



CLINICAL PROFILE OF PATIENTS WITH DIABETIC RETINOPATHY IN RURAL TERTIARY CARE CENTER

Ophthalmology

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ABSTRACT

INTRODUCTION: The present study was aimed at evaluating the clinical profile of DR in diabetic patients visiting a rural tertiary care hospital of Western Maharashtra.

MATERIAL AND METHODS: The study was observational cross-sectional, conducted in the Department of Ophthalmology, Pravara Rural Hospital, Loni, Maharashtra. Data regarding the age, gender, body mass index, random blood sugar level, blood pressure, were recorded in a well-structured case record form.

RESULTS: Out of 1377 patients of diabetes 318 patients (23.09 %) presented with Diabetic Retinopathy. Most of the patients belonged to stage I Non-Progressive Diabetic Retinopathy (NPDR). There was a statistically significant difference in number of patients with respect to hypertension and stage of DR.

CONCLUSION: Mild NPDR was most common form of DR and there was a descending trend of numbers with increasing severity of disease. Hypertension was associated with severity of DR.

KEYWORDS

Diabetic Macular Edema, Diabetic Retinopathy, Hypertension, Blood Sugar Level.

INTRODUCTION:

Diabetes mellitus is a metabolic disease the incidence of which is increasing at an alarming rate. International Diabetes Federation reported about 7.4 crore patients of diabetes in India in the year 2015 and estimated that there would be over 12.3 crore patients of diabetes by the year 2040.¹ Diabetic retinopathy (DR) is one of the microvascular complications of the eye which causes progressive loss of vision and blindness. The prevalence of diabetic retinopathy in India varies between 9.6%–21.7% according to studies done in India.²⁻⁶ Among the type 1 and type 2 diabetic patients, the occurrence of visual impairment is 86% and 33%, respectively. The blindness develops in 75% of Type 2 diabetic patients 15 to 20 years after diagnosis.⁷ Diabetic retinopathy has become one of the important diseases causing blindness and has become focus of the National programme for control of blindness (NPCB)¹⁰ and vision 2020 India.^{8,9}

There is paucity of data related to the clinical profile of patients with diabetic retinopathy in Indian scenario. This hospital based, observational study focuses on occurrence of various stages of diabetic retinopathy in western Maharashtra.

MATERIAL AND METHODS

This observational cross-sectional study was conducted in the Department of Ophthalmology, in a tertiary care rural hospital in western Maharashtra, after obtaining approval of institutional ethics committee.

Patients with type 2 DM diagnosed with diabetic retinopathy attending the outpatient department and gave informed written consent about participation in the study were included in the study.

Patients with retinopathy in the absence of Diabetes Mellitus and due to other causes like radiation and sickle cell disease were excluded.

Data regarding age, gender, random blood sugar level and blood pressure were recorded in a structured proforma. Screening of retina was performed with Direct and indirect Ophthalmoscopy after dilatation of pupils with 1% Tropicamide. The retinopathy was classified in accordance with the diabetic retinopathy study classification (ETDRS)^{7,10}. Descriptive statistics was used for analysis of the study.

RESULTS:

Total of 1377 patients having diabetes were screened for DR. Out of this, 318 patients (23.09 %) were found to have DR. According to the staging of retinopathy, 158 (11.47%), 94 (6.82%), 24 (1.74%), 31 (2.25%) and 11 (0.79%) patients belonged to NPDR mild (I), moderate (II), severe (III), very severe (IV) and Proliferative Diabetic Retinopathy

respectively. On categorizing the DR into Non proliferative (NPDR) consisting of stage I, II, III and IV NPDR and Proliferative DR (PDR), the occurrence is 21.85% and 0.79%, respectively.

The number of males (179, 56.3%) were more as compared to females (139, 43.7%). As shown in figure no. 1., the number of males were more or equal (stage III NPDR) in all groups of patients except PDR. Number of patients were more in age group of more than 60 years (180, 56.6%) followed by 45-60 years (104, 32.7%) and less than 46 years (40, 12.57%). Figure no. 2. depicts the age wise distribution of patients wherein it is observed that patients belonged to age group of more than 60 years in all stages of DR.

