mature cataract, hazy vitreous and or uncooperative due to any reason, were excluded from study. The pupil was dilated after instillation of one drop of tropicamide in each eye. All the patients underwent dilated retina examination with +90 Diopter lens on biomicroscopic slit lamp for the presence of diabetic retinopathy. The patients requiring further evaluation or treatment were referred to the Ophthalmology department after entering the data into a proforma.

The data was analyzed by using SPPS – 11. Descriptive statistics were calculated for all the variables. Mean and standard deviation was calculated for the quantitative variables that is age in years. Frequency and percentage were calculated for the qualitative variables that is genders, presence and type of retinopathy.

RESULTS

The study was completed in a period of 7 months from Sep 2010 to March 2011. A total of 196 patients fulfilling the criteria were included. (As calculated by WHO sample size calculator by keeping p = 15%[4], margin of error = 5% and confidence interval = 95%). Age range was 31 to 60 years; majority of them belonged to 4th decade (Table 1) with a mean age of 50.95 ± 10.12 years. 64.28% patients were males and 35.71% were females (Table 2). Diabetic retinopathy was observed in 25 (12.75%) patients with newly diagnosed type 2 diabetes mellitus. Out of these, 15 were males and 10 were females (Table 3). 16 (8.16%) patients among 12.75% were found to have background retinopathy, 6(3%) had pre proliferative and 3 (1.53%) had proliferative retinopathy (Fig. 1). The HbA1C (%) was found to be 9.5 ± 1.6 in the patients with diabetic retinopathy and 7.4 ± 2.5 in patients without diabetic retinopathy (Table 4).

Table 1: Age distribution of patients

Age in Years	No. of Patients n (%)
31 - 40	15 (7.65)
41 - 50	120 (61.23)
51 - 60	61 (31.12)

Table 2: Sex Ratio in Study Group

Sex	No. of Patients n (%)
Male	126 (64.28)
Female	70 (37.71)

Table 3: Sex Ratio of Diabetic Retinopathy in Study Group

Sex	No. of Patients n (%)
Male	15 (7.65)
Female	10 (5.10)

Table 4: Diagnostic parameters variations among the study group

Parameter	With Retinopathy	Without Retinopathy
Fasting plasma glucose (mg/dl)	221 ± 35.6	141.7 ± 39.4
HbA1C (%)	9.5 ± 1.6	7.4 ± 2.5

Out of the 16 patients with background retinopathy, 10 were males and 6 were females, whereas 4 males and 2 females had preproliferative retinopathy and 2 males and 1 female had proliferative retinopathy (Table 5).

Table 1: Sex ratio of different types of diabetic retinopathy in study group

Sex	No. of Patients n (%)
Background Retinopathy (n = 16)	
Male	10 (5.10)
Female	06 (3.06)
Preoperative Retinopathy (n = 06)	
Male	04 (2.04)
Female	02 (1.02)
Proliferative Retinopathy (n = 03)	
Male	02 (1.02)
Female	01 (0.51)

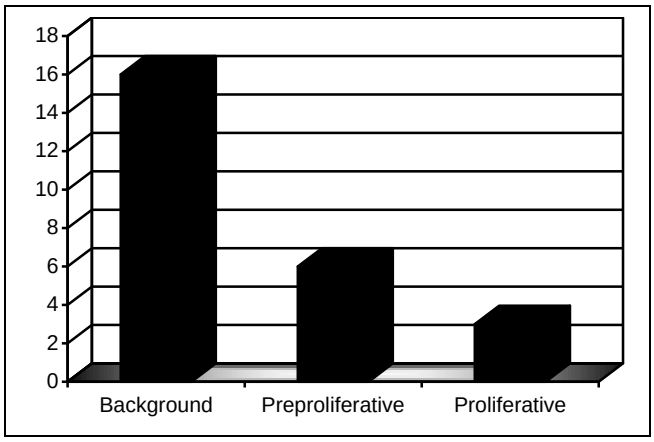

Fig. 1: Types of Retinopathy in Study Group: n = 196.

DISCUSSION

Diabetes mellitus is the most common endocrine metabolic disorder. The true frequency of patients having diabetes mellitus is difficult to ascertain because of differing standards of diagnosis but various studies have reported that prevalence of diabetes mellitus in Pakistan is around 5 – 7%[6]. Similarly it was estimated that in Pakistan the prevalence of diabetic retinopathy (DR) in diabetic patients is 12%[7] whereas others have reported the rates to be as high as 15%[8] to 19.9%[9]. DR is a major cause of blindness in those suffering from type 2 Diabetes. It is assumed globally that Diabetic retinopathy (DR) will be one of the most important causes of blindness in the future.

We conducted a prospective study among the newly diagnosed patients of type 2 diabetes mellitus and found that the diabetic retinopathy was present among 12.75% of the patients. A study done in southern parts of Pakistan showed 15% of newly diagnosed diabetics had retinopathy at the time of diagnosis[4]. Similarly a study from India reported this figure to be 10.2%[10] whereas in United Kingdom the prevalence of diagnosed retinopathy was reported to be 19%[11]. These differences could probably be because of ethnic variations, different gender and age groups presentations. This is evident by comparing our results with a similar study done in abbottabad[12]. They found the frequency to be 17% while their study group was with mean age of 45.1 ± 3.2 years consisting of predominantly females whereas in our settings the mean age was 50.95 ± 10.12 years and was predominantly male.

