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Medicine

Prevalence of Diabetic Retinopathy in Diabetic Patients in a Diabetic Eye Camp

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Abstract		**Original Research Article**

To estimate the prevalence of Diabetic Retinopathy and to find its association with age, gender and control of diabetes mellitus, blood pressure and daily exercise and eating healthy diet. *Methods:* This was a hospital based cross-sectional study conducted in the drishti the vision eye hospital vijaynagar indore. A total of 700 diabetes mellitus patients attending a diabetic eye camp underwent detailed history, blood pressure, blood sugar measurement and ocular examinations for diabetic retinopathy. The International Classification of diabetic retinopathy was followed to categorize the severity of retinopathy. *Results:* The overall prevalence of diabetic retinopathy was 105 (15%) patients, out of which, 55(52%) were males and 50 (48%) females. 98(93%) had non proliferative diabetic retinopathy among which, 60 (57%) had mild, 30 (28%) moderate and 8 (7%) severe retinopathy, whereas 7 (6.67%) patients had proliferative diabetic retinopathy. 20 (19%) were observed to be suffering from macular edema which on further classification showed as 9(45%) mild, 7 (35%) moderate and 4 (20%) severe edema. Two groups 'more caring' and 'less caring 'were defined depending upon control of blood sugar, blood pressure, daily exercise and eating habbits. *Conclusion:* This study estimated the prevalence of diabetic retinopathy in a hospital-based diabetic population (15%). Duration of diabetes mellitus is the strongest factor associated with development of diabetic retinopathy. Development and progression of diabetic retinopathy is delayed in 'more caring group'. Our study made the patients more aware about control of blood sugar, blood pressure and encouraged adopting a regular exercise lifestyle and eating healthy foods containing lot of fruits and vegetables.
Keywords: Diabetic retinopathy, macular edema, diabetes mellitus, prevalence.

INTRODUCTION

Diabetes Mellitus, a global epidemic, is a consortium of diseases linked to chronic hyperglycemia due to insulin resistance [1]. The incidence rates of diabetes mellitus has increased alarmingly with World Health Organization predicting the occurrence of more than 200 million type 2 diabetes cases in the next decade[2]. India has 31.7 million diabetic patients and the number is expected to increase upto 79.4 million by 2030[3]. Indians are highly vulnerable to diabetes with 7.1% of adult population (>62 million) suffering from Diabetes Mellitus [4]. Diabetic Retinopathy (DR), one of the most serious complications of Diabetes Mellitus has become the leading cause of vision loss resulting in irreversible blindness among adults [5, 6] and is estimated to affect 20% of people with diabetes. The chances of developing DR increases with age and males are more prone to its development. This condition is of vascular origin, and is characterized by signs of retinal ischemia as well as signs of increased vascular permeability [7]. The development of DR depends on a variety of factors, such as the duration of diabetes, effective glucose control, and blood pressure and blood lipid levels [8]. It is a well-known fact that retinopathy often goes unnoticed until vision loss occurs; hence early detection, timely treatment and appropriate care can protect or delay the vision loss [9]. High prevalence of DR also imposes a large economic burden and public health concern on the national healthcare system. This emphasizes the need for epidemiologic studies on diabetes-related complications among the diabetic population. We aim to estimate the prevalence of DR and to find its associations with age, gender, the effect of duration of diabetes, control of blood sugar, blood pressure, doing regular exercise and eating healthy foods on the severity and progression of DR among diabetic patients.

MATERIALS AND METHODS

Study design

This was a hospital based cross-sectional study conducted in the Drishti the Vision Eye Hospital Vijaynagar Indore. An eye camp for known diabetic patients was organized for one week. Blood sugar levels, blood pressure checkup, visual acuity, refraction, tonometry, fundus examination was done in all the

patients Detailed history regarding eating and exercise habbits, control of blood sugar and blood pressure were obtained from each patient.

**Procedure for assessing DR**

Visual acuity was assessed by Snellen chart. To diagnose DR in diabetic patients, 90D and binocular indirect ophthalmoscopy examination was done after dilating the pupils of both eyes by 1% Tropicamide eye drops. Fundus photographs were also taken.

Retinopathy was classified according to the International classification of Diabetic Retinopathy [10] as Non proliferative diabetic retinopathy (NPDR) and proliferative diabetic retinopathy (PDR). On the presence of diabetic macular edema (DME), the patients were further classified into mild, moderate or severe macular edema [10].

