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Awareness of diabetic retinopathy in diabetic patients attending eye OPD in a tertiary care hospital in north India

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Abstract

Introduction: The most prevalent microvascular side effect of diabetes mellitus (DM) and the leading cause of avoidable blindness is diabetic retinopathy (DR). Out of people with diabetes, around 34.6% will develop any DR, and 10.2% will develop sight-threatening DR. The treatment of DR is effective for the preservation of sight. Therefore, its early diagnosis becomes important. There is limited data available on the awareness of DR. Therefore, we did this study to assess the awareness of DR in this region.

Aim & Objectives: To assess awareness of diabetic retinopathy in diabetic patients attending Ophthalmology OPD in a tertiary care hospital in North India.

Material & Methods: This is a prospective cross-sectional study conducted in the Department of Ophthalmology, Christian Medical College, Ludhiana. A total of 160 diabetic patients in the age group of 18 -75 years were included in this study. They were asked to fill the questionnaire and their responses were noted.

Results: The study assessed diabetic retinopathy (DR) awareness and care among participants. Of the respondents, 46.3% were male and 53.8% were female, with most participants in the age group of 40-69 years. A significant 52% had a family history of diabetes. While 51.2% knew eye check-ups should be every 6 months and 44.4% understood the need for regular screenings regardless of symptoms. The majority (58.1%) believed good diabetes control could prevent DR, and healthcare professionals were the main source of information (75.6%). Regarding treatment, 43.1% believed DR is treatable with good diabetes control (30.6%), laser therapy (36.3%), and surgery (33.1%). Additionally, 55% felt diabetics should consult an ophthalmologist when blood sugar is poorly controlled, while 30% thought regular exams were necessary when blood sugar is controlled.

Keywords: Diabetes mellitus, diabetic retinopathy, awareness

Introduction

The most prevalent microvascular side effect of diabetes mellitus (DM) and the leading cause of avoidable blindness is diabetic retinopathy (DR). Recent figures from the World Health Organization (WHO) indicate that over 425 million people worldwide have diabetes, with the majority residing in low and middle-income countries^[1].

ICMR-INDIAB research survey indicates that 7.3% of Indians have diabetes, with variations ranging from 4.3% in Bihar to 10% in Punjab^[2].

Approximately 27.0% of individuals with diabetes globally are affected by DR, leading to an estimated 0.4 million cases of blindness worldwide. It is estimated that around 80% of individuals with type 2 diabetes will develop retinopathy^[3].

Stabilizing vision or reducing the pace of visual degradation is the goal of DR treatment. In order to begin therapy as soon as possible, it is crucial to screen DM patients by looking at the fundus^[4].

Out of people with diabetes, around 34.6% will develop any DR, and 10.2% will develop sight-threatening DR. Complications of DR can be aggravated by prolonged DM, uncontrolled glucose levels, hypertension, hypercholesterolemia, smoking and ageing^[5].

Materials and Methods

This was a prospective, cross-sectional study that was conducted in the Department of Ophthalmology, Christian Medical College, Ludhiana. All patients in the age group of 18-75

years were included in this study. A total of 160 patients who fulfilled the inclusion criteria were included in this study. A detailed history was taken. The patients were asked to fill the questionnaire and their responses were noted [6, 7]. At the end of each session with the patients, a pamphlet containing information on diabetic retinopathy was provided to them, in three languages: English, Hindi and Punjabi. This pamphlet will raise awareness about the disease and was made by the Ophthalmology Department, CMC, Ludhiana.

Inclusion Criteria

All patients between 18 and 75 years of age

Exclusion Criteria

Patients having previously known cognitive impairment that could affect their ability to complete the questionnaire

Sample Size

The prevalence of Diabetic Retinopathy (DR) is assumed to be 27%. Therefore, the minimum sample size is estimated to be N=160, by using the formula $N = Z^2 * p * (1-p) / d^2$, where Z=1.96, is standard normal deviate at 95% confidence level, p=6% proportion of diabetic patients and d is the margin of error (4%) [8].

Statistical Analysis

The data was entered into Microsoft excel sheet. Data was summarized using frequency distribution and descriptive

analysis. Chi square test or Fisher’s exact test was used to find the association of categorical variables between the groups. The normality of the data was assessed through the statistical test and graphical method. The p-value of 0.05 was considered as statistically significant. All the statistical analysis was performed using IBM SPSS (Statistical Packages for Social Sciences, version 26.0. Armonk, NY: IBM corp.).