Table no. 1. shows distribution of patients according to clinical features. There was a statistically significant difference in number of patients with respect to hypertension and stage of DR (*P= 0.0049, Chi-squared Test for Independence). However, with respect to random blood sugar levels (categorized into controlled and uncontrolled) and staging of DR, no significant difference in number of patients was seen (*P= 0.3258, Chi-squared Test for Independence). Macular edema was observed in 59 (4.28%) diabetic patients. It was seen in all types of DR except stage I NPDR, with larger proportion seen in stage III (19, 79.16%) followed by stage IV (22, 70.96%) and PDR (6, 54.54%).

DISCUSSION:

Diabetic retinopathy is one of the common causes leading to blindness. The present study was aimed at studying the clinical profile of DR in terms of the ophthalmic examination.

Ramawat et al¹¹ found occurrence of DR, NPDR and PDR in urban and rural Western India as 33.9%, 25.6% and 8.3% respectively, among 168 patients. Rema M et al¹², in a study conducted in urban and rural South India among 6792 patients, reported occurrence of DR, NPDR and PDR in 34.1%, 30.8%, 3.4% patients, respectively. In the study by Agrawal RP et al¹³ (n=4067) the percentage was respectively 28.9%, 23.06% and 5.9%. Narendran V et al¹⁴. (n=260) studied the occurrence of DR, NPDR and PDR in urban and rural Population of South India and found it to be 26.2%, 24.6% and 1.6% respectively. However, in studies done by Rema M et al¹⁵ (n=1332) and Mahesh G et al¹⁶ (n=323) conducted in south India, the occurrence of DR was 17.6% and 20.12% respectively. The occurrence of PDR in their study was only 0.9% and zero %, respectively. The occurrence of DR in the present study done in rural population of Western Maharashtra, was 23.09%, which is similar to that seen in the studies by Mahesh et al¹⁶ and Narendran et al¹⁴, while it was lower as compared to studies done by Agrawal et al¹³, Ramawat et al¹¹ and Rema et al¹². Similarly, the occurrence of PDR in the present study was only 0.79% as compared to that seen with

Ramavat PR et al¹¹, Rema M et al¹², Agrawal R P et al¹³, and Narendran V et al¹⁴, while it was similar to that seen in the study by Rema M et al¹⁵. The difference in the occurrence of DR may be due to differences in the type of population studied, as well as the geographical differences in the population. This can be explored and confirmed by doing a large-scale study including regions all over the country.

The number of males (179, 56.3%) were more as compared to females (139, 43.7%). The finding was similar to those done by Krishnaiah S et al¹⁷, Rema et al¹⁵ and Gadkari et al¹⁸.

With respect to age group, the number of patients were more older age group. The observation was similar to studies done by Ramavat PR et al¹¹, Agrawal et al¹³, Gadkari et al¹⁸ and Rema et al¹². This observation supports, although not directly, the fact that severity of DR increases with increase in the duration of diabetes¹⁹.

Table no. 1. shows distribution of patients according clinical features. There was a statistically significant difference in number of patients with respect to hypertension and staging of DR (*P= 0.0049, Chi-squared Test for Independence). Similar findings were observed in a study by Ramavat PR et al¹¹. Klein²⁰, Tapp et al²¹, VanLeiden²², Hove et al²³, Leske et al²⁴, Rema M et al¹⁵, and Wong et al²⁵.

Although the exact pathogenesis of DR with respect to hypertension is not clear, the available evidence suggests hemodynamic alternations and expression of vascular endothelial growth factor to in retinal vasculature as the probable mechanism^{17,26}. Diabetes associated with hypertension is an independent risk factor for progress of diabetic retinopathy²⁷. Our study supports the finding.

