Section: Ophthalmology

Original Research Article

PREVALENCE OF DIABETIC RETINOPATHY AMONG NEWLY DIAGNOSED TYPE 2 DIABETICS

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ABSTRACT

Background: Diabetic retinopathy (DR), a major microvascular complication of diabetes mellitus (DM), is one of the leading causes of visual impairment globally. While DR is commonly associated with longstanding diabetes, evidence suggests that retinal changes may be present even at the time of diagnosis. This study aimed to determine the prevalence of diabetic retinopathy among newly diagnosed type 2 diabetes mellitus (T2DM) patients in a tertiary care center in northern India.

Materials and Methods: A cross-sectional study was conducted over one year at Dr. R. P. Government Medical College, Kangra (Tanda), Himachal Pradesh. A total of 98 patients newly diagnosed with T2DM were enrolled after obtaining informed consent. Comprehensive ocular examination including fundus photography, slit lamp biomicroscopy, and macular thickness measurement was performed. Fasting blood sugar (FBS) and glycated hemoglobin (HbA1c) levels were recorded. Patients with media opacities, prior retinal disease, or gestational diabetes were excluded.

Results: Out of 98 patients, 57 (58.2%) were male and 41 (41.8%) female, with a mean age of 52.4±11.9 years. Diabetic retinopathy was observed in 4 patients (4.1%), all of whom had mild non-proliferative diabetic retinopathy (NPDR). A statistically significant association was found between higher FBS levels and presence of DR (p=0.004). However, the association with HbA1c was not statistically significant (p=0.138).

Conclusion: A notable proportion (4.1%) of newly diagnosed T2DM patients exhibited signs of DR at the time of diagnosis. This underscores the importance of early ophthalmologic screening in all newly diagnosed diabetics to enable timely intervention and prevent progression to vision-threatening stages.

Keywords: Diabetic retinopathy, Type 2 diabetes mellitus, Prevalence, Newly diagnosed diabetes, Ophthalmic screening, Northern India.

INTRODUCTION

Diabetes Mellitus is a heterogeneous group of metabolic disorders characterized by chronic hyperglycemia. The incidence of Diabetes Mellitus has increased dramatically over the recent decades; predominantly because of changes in life style and an increase in the prevalence of obesity and longevity. As a result, the complications of diabetes mellitus pose a great threat to the overall health situation in the world.

Although, Cardiovascular disease (CVD) is the leading macrovascular complication of T2DM and approximately half of the patients with T2DM die of cardiovascular causes, the microvascular complications are the major cause of social and financial burden of Diabetes.[1]

Diabetic retinopathy (DR) is a highly specific microvascular complication of DM,[2,3] and is one of the leading causes of blindness and visual impairment in adults.[4,5]

Global estimates report that, around 34.6% of all diabetics suffer from any form of retinopathy, and it is the leading cause of acquired blindness among adults of working age in industrialized countries.[6,7] Globally, it accounts for 5% of all cases of blindness.[8] This situation becomes worse when it

comes to non-industrialized countries where screening protocols are not strictly observed.

Microvascular complications at the time of diagnosis of diabetes mellitus are showing increasing trend in India. Early detection of micro vascular complications and its treatment at the time of diagnosis can prevent progression of these complications and hence decrease morbidity and mortality. So this study was planned with the aim to highlight the occurrence diabetic retinopathy changes at the time of diagnosis of diabetes in this region of northern India.

MATERIALS AND METHODS

This study was conducted for duration of one year among patients newly diagnosed with Type 2 diabetes mellitus attending OPD at Department of Ophthalmology and referred from other departments, Dr. R. P. Govt. Medical College, Kangra (Tanda), H.P.

All patients who were newly diagnosed with Type 2 DM and gave consent were included while those with ocular opacities, retinal diseases, choroiditis, or women with GDM were excluded.

Each patient underwent a comprehensive ocular examination, including visual acuity, colour vision, intra ocular pressure measurement, complete anterior segment examination, posterior segment examination with direct and indirect ophthalmoscope and slit lamp biomicroscopy, fundus photography and central macular thickness measurement.

Fasting blood sugar (FBS) and glycosylated haemoglobin (HbA1c) was done for each patient. Patients with poor glycaemic control were referred to the Medicine outpatient department for further management.

Table 1: Case Definition: Diabetes Mellitus -ADA criteria [47]

	Pre diabetes	Diabetes
HbA1C	5.7-6.4%	≥6.5%
FBS	100-125 mg/dl	≥126 mg/dl
RBS		≥200 mg/dl

RESULTS

Over a period of one year, a total of 98 patients who presented in the department of Ophthalmology, Dr.RPGMC Kangra at Tanda or were referred from other departments of our institution were included in this study. The observations were as follows:

There were 57 (58.2%) males and 41 (41.8%) females, with a male-to-female ratio of 1.39:1 with mean age of 52.4±11.9 years. A total of 4 (4.1%) patients had DR and all had dot and blot Haemorrhages.