RESULTS

Table-1: Prevalence and frequency distribution of patients

SEX	DM	percentage % DM	diabetic retinopathy	percentage % DR
Males	375	53.57%	55	52.38%
Females	325	46.42%	50	47.61%
Total	700	100%	105	100%
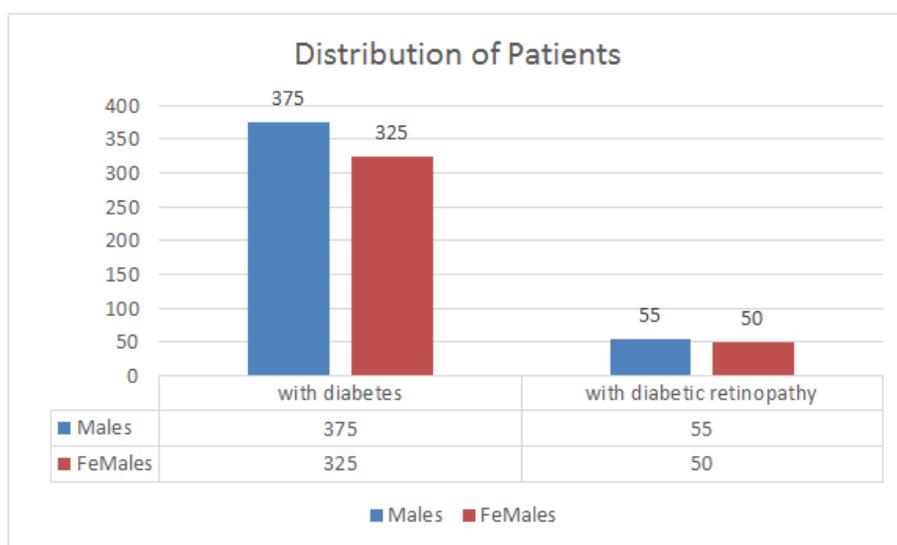
The overall prevalence of DR has been represented in Table 2. In our study, out of 700 patients

with DM, 15 % had DR, among which, more males were affected (52.38%) than females (47.6%).

Table-2: Different groups of DR

Severity Of DR	Number	Number %
Mild NPDR	60	57.14%
Moderate NPDR	30	28.57%
Severe NPDR	8	7.62%
PDR	7	6.67%
Total	105	100%

Table 2 shows the classification of severity of patients with diabetic retinopathy as NPDR, PDR. It was observed that out of 105 patients with DR, 98 (93%) had NPDR, which on further categorization,

showed 60 (57%) with mild, 30 (28%) with moderate and 8 (7%) with severe NPDR, whereas 7 (6.6%) patients had PDR.
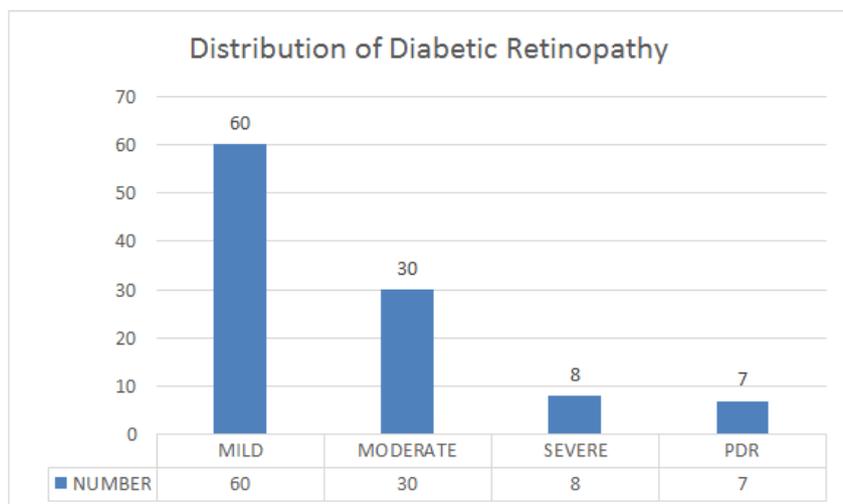
Table-3: Severity of Macular Edema

