

## Original research article

**Awareness of Diabetic Patients in a Tertiary Care Hospital about their Awareness and Understanding about Diabetic Retinopathy****Dr. Nishit Kumar Jha<sup>1</sup>, Dr. M.M. Jamal<sup>2</sup>****<sup>1</sup>Senior Resident, Department of Ophthalmology, M.G.M. Medical College and Hospital, Jamshedpur, Jharkhand, Bihar, India****<sup>2</sup>Professor & Head, Department of Ophthalmology, M.G.M. Medical College and Hospital, Jamshedpur, Jharkhand, Bihar, India****Corresponding Author: Dr. Nishit Kumar Jha****Abstract**

**Aim:** Awareness of diabetic retinopathy among Type 2 diabetes mellitus patients in Bihar region.

**Methods:** This was a descriptive, cross sectional, non-randomized, questionnaire based study conducted in the Department of Ophthalmology, M.G.M. Medical college & Hospital, Jamshedpur, Jharkhand, India for 1 year, after taking the approval of the protocol review committee and institutional ethics committee. Participants were asked to answer questions from a structured questionnaire developed in English and Hindi, which included questions about awareness of DR due to DM and compliance with DM and DR management. All interviewed patients were with Type 2 DM and were randomly selected using multistage random cluster sampling from the general population in and around Bihar. 100 study subjects having Type 2 diabetes mellitus were selected. 100 Patients with Type 2 diabetes mellitus who had normal cognitive ability and could speak hindi and resided in and around Bihar was selected.

**Result:** Of 100 randomly selected Type 2 diabetes mellitus patients, 55(55%) were women and 45 (45%) were males. 32% of them were illiterates, 29% had only primary education and 39% had education above middle school. 80% of these people had awareness about diabetes mellitus causing a condition called diabetic retinopathy. But only 34% knew that Diabetic Retinopathy can cause blindness. 88% of them are aware that Diabetic retinopathy can be prevented. Only 13% are aware that laser treatment for DR does not improve vision but reduces further deterioration in vision. 80% feel regular eye check-ups are required in DM patients and nearly 80% patients are fairly frequent with their eye check-up. 82% of people are aware that maintenance of blood sugar levels can reduce the risk of diabetic retinopathy and 71% check their blood sugar levels regularly while 29% are irregular with blood glucose checking. 95% of the patients have a source of information about diabetes mellitus and diabetic retinopathy with only 5% answered they do not received any information. Only 35% of people are aware that a diabetic patient should first see an eye doctor at the time of diagnosis.

**Conclusion:** 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.

**Keywords:** diabetic retinopathy, diabetes mellitus, awareness

## Introduction

Diabetes mellitus (DM) can lead to microvascular complications such as retinopathy, nephropathy, and peripheral neuropathy, in addition to macrovascular complications that include cardiovascular disease, cerebrovascular disease, and peripheral vascular disease.<sup>1</sup> DM has caused 5 million deaths in 2015. The prevalence of DM is increasing worldwide. It is estimated that by 2030 there would be rise in people with DM to nearly 552 million.<sup>2</sup> It is predicted that in developing countries, there will be a humongous rise in DM patients, as the majority of their patient population is aged between 45 and 64 years.<sup>3</sup> DM can result in many complications such as nephropathy, cardiovascular, neurologic and ocular complications,<sup>4</sup> with diabetic retinopathy (DR) being the most common micro vascular ocular complication of DM.<sup>5</sup> 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.<sup>6</sup> Therefore, defects in retinal circulation may affect normal vision, which is considered a leading cause of vision impairment and blindness worldwide.<sup>1,4,7</sup> Wisconsin Epidemiological study has proved that micro vascular complications such as diabetic retinopathy are linked to duration of diabetes.<sup>8</sup> Routine dilated fundus examination is recommended at the time of diagnosis of diabetes and then yearly review is required in all patients having type 2 diabetes mellitus. Awareness of importance of routine check-up for the screening of diabetic retinopathy is poor even in developed countries and the situation is much worse in a developing country like India. Previous studies have shown that 63% of the rural diabetic population has not had an eye examination.<sup>9</sup> Magnitude of blindness caused by diabetic retinopathy is increasing. Lack of awareness about diabetic retinopathy and the preventable complications associated with it worsens the situation. Early detection of diabetic retinopathy and its appropriate management is very important to prevent irreversible visual loss. This can only be achieved with better knowledge and awareness among patients. There have been many studies done in other states in India to assess the knowledge and awareness on diabetes and diabetic retinopathy among patients with diabetic retinopathy, however very few studies assessed knowledge, awareness and practices amongst patients with diabetic retinopathy.<sup>10</sup>