We found retinopathy predominantly to be background (8.16%), then pre-proliferative (3%) and proliferative (1.53%). These results are comparable to the findings of Hayat et al.[12]

In our study group HbA1C (%) was found to be 9.5 ± 1.6 and the fasting plasma glucose level was 221 ± 35.6 in the patients with diabetic retinopathy. These findings augment the association of HbA1c and fasting plasma glucose in patients with retinopathy as suggested by Abdollahi A[13] and Rema M et al[10]. Denmark[14] also suggested a strong correspondence of period of diabetes, HbA1c levels and systolic blood pressure with the severity of retinopathy.

The importance of eye examination of all diabetic patients at the time of diagnosis in preventing the blinding complications of DR. It further shows that age, gender, and glycemic control are associated with the onset and progression of DR.

CONCLUSION

The frequency of retinopathy in newly diagnosed patients of type 2 diabetes mellitus is 12.75% and stress the value of in depth ophthalmic assessment of every patient of diabetes at the time of diagnosis.

Author's Affiliation

Dr. Kashif Jamil
Department of Medicine
Punjab Medical College
Unit IV DHQ Hospital, Faisalabad

Dr. Yasir Iqbal
Asst. Prof. Ophthalmology
IIMC-T Pakistan Railways Hospital, Rawalpindi

Dr. Sohail Zia
Asst. Prof. Ophthalmology
IIMC-T Pakistan Railways Hospital, Rawalpindi

Dr. Qaim Ali Khan
Asst. Prof. Ophthalmology
Poonch Medical College, Rawalakot, AJK.

REFERENCES

1. **Rema M, Pradeepa R.** Diabetic retinopathy: an Indian perspective. India J Med Res. 2007; 125: 297-310.
2. **Kamal A, kamal A, Nazir A, Qaisera S.** Assessment of awareness regarding diabetic retinopathy among patients visiting diabetic clinic Sir Ganga Ram Hospital, Lahore. Esculapio J Services Inst Med Sci. 2008; 3: 10-3.
3. **Delcourt C, Massin P, Rosilo M.** Epidemiology of diabetic retinopathy: Expected vs. reported prevalence of cases in the French population. Diabetes Metab. 2009; 35: 431-8.
4. **Wahab S, Mahmood N, Shaikh Z, Kazmi HW.** Frequency of retinopathy in newly diagnosed type 2 diabetes patients. J Pak Med Assoc. 2008; 58: 557-61.
5. **World Health Organization.** The WHO diagnostic criteria of Diabetes of 1999 as revised in 2006 at the 19th World Diabetes Conference [Internet]. [updated 2009].
6. **Shera AS, Jawad F, Maqsood A.** Prevalence of diabetes in Pakistan. Diabetes Res Clin Pract. 2007; 76: 219–22.
7. **Wahab S, Mehmood N, Shaikh Z, Kazmi H.** Frequency of retinopathy in newly diagnosed type 2 diabetes patient. J Pak Med Assoc. 2008; 58: 557.
8. **Jamal-u-Din, Qureshi MB, Khan AJ, Khan MD, Ahmad K.** Prevalence of diabetic retinopathy among individuals screened positive for diabetes in five community-based eye camps in northern Karachi. J Ayub Med Coll Abbottabad. 2006; 18: 1-13.
9. **Al-Maskari F, El-Sadig M.** Prevalence of diabetic retinopathy in the United Arab Emirates: a cross-sectional survey. BMC Ophthalmology. 2007; 7: 11-9.
10. **Reema M, Deepa R, Mohan V.** Prevalence of retinopathy at diagnosis among type 2 diabetic patients attending a diabetic centre in South India. Br J Ophthalmol. 2000; 84: 1058-60.
11. **Kostev K, Rathmann W.** Diabetic retinopathy at diagnosis of type 2 diabetes in the UK: a database analysis. Diabetologia. 2013; 56: 109-11.
12. **Hayat AS, Khan AQ, Baloch GH, Sheikh N.** Frequency and pattern of retinopathy in newly diagnosed type 2 diabetic patients at tertiary care settings in abbottabad. J Ayub Med Coll Abbottabad. 2012; 24: 87-9.
13. **Abdollahi A, Malekmadani MH, Mansoori MR, Bostak A, Abbaszadeh MR, Mirshahi A.** Prevalence of diabetic retinopathy in patients with newly diagnosed type II diabetes mellitus. Acta Medica Iranica. 2006; 44: 415–9.
14. **Klein R, Klein BE, Moss SE, Linton KL.** The Beaver Dam Eye Study. Retinopathy in adults with newly discovered and previously diagnosed diabetes mellitus. Ophthalmology 1992; 99: 58–62.