



## Original Research Article

## Awareness of diabetic retinopathy among Type 2 diabetes mellitus patients in and around Chennai

S Shobika<sup>1,\*</sup>, Sanjeev Kumar Puri<sup>1</sup><sup>1</sup>Dept. of Ophthalmology, Saveetha Medical College and Hospital, Chennai, Tamil Nadu, India

## ARTICLE INFO

## Article history:

Received 12-11-2019

Accepted 25-01-2020

Available online 16-06-2020

## Keywords:

Blindness

Awareness

Diabetes mellitus

Diabetic retinopathy

## ABSTRACT

**Objective:** To assess the level of awareness about diabetic retinopathy among Type 2 diabetes mellitus patients in and around Chennai.**Materials and Methods:** A cross sectional study was done on 150 Type-2 diabetes mellitus patients in and around Chennai between January 2019 to April 2019, to assess their level of awareness about diabetes retinopathy through a structured questionnaire.**Results:** Of 150 randomly selected Type 2 diabetes mellitus patients, 93 (62%) were women and 57 (38%) were males. 32% of them were illiterates, 31.33% had only primary education and 36.67% had education above middle school. 64.67% of the selected patients wore glasses for refractive error and they were aged from 15yrs to 80yrs. Nearly 3/4<sup>th</sup> of this urban population are aware about diabetic retinopathy and feel blood glucose control and regular eye check-ups are necessary in reducing the risk of diabetic retinopathy, less than 1/4<sup>th</sup> know about blindness caused by DR, that laser treatment does not improve the vision but only reduces further deterioration and when a diabetic patient should first visit the eye doctor- therein suggestive that most are aware of the disease but are not well informed about the complications and treatment of the disease.© 2020 Published by Innovative Publication. This is an open access article under the CC BY-NC license (<https://creativecommons.org/licenses/by-nc/4.0/>)

## 1. Introduction

Diabetes mellitus (DM) is a metabolic disease characterized by alteration in carbohydrate, lipid and protein metabolism, where the body cannot regulate the amount of glucose in the blood.<sup>1,2</sup> DM can result in many complications such as nephropathy, cardiovascular, neurologic and ocular complications with diabetic retinopathy (DR) being the most common micro vascular ocular complication of DM. DR is defined as a disorder of the retinal circulation that compromises the delivery of oxygen and nutrients to the retina, thus being unable to meet the requirements of its high metabolic demands. Therefore, defects in retinal circulation may affect normal vision, which is considered a leading cause of vision impairment and blindness worldwide. India is set to emerge as the diabetic capital of the world. It is suggested to occur in approximately 77% of diabetics within

10 years of diabetes onset, and almost in 100% of diabetics after 30 years of diabetes. Therefore, the longer a person has diabetes, the higher his or her chances of developing diabetic retinopathy.<sup>3</sup>

According to the WHO, 31.7 million people were affected by diabetes mellitus (DM) in India in the year 2000. This figure is estimated to rise to 79.4 million by 2030, the largest number in any nation in the world.<sup>4,5</sup> Almost two-third of all Type 2 and almost all Type 1 diabetics are expected to develop diabetic retinopathy (DR) over a period of time. Many risk factors for DR have been reported among patients with diabetes; these include uncontrolled DM, longer periods of DM and the presence of other systemic diseases such as hypertension. Increasing the level of awareness of DR as an ocular complication of DM among patients with diabetes is considered an important factor for early diagnosis and management of DR, in addition to the prevention of possible visual impairment due to the disease.<sup>6</sup> In view of the alarming increase in the incidence

\* Corresponding author.

E-mail address: [vasanthysridhar@gmail.com](mailto:vasanthysridhar@gmail.com) (S. Shobika).

of DM in India, this study was conducted to assess the awareness levels of DR, compliance with DM control and routine eye check-up among Type 2 DM patients in and around Chennai.

The aim of this study is to evaluate the awareness of diabetic retinopathy among Type 2 diabetes mellitus patients in and around Chennai.

## 2. Materials and Methods

### 2.1. Study design

This cross-sectional study was conducted between January 2019 and April 2019. Participants were asked to answer questions from a structured questionnaire developed in English and Tamil, which included questions about awareness of DR due to DM and compliance with DM and DR management.

### 2.2. Study area

All interviewed patients were with Type 2 DM and were randomly selected using multistage random cluster sampling from the general population in and around Chennai.