The severity of hyperglycemia is to cause DR and there is a strong relationship between HbA1C level and progression of retinopathy²⁸. In the present study random blood glucose levels was assessed. With respect to random blood sugar levels the patients were categorized as controlled and uncontrolled. When compared with the of DR, no significant difference in number of patients was seen (⁶P= 0.3258, Chi-squared Test for Independence). As random blood glucose level is subject to many factors like fasting, consumption of antidiabetic medication before blood withdrawal, time of blood withdrawal etc., it is not a reliable indicator for predicting the sugar control with medications. While HbA1C level are prescribed for such studies, it was not performed and is limitation of the study. Also, a smaller sample size may also lead to insignificant results.

Macular edema was observed in 59 (4.28%) diabetic patients. Our study supports the observation that the occurrence of macular edema is much lower than that of DR, which is supported by many studies²⁹⁻³⁴. Macular edema was seen in all stages of DR except stage I NPDR, with larger proportion seen in stage III (19, 79.16%) followed by IV (22, 70.96%) and PDR (6, 54.54%). Thus, with progression of DR, the risk of development of macular edema increases.

Conclusion:

The occurrence of DR in the present study was 23.09%. Mild NPDR was most common form of DR and there was a descending trend of numbers with increasing severity of disease. DR was more common in males and elderly population. Hypertension was associated with severity of DR. Macular edema was seen in all stages of DR except mild NPDR.

Figure no. 1. Distribution of patients according to gender.

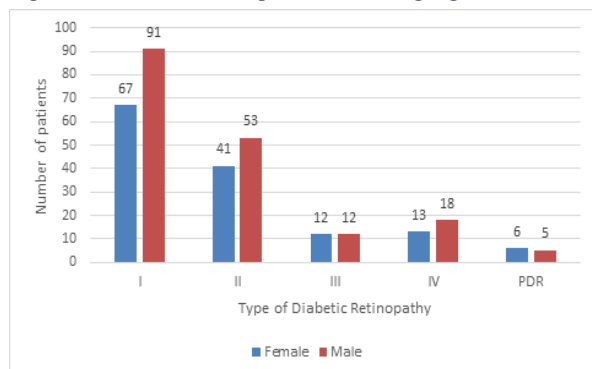


Figure no. 2. Distribution of patients according to age groups.

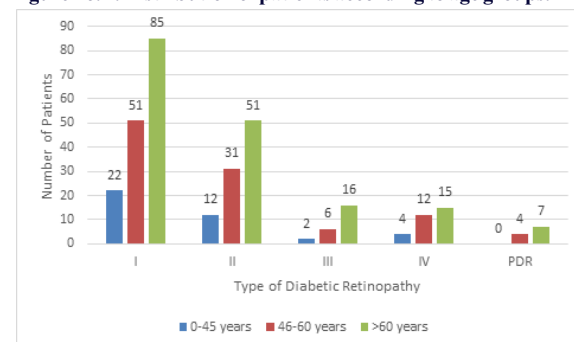


Table no. 1. Distribution of patients according to the clinical features.

	Type of Diabetic Retinopathy				
	Grade I (%)	Grade II (%)	Grade III (%)	Grade IV (%)	PDR (%)
Status of Blood pressure (Number, %)*					
Hypertensive	77 (48.7)	37 (39.4)	19 (79.2)	19 (61.3)	7 (63.6)
Normotensive	81 (51.3)	57 (60.6)	5 (20.8)	12 (38.7)	4 (36.4)
Status of Blood sugar control (Number, %)#					
Uncontrolled	86 (54.4)	40 (42.6)	10 (41.7)	15 (48.4)	4 (36.4)
Controlled	72 (45.6)	54 (57.4)	14 (58.3)	16 (51.6)	7 (63.6)
Macular edema (Number, %)#					
Present	0	12 (12.76%)	19 (79.16%)	22 (70.96%)	6 (54.54%)
Absent	158	82	5	9	5
Total	158 (49.69 %)	94 (29.56%)	24 (7.55%)	31 (9.75%)	11 (3.46%)

*P=0.0049, Chi-squared Test for Independence

#P=0.3258, Chi-squared Test for Independence

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