## Material and Methods

This was a descriptive, cross sectional, non-randomized, questionnaire based study Department of Ophthalmology, M.G.M. Medical college & Hospital, Jamshedpur, Jharkhand, India for 1 year after taking the approval of the protocol review committee and institutional ethics committee.

## Methodology

Participants were asked to answer questions from a structured questionnaire developed in English and hindi, which included questions about awareness of DR due to DM and compliance with DM and DR management.

All interviewed patients were with Type 2 DM and were randomly selected using multistage random cluster sampling from the general population in and around bihar. 100 study subjects having Type 2 diabetes mellitus were selected.

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.

**Inclusion criteria**

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

**Exclusion criteria**

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

**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.

**Data analysis**

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

**Result**

Of 100 randomly selected Type 2 diabetes mellitus patients, 55(55%) were women and 45 (45%) were males. 32% of them were illiterates, 29% had only primary education and 39% had education above middle school. 65% of the selected patients wore glasses for refractive error and they were aged from 18 yrs to 75 yrs.

**Table 1: Demographic characteristics of the study population**

Age	Number	Percentage
Below 30	10	10
30-40	23	23
40-50	33	33
50-60	21	21
Above 60	13	13
<b>Gender</b>		
Male	45	45
Female	55	55
<b>Educational status</b>		

Uneducated	32	32
class 1-12	29	29
college level	39	39
<b>Socio economic status</b>		
Lower	57	57
Middle	27	27
Upper	16	16

80% of these people had awareness about diabetes mellitus causing a condition called diabetic retinopathy. But only 34% knew that Diabetic Retinopathy can cause blindness. 88% of them are aware that Diabetic retinopathy can be prevented. Only 13% are aware that laser treatment for DR does not improve vision but reduces further deterioration in vision.

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

**Table 2: Frequency of the responses**

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?	80%	20%
2. Are you aware that diabetic retinopathy can lead to blindness?	34%	66%
3. Do you think regular eye check-ups are required in Diabetic patients?	80%	20%
4. Do you think maintenance of blood sugar levels can reduce the risk of diabetic retinopathy?	82%	18%
5. How frequently do you think you should undergo eye check-ups?	80%	20%
6. How frequently do you check your blood glucose levels?	a. 4% b. 4% c. 63%	29%
7. What are your sources of information about diabetes mellitus and diabetic retinopathy?	a. 0% b. 0% c. 82% d. 13%	5%
8. Do you know that laser treatment for diabetic retinopathy does not improve vision but reduces further deterioration in vision?	13%	88%
9. Do you think diabetic retinopathy can be prevented?	88%	12%
10. Are you aware that diabetic patient should first see an eye doctor at the time of diagnosis	35%	65%

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

Question 7: 1) Internet 2) Magazines 3) Doctor 4) Friends and Relatives.

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

82% of people are aware that maintenance of blood sugar levels can reduce the risk of diabetic retinopathy and 71% check their blood sugar levels regularly while 29% are irregular with blood glucose checking.

95% of the patients have a source of information about diabetes mellitus and diabetic retinopathy with only 5% answered they do not received any information.

Only 35% 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  $3/4^{th}$  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  $1/4^{th}$  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.

### Discussion

The lack of awareness about diabetic retinopathy in diabetic patients is considered as a major cause of diabetic blindness in our community. The main objective of this study was to ascertain the awareness level and the practice patterns adopted by diabetic patients in the community.

Diabetic retinopathy is an