### 2.3. Sample size

150 study subjects having Type 2 diabetes mellitus were selected.

The content validity of the questionnaire was assessed by a panel of specialised Ophthalmologists from Saveetha Medical College Hospital, Thandalam, Chennai and Prior to the study, for the assessment of the reliability of the questionnaire, a random sample of 20 patients with diabetes was recruited to complete the questionnaire and the obtained Cronbach's alpha value was 0.8. Based on the preliminary results which showed a redundancy in some questions, the questionnaire was amended and these results were disregarded in the final data analysis.

### 2.4. Inclusion criteria

Patients with Type 2 diabetes mellitus who had normal cognitive ability and could speak Tamil and resided in and around Chennai was selected.

### 2.5. Exclusion criteria

All non-diabetic patients and any patient with other type of Diabetes.

### 2.6. Data collection

The Questionnaire had two sections:

One was the basic sociodemographic information that included age, gender, educational level, whether they wear

glasses or not and address. The second section was to assess the knowledge about diabetes, DR and source(s) of knowledge; patient's compliance with DM control, treatment and routine eye check-up visits. A sample of the questions related to this section is given below:

1. Are you aware that Diabetes Mellitus can affect the retina of your eyes and cause a condition called Diabetic Retinopathy?
2. Are you aware that diabetic retinopathy can lead to blindness?
3. Do you think regular eye check-ups are required in diabetic patients?
4. Do you think maintenance of blood sugar levels can reduce the risk of diabetic retinopathy?
5. How frequently do you think you should undergo eye check-ups?
6. How frequently do you check your blood glucose levels?
7. What are your sources of information about diabetes mellitus and diabetic retinopathy?
8. Do you know that laser treatment for diabetic retinopathy does not improve vision but reduces further deterioration in vision?
9. Do you think diabetic retinopathy can be prevented?
10. When do you feel that a diabetic should first see an eye doctor?

Informed consent was obtained from all individual participants included in the study prior to their participation in the study.

## 3. Data analysis

Numbers and percentages were calculated to summarize categorical and nominal data. According to assigned key, awareness present or absent is calculated.

## 4. Observation and Result

Of 150 randomly selected Type 2 diabetes mellitus patients, 93 (62%) were women and 57 (38%) were males. 32% of them were illiterates, 31.33% had only primary education and 36.67% had education above middle school. 64.67% of the selected patients wore glasses for refractive error and they were aged from 15yrs to 80yrs.

78.67% of these people had awareness about diabetes mellitus causing a condition called diabetic retinopathy. But only 36% knew that Diabetic Retinopathy can cause blindness. 86.67% of them are aware that Diabetic retinopathy can be prevented. Only 15.33% are aware that laser treatment for DR does not improve vision but reduces further deterioration in vision.

79.33% feel regular eye check-ups are required in DM patients and nearly 80% patients are fairly frequent with their eye check-up.

**Table 1:**

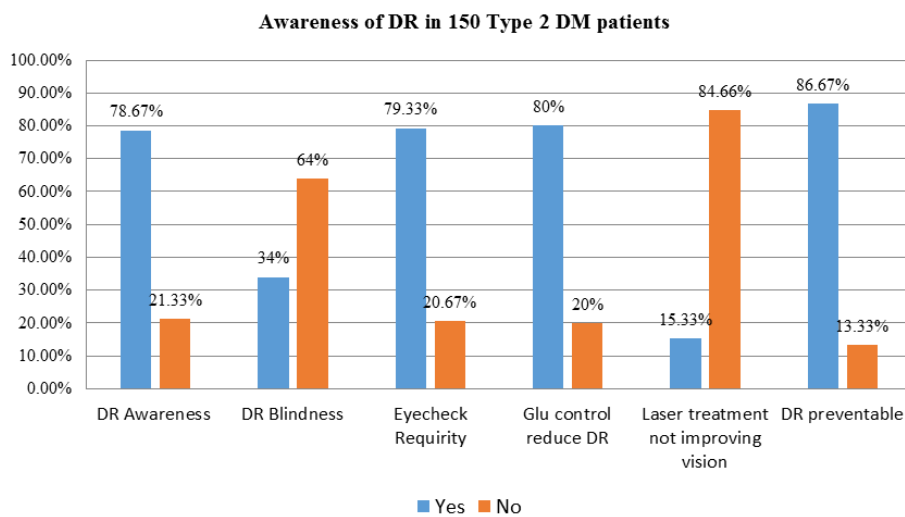
Question	Yes (Aware)	No (Not aware)
1. Are you aware that diabetes mellitus can affect the retina of your eyes and cause a condition called diabetic retinopathy?	78.67%	21.33%
2. Are you aware that diabetic retinopathy can lead to blindness?	36%	64%
3. Do you think regular eye check-ups are required in Diabetic patients?	79.33%	20.67%
4. Do you think maintenance of blood sugar levels can reduce the risk of diabetic retinopathy?	80%	20%
5. How frequently do you think you should undergo eye check-ups?	a. 33.33% b. 36% c. 10%	20.67%
6. How frequently do you check your blood glucose levels?	a. 3.33% b. 4% c. 64%	28.67%
7. What are your sources of information about diabetes mellitus and diabetic retinopathy?	a. 0% b. 0% c. 82.67% d. 14%	3.33%
8. Do you know that laser treatment for diabetic retinopathy does not improve vision but reduces further deterioration in vision?	15.33%	84.66%
9. Do you think diabetic retinopathy can be prevented?	86.67%	3.33%
10. When do you feel that a diabetic should first see an eye doctor?	5.36%	6.67% 13.33% 40.67% 3.33%