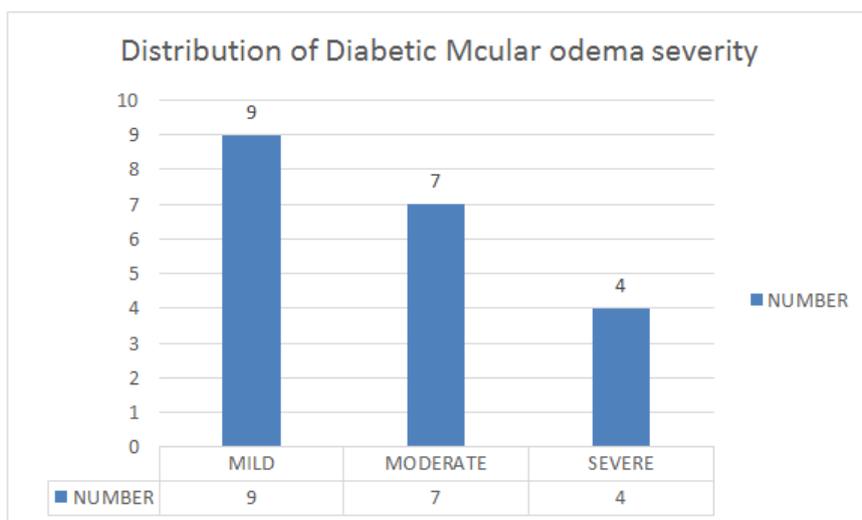| Severity	Number	Number %
Mild	9	45%
Moderate	7	35%
Severe	4	20%
Total	20	100%

Table 3 shows the patients with ME were 20 (19%), among which 9 (45%) were mild, 7 (35%) were moderate and 4(20%) patients suffered from severe ME.

Table 4 shows the prevalence of diabetes, diabetic retinopathy, and diabetic macular odema in different age group of patients.

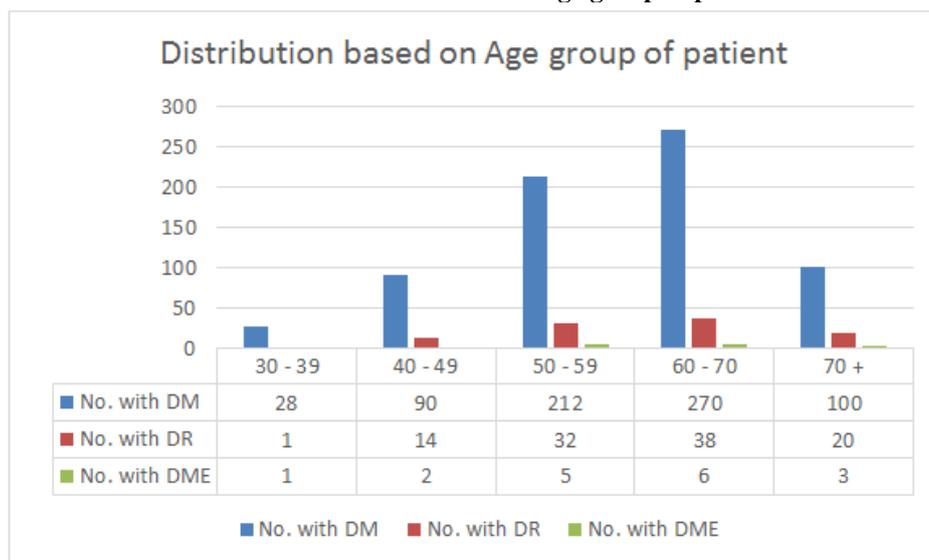**Table-4: Distribution based on Age group of patient**

	30 - 39	40 - 49	50 - 59	60 - 70	70 +
No. with DM	28	90	212	270	100
No. with DR	1	14	32	38	20
No. with DME	1	2	5	6	3

Table-5: Development of diabetic retinopathy based on the duration of DM

Duration of DM	No. with DM	percentage % with DM	No. with DR	percentage % with DR	No. with DME	percentage % with DME
< 5 yrs	168	24	1	0.59%	1	.59%
5-9 yrs	222	31.71	5	2.25%	2	.9%
10-14 yrs	110	15.71	25	22.72%	3	2.72%
15-19 yrs	112	16	40	35.71%	5	4.46%
>20 yrs	88	12.57	34	38.63%	9	10.22%
	700	100	105		20	