Results

This was a cross-sectional study in a total of 160 diabetic patients in the age group of 18-75 years attending ophthalmology OPD, over a period of 3 months.

Age distribution

The age distribution of participants in the study shows that 0.6% were between 20 and 39 years of age, while the largest group, accounting for 37.5%, fell within the 40-59 years age range. A similar proportion, 36.9%, were aged 60-69 years, and 25% of participants were 70 years and above. This distribution suggests that the majority of participants were from the middle-aged and elderly groups, with the highest concentration in the 40-69 years range. (Table 1)

Gender distribution

The gender distribution of participants in this study revealed that 46.3% were male and 53.8% were female. This shows a slightly higher representation of female patients compared to male patients in the study population. (Table 1)

Table 1 Demographics

Age	Categories	percentage
	20-39	0.6%
	40-59	37.5%
	60-69	36.9%
	>70	25%
Gender	Male	Female
	46.3%	53.8%

Family History of Diabetes

It was found that 52% of participants reported having a family history of diabetes, while 48% did not have a family history in our study. (Fig 1)

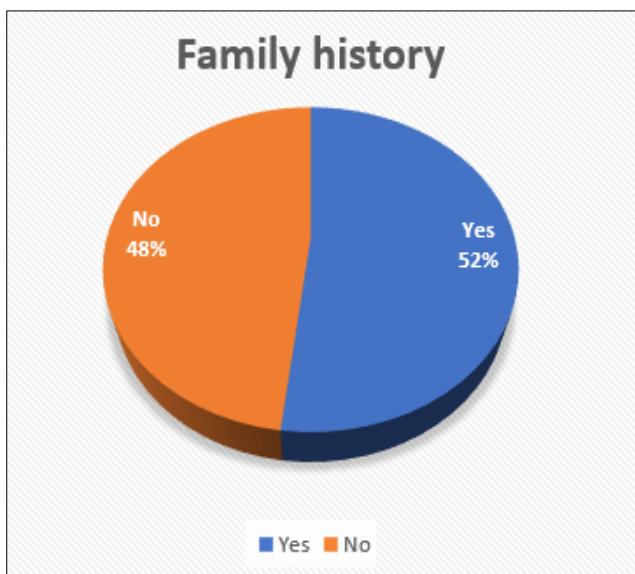


Fig 1: Family History

Effect of diabetes on eyes

The study found that 58% of the participants were aware of diabetic retinopathy (DR) as a potential complication of diabetes. Awareness levels varied based on factors such as the duration of diabetes, previous ophthalmic consultations and family history of diabetes. (Table 2)

Knowledge about complications in controlled diabetes

A total of 48.8% of people believed that individuals with controlled blood sugar levels could still experience eye complications, while 28.7% disagreed, and 22.5% were unsure. (Table 2)

Awareness of diabetic retinopathy screening

The findings indicate that 44.4% of participants understood the need for regular eye screenings, even in the absence of apparent eye problems. In contrast, 24.4% believed that screening was unnecessary without symptoms, and 31.3% were uncertain. (Table 2)

Recommended frequency of eye screening

Only 51.2% of participants knew that the recommended frequency for eye check-ups was every 6 months. Meanwhile, 26.9% believed that an annual check-up was sufficient, 16.9% thought an eye exam was only necessary when experiencing vision problems, and 5% were unaware of the recommended frequency. (Figure 2)

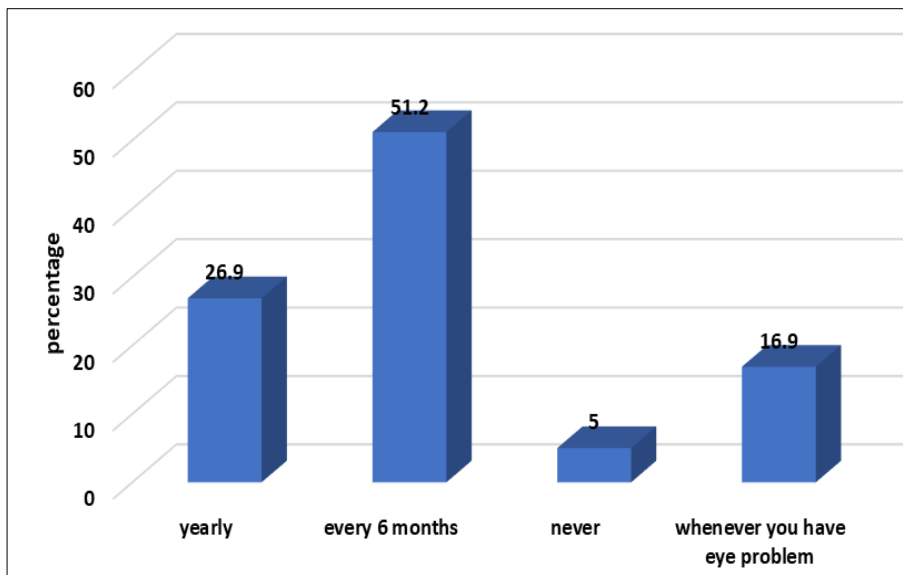


Fig 2: frequency of eye examination

DR prevention through effective diabetes management

The study revealed that nearly six in ten (58.1%) believed that good diabetes control could help prevent DR. Conversely, a significant minority (14.4%) disagreed, while over two-fifths (27.5%) remained uncertain. (Table 2)

Source of information

Healthcare professionals were the most commonly cited source of information about DR, accounting for 75.6% of participants. Family members served as the source for 6.3%, while television and radio were cited by 18.1% of participants. (Figure 3)

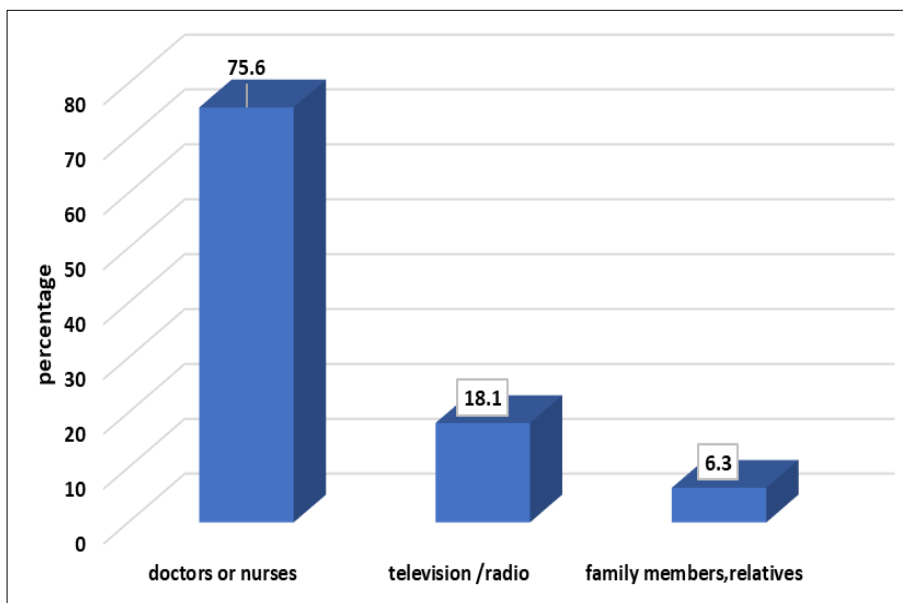


Fig 3: How did you get to know about diabetic retinopathy

Eye examination in the past year

A significant portion of respondents (58.1%) had an eye examination in the past year, highlighting a relatively good level of adherence to eye care practices. However, the remaining 41.9% had not undergone an eye examination. (Table 2)

Diabetic retinopathy treatment options: The majority of respondents (43.1%) believed that diabetic retinopathy is

treatable, while 25% thought it was not, and 31.9% were unsure. (Table 2)

Treatment approach for diabetic retinopathy

Around 30.6% recognizing good diabetes control as a key approach. Additionally, 36.3% cited laser therapy as a treatment option, while 33.1% mentioned surgery. (Figure 4)

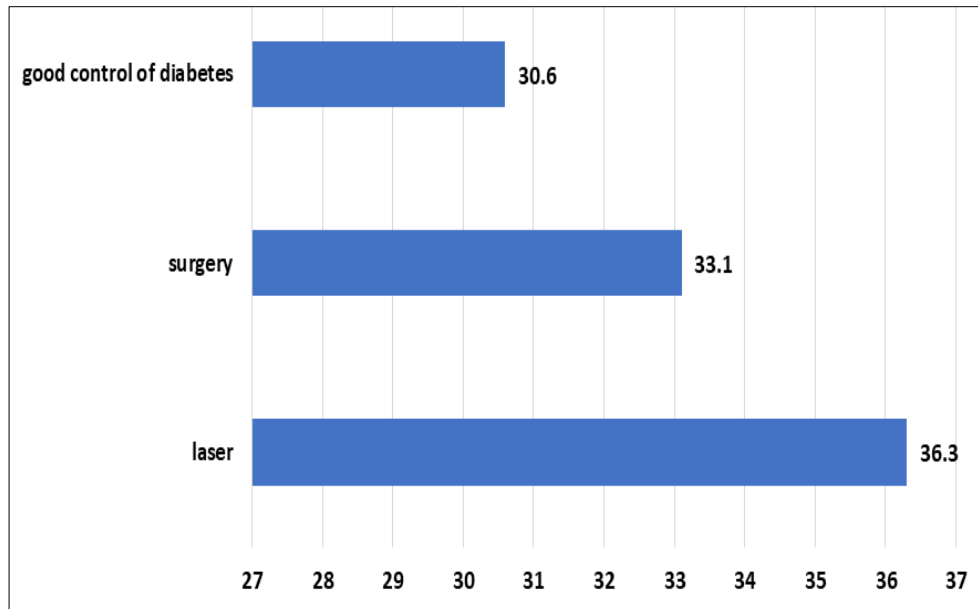


Fig 4: Do you know what's the treatment available for diabetic

Ophthalmological consultation for diabetics

The findings indicate that 55% of respondents believed that diabetics should consult an ophthalmologist when the sugar levels are poorly controlled. Additionally, 30% considered

regular eye exams necessary when blood sugar levels are controlled, and 15% believed eye exams were required when blood sugar levels are normal. (table2)

Table 2: Questionnaire

S. No	Question	Yes	No	Maybe	
1.	Do you think diabetes can affect your eyes	76.9%	13.1%	10%	
2.	Do you think individuals with controlled diabetes can have eye complication	48.8%	28.7%	22.5%	
3.	Do you think a good control of Diabetes might prevent DR?	58.1%	14.4%	27.5%	
4.	Is there a need for the regular screen for DR if both eyes are good	44.4%	31.3%	24.4%	
5.	Do you think retinopathy is a treatable condition?	43.1%	25%	31.9%	
6.		Laser	Surgery	controlled diabetes	
7.	Do you know what's the treatment available for diabetic retinopathy	36.3%	33.1%	30.6%	
8.	How will you get to know about diabetic retinopathy	Doctor/nurse	Television radio	Family	
		75.6%	18.1%	6.3%	
9.	When do you think you should visit an ophthalmologist	controlled	Poorly controlled	Normal	
		30%	55%	15%	
10.	How frequently you should get your eye examined	Yearly	6 months	Eye problem	Never
		26.9%	51.2%	16.9%	5%

Discussion

This study was done in a total of 160 diabetic patients in the age group of 18-75 years over a period of 3 months.

The purpose of this research was to evaluate awareness, knowledge, and practice of diabetic retinopathy (DR) among diabetic patients in Punjab, a state with significantly higher prevalence of diabetes and diabetic retinopathy than other Indian states. Our results are important in providing an overview of the status of awareness and knowledge of DR, comparing with other studies in the region, pointing out strengths and weaknesses in diabetic care that require improvement [9].

Age distribution

The distribution of our study population by age group showed that the largest number belonged to the age range of 40-69 years, with 37.5% in the age group of 40-59 years and 36.9% in the age group of 60-69 years, respectively. This distribution is consistent with the results of Singh *et al.* and

Hussain *et al.*, who noted similar patterns of age distribution in diabetics in these age groups. The greater prevalence in middle-aged and older adults underscores the need to target these age groups in DR prevention and early detection [10, 11].

Gender distribution

Our study indicated a slightly higher distribution of females (53.8%), as compared to that of males (46.3%). This was in accordance with gender distribution noted in the study conducted by Singh *et al.* in which the female participants were also found to be higher (52.6%) than the males [10].

Family history of diabetes

Our study revealed that 52% of participants had a family history of diabetes, similar to findings in the study conducted by Singh *et al.* (47.4%). This reinforces the concept that family history is an important factor in both awareness and health behaviours related to diabetes and its complications [10].

Effect of diabetes on eyes

In our research, 58% of the participants knew that DR is a possible complication of diabetes. This is comparable to a study done by Singh *et al.* in North India, in which 58.1% of the participants were less knowledgeable about the details of DR prevention and treatment. Comparatively, Almalki *et al.* observed a higher level of awareness (79.5%) of the connection between DR and diabetes. Such disparity between the results might indicate variation in demographic composition and health care setup in different parts of the world. This indicates a need for awareness programs in more directed fashion ^[10, 6].

Knowledge of complications in control diabetes

In our study 48.8% of the respondents were aware that the patients with well-controlled blood glucose may still have eye complications. This concurs with Singh *et al.* study that reported 47.4% participants were aware of eye complications ^[10].

Frequency of eye screening

Despite the awareness noted in our study, only 51.2% of participants correctly identified the recommended frequency of 6 monthly eye check-ups. In contrast, Singh *et al.* reported that 37.5% of participants recognized the need for biannual eye checkups. This difference may reflect a stronger emphasis on educating patients about regular eye screening ^[10].

Diabetic retinopathy prevention through effective diabetes management: In terms of prevention, 58.1% of participants in our study acknowledged that good diabetic control could help prevent DR, a figure that matches Singh *et al.*'s findings (58.1%). However, this was lower than Almalki *et al.*'s study, where 78% of participants recognized the critical role of good diabetic control. This discrepancy suggests that while awareness of DR prevention is generally high, more education is needed to link diabetes management directly with eye health ^[10, 6].

Source of information

In our study, healthcare professionals were the primary source of information about DR (75.6%) followed by television/radio (18.1%) and family members/relatives (6.3%). This finding in contrast with that of Singh *et al.* study (47.4%) and was comparable to 79.5% reported by Almalki *et al.*. This study highlights the critical role that healthcare professionals play in educating patients about DR ^[10, 6].

These results suggests that while awareness is important, it alone may not be enough to drive action, emphasizing the need for better integration of DR screening into routine diabetes care.

Eye examination in past year

In our study it was found that 58.1% had an eye examination in the past year. Our findings also indicate a significant gap in eye care adherence, with 41.9% of participants not having undergone an eye examination in the past year. This was in contrast Hussain *et al.* study conducted in south India which showed only 9.6% of individuals undergoing eye examination in the past year ^[11].

Availability of diabetic retinopathy treatment

According to the results of our study 43.1% of participants were well aware that DR was treatable, while 31.9% were unsure about the treatment. This is opposed with Almalki *et al.* results, which reported 66.8% of participants recognising the treatability of DR ^[6].

Treatment approach for diabetic retinopathy

Majority of the population (36.3%) in our study believed laser as the main stay of treatment followed by surgery (33.1%) and good control of diabetes (30.6%). There was a notable gap in knowledge about specific treatments of DR. A similar pattern of distribution of diabetics in these seen in Singh *et al.* results, where participants were aware of DR treatment but lacked detailed understanding ^[10].

Conclusion

This study provides important insights into the awareness, knowledge, and practices regarding diabetic retinopathy among individuals with diabetes in Punjab, a region with a higher-than-average prevalence of diabetes and diabetic retinopathy in India. While the level of awareness is encouraging, there are significant gaps in knowledge about the specifics of DR prevention, treatment, and the recommended frequency of eye check-up. Most of the findings are consistent with the studies conducted in other regions, such as those by Singh *et al.*, Almalki *et al.*, and Hussain *et al.*, yet they also highlight the need for more targeted educational programs and enhanced healthcare interventions to bridge the gap between knowledge and practice. Given the high prevalence of diabetes in Punjab and the associated risk of DR, improving awareness, promoting regular eye screenings, and ensuring proper diabetes management are the key to preventing blindness and other complications related to diabetes.

Suggestion

A proper survey should be conducted on a larger scale across the state, by the Health Ministry in association with NGOs, and efforts must be made to spread awareness among individuals to bridge the gap between awareness and implication of the knowledge.

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