Table 2: Profile of enrolled patients

		Frequency(%)/ Mean±SD
Gender	Male	57 (58.2%)
	Female	41 (41.8%)
Mean age (in years)	Male	51.5±11.9
	Female	53.7±11.9
	Total	52.4±11.9
DR	Mild NPDR	4 (4.1%)
	No DR	94 (95.9%)
Dot and Blot Haemorrhage	4	4.08
Hard Exudates	2	2.04
Flame Shaped haemorrhage	1	1
Circinate retinopathy	1	1

All the patients who had mild NPDR were males with no female having DR. There was no statistically significant difference observed in patients with DR in terms of sex distribution (p value 0.109). The mean age of patients having mild NPDR was 56.3±10.04 years while that of patients without DR was 52.3±11.89 with no statistically significant difference observed (p value 0.51).

Table 3: Mean FBS and HbA1C levels in enrolled patients

	Mild NPDR	No DR	Total	P Value
Mean FBS	181.3±10.24	153.6±18.81	154.7±19.3	0.004
Mean HbA1C	9.1±2.06	7.7±1.84	7.8±1.86	0.138

There was statistically significant association of FBS with DR with p value of 0.004 while HbA1C had no significant association.

DISCUSSION

In our study, the mean age of all patients was found to be 52.4±11.8 years while mean age of patients with mild NPDR was 56±10.04. Similar mean age was observed by F Harzallah et al,[9] Fang Li et al,[10] Kyung-Soo Kim et al,[11] Hillier and Pedula et al.[12] The higher age in patients with diabetic retinopathy compared to those without DR may be attributed to difference in time at which they seek medical attention as seeking medical attention at later periods can lead to diabetic complications.

There were more males were diagnosed with DM compared to females. Heydari et al,[13] and Damor V

et al,[14] in their study also observed that there were more males who presented with DM. This higher prevalence among males may be due to two reasons, firstly due to lifestyle difference and android adiposity in males which are risk factors for diabetes and secondly due to early medical attention seeking by males than females.

The prevalence of diabetic retinopathy in newly diagnosed diabetic patients as observed by us was 4.1%. This is in accordance with Sosale et al,[15] study which showed 6% patients had diabetic retinopathy at diagnosis of T2DM. Reema N et al,[16] observed prevalence of diabetic retinopathy in newly diagnosed diabetic patients as 5.1%.

Study by Hugar S et al,[17] and F Harzallah et al,[9] showed retinopathy in 8% of the newly diagnosed diabetic patients. The study by AL-Zamil et al,[18] showed retinopathy in 6.25% of newly diagnosed T2DM patients. The discrepancy in the prevalence can be attributed to the differences in the race, ethnicity, age, definition of newly diagnosed DM, method of detecting diabetic retinopathy and availability of health care facilities.[19]

In our study, mean FBS as observed by us was 154.7±19.3 mg/dl with mean FBS of 181.3±10.24 mg% in patients of mild NPDR and 153.6±18.81mg% in rest of patients without diabetic retinopathy. There was statistically significant difference between the groups in terms of mean FBS levels with p value of 0.004. Similarly, Jamil K et al,[20] and Wahab S et al,[21] observed that mean FBS was higher in patients with DR compared to those without DR.

We observed that the mean HbA1C was 7.8±1.86% with mean HbA1C of 9.1±2.06 and 7.7±1.84 in patients with mild NPDR, and patients without diabetic retinopathy respectively. There was no statistically significant difference between the groups in terms of mean HbA1C (p value 0.138) however, mean HbA1C levels were higher in patients with diabetic retinopathy than those without diabetic retinopathy. Amini M et al,[22] also observed that mean HbA1C level in patients with diabetic retinopathy was 9.9±2 where as in patients without diabetic retinopathy, the mean level was 9.5±2.3%. The mean levels were higher in patients with diabetic retinopathy as compared to those without diabetic retinopathy but the difference was not statistically significant.

Abdollahi A et al,[23] and Rema M et al,[24] stated that there is correlation of HbA1c and fasting plasma glucose in patients with retinopathy and Klein R et al,[25] also suggested a strong correlation of duration of diabetes and HbA1c levels with the severity of retinopathy.

CONCLUSION

Microvascular complications like diabetic retinopathy are a major cause of morbidity in patients with type 2 diabetes mellitus. In our study, four out of ninety-eight newly diagnosed T2DM patients presented with diabetic retinopathy.

All the patients who presented with diabetic retinopathy had Mild NPDR. This is a comforting sign since patients presenting at an earlier stage of retinopathy can be treated to prevent the progression of the disease and visual loss. Therefore, early screening for diabetic retinopathy is important for newly diagnosed diabetic patients. A systematic screening program in the community is needed for early detection and to reduce blindness in diabetic patients.

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