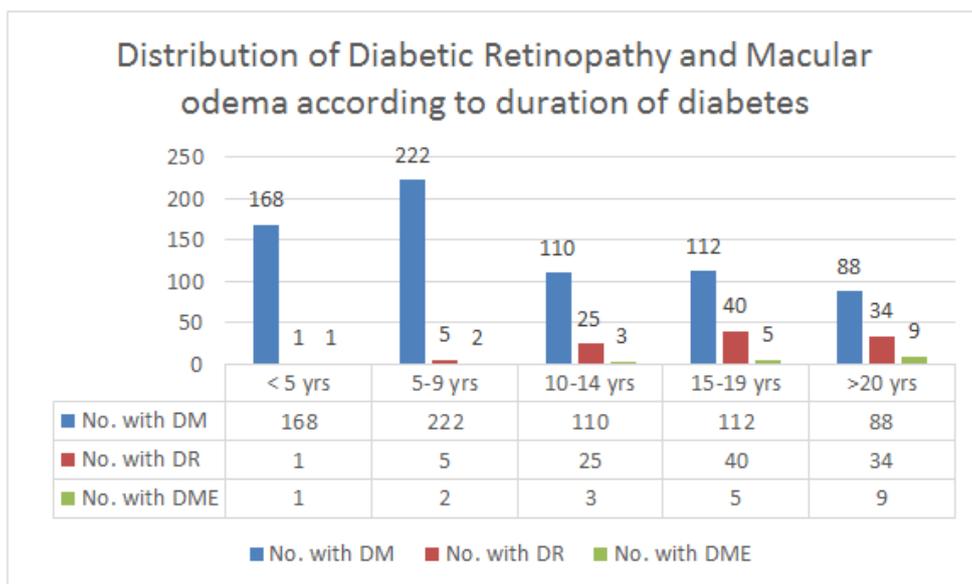|	< 5 yrs	5-9 yrs	10-14 yrs	15-19 yrs	>20 yrs
No. with DM	168	222	110	112	88
No. with DR	1	5	25	40	34
No. with DME	1	2	3	5	9

Table 5 represents the development of DR among diabetic patients based on its duration. The duration of diabetes was seen to be highest in 88 patients (more than 20 years), of which, 34 (38.63 %) were affected with retinopathy and 9 (10.2%) with diabetic macular odema. One hundred and ten patients had diabetes for 10-14 years, including 25 (22.72 %) with DR and 3 (2.7 %) with macular odema. Out of 112 patients with diabetes for a period of 15-19 years, 40 (35.71 %) developed retinopathy and 5 (4.46 %) developed macular odema. On the other hand, 5 (2.25 %) developed retinopathy among 222 patients having diabetes for 5-9 years and 1(.59 %) had retinopathy among 168 patients who were diabetic for less than 5 years.

DISCUSSION

Diabetic retinopathy is one of the most severe microvascular complications in patients with diabetes and is a leading cause of irreversible vision loss in working-aged adults (20–74 years). The high prevalence of DR in type 2 diabetic patients imposes a large economic burden. Severity of hyperglycemia, presence of hypertension and duration of diabetes are widely recognized as major risk factors for the development of DR [11, 12]. In our study, the prevalence of DR was 15% and similar to that observed by Rema *et al.* (17.6%) and Raman *et al.* (18.1%) in studies done in the southern states of India[13,14]. Even NPDR was more prevalent as compared to PDR just like in other studies done in South India. This may further suggest that the possibility of differences in the prevalence of DR may be non-existent among type 2 diabetic patients of different geographical origins and ethnic groups; however the possibility may be explored by doing larger population based studies across the country. We observed the duration of diabetes to be related with the development of DR and the percentage of patients affected with DR increases with the increasing duration of Diabetes Mellitus. According to our findings, DR appeared as early as <5 yrs of DM in 1.5% of the population and 38% patients developed DR after 20 years of DM. This observation strengthened the fact that the duration of DM is the single most common predictor to affect the severity of DR. [15, 16]. On categorization of DR based on its severity, we observed that the maximum number of patients had mild NPDR followed by moderate and severe forms. The diabetic patients above 80 years of age were found to have the highest prevalence of DR whereas the lowest prevalence was seen between 30-39 years of age. We further found that that chance of development and progression of diabetic retinopathy is delayed in 'more caring' group. This group adopts healthy living style, regular blood sugar estimation and blood pressure is also well controlled.

CONCLUSION

This study estimated the prevalence of DR in hospital based diabetic population (15%). The study also observed development of diabetic retinopathy delayed by adopting regular blood pressure, blood sugar control. Development and progression of diabetic retinopathy is also delayed by doing regular exercise and eating more leafy vegetables and fruits.

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