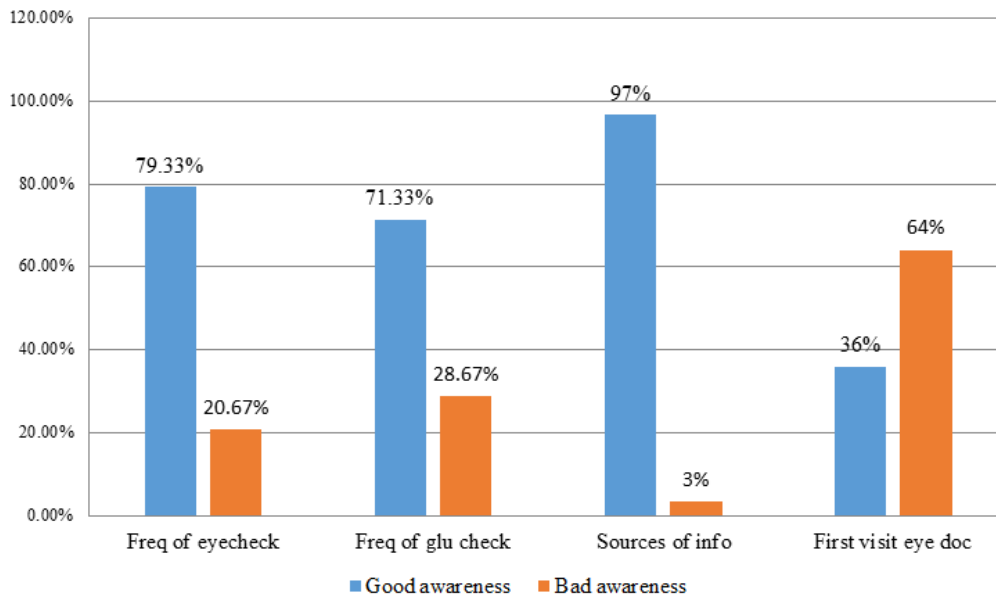
Key:-

Question 6: 1) Everyday 2) Weekly 3) Monthly 4) Not Regularly

Question 7: 1) Internet 2) Magazines 3) Doctor 4) Friends and Relatives 5) I do not get any information.

Question 10: 1)Not necessary 2)When they need glasses 3)Only if they are referred 4) When their vision goes bad 5)At the time of diagnosis.

**Fig. 1:** Awareness of DR in 150 Type 2 DM patients



**Fig. 2:** Awareness about association of compliance with treatment and checkup with development of disease

80% of people are aware that maintenance of blood sugar levels can reduce the risk of diabetic retinopathy and 71.33% check their blood sugar levels regularly while 28.67% are irregular with blood glucose checking.

96.67% of the patients have a source of information about diabetes mellitus and diabetic retinopathy with only 3.33% answered they do not received any information.

Only 36% of people are aware that a diabetic patient should first see an eye doctor at the time of diagnosis.

Based on this data, while nearly 3/4<sup>th</sup> of this urban population are aware about Diabetic Retinopathy and feel blood glucose control and regular eye check-ups are necessary in reducing the risk of Diabetic Retinopathy, less than 1/4<sup>th</sup> know about blindness caused by DR, that laser treatment does not improve the vision but only reduces further deterioration and when a Diabetic patient should first visit the eye doctor- therein suggestive that most are aware of the disease but are not well informed about the complications and treatment of the disease.

## 5. Discussion

It is well known that awareness is a vitally important step in the creation of a successful program to battle against any disease in the community. This is especially true of the growing problem of diabetic retinopathy. Many studies have revealed that Diabetic Retinopathy, despite its status as one of the greatest causes of blindness in both developed and developing countries, is virtually unknown to a large majority of the population. The lack of awareness about DR is considered a major health problem that could interfere with proper management and prevention of possible visual

impairment.

According to a study,<sup>7</sup> the age- and gender-adjusted prevalence rate of diabetes in an urban Chennai population was 28.2%, and the prevalence of diabetic retinopathy in general population was 3.5%. The prevalence of diabetic retinopathy in the population with diabetes mellitus was 18.0%

From the study we conducted, it can be concluded that a high level of awareness among more than 3/4<sup>ths</sup> of the population about diabetic retinopathy is present but only 1/4<sup>th</sup> are aware about its complications and treatment and management of DM to prevent DR. Despite the high level of awareness about DR in the study, the level of patients' compliance with check-ups and efforts to reduce risk of DR is low.<sup>4</sup> This discrepancy between the levels of awareness and compliance in terms of routine eye examination seems to be common among patients with diabetes in the world, coinciding with reports stating that only half of the patients in Myanmar<sup>8</sup> and two-thirds of Japanese patients attended a routine eye examination.

Poorly controlled diabetes raises the likelihood of complications like DR. This higher proportion of diabetics with poorly controlled diabetes may be attributed to lack of awareness and limited eye health care facilities. Information given to diabetic patients should not just be on the nature of ocular complications of diabetes, but also on the risk factors for these complications and how to prevent them. Proper education also plays a major role.

The main source of information about DR in our sample was doctors, followed by friends and relatives and almost negligible from mass media which suggests awareness through mass media such as newspapers or advertisements

should be encouraged so that even people who don't have access to Internet get notified and become more aware.

The reason given by patients for not getting an early DR screening was mainly a lack of information about DR, lack of time and will to take the examination and a fear of discovering any eye diseases which may burden the financial status of their families. This finding warrants further investigation into how to encourage patients with diabetes to routinely comply with vision examinations and retinal assessments every 12 months, as recommended by the international guidelines.

DR complications become more severe with prolonged duration of diabetes, it is imperative that spreading awareness on DR should be adopted by the practitioners at early stages of DM. Furthermore, public health awareness campaigns need to follow well-planned strategies. As part of the community may not be able to pursue higher education, school programs need to be revised to increase awareness of non-communicable diseases such as DM and also awareness programmes about DM and DR and eye camps has to be conducted even in remote places by medical personnel and students.

## 6. Conclusion

The conclusion of this study done on 150 Type 2 diabetic patients is that while nearly 3/4<sup>th</sup> of this urban population are aware about diabetic retinopathy and feel blood glucose control and regular eye check-ups are necessary in reducing the risk of diabetic retinopathy, less than 1/4<sup>th</sup> know about blindness caused by DR, that laser treatment does not improve the vision but only reduces further deterioration and when a Diabetic patient should first visit the eye doctor- therein suggestive that most are aware of the disease but are not well informed about the complications and treatment of the disease.

There is a need to implement strategies to increase the awareness of DR and the importance of early retinal screening among affected patients, in order to reduce the risk of visual complications. Additionally, screening programs for DR should not be exclusive to eye care centres but access to these should be increased by eye camps and

awareness programmes set up near places of residence even in remote areas.

## 7. Source of Funding

None.

## 8. Conflict of Interest

None.

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## Author biography

S Shobika MBBS IIIrd Year

Sanjeev Kumar Puri HOD

**Cite this article:** Shobika S, Puri SK. Awareness of diabetic retinopathy among Type 2 diabetes mellitus patients in and around Chennai. *Indian J Clin Exp Ophthalmol* 2020;6(2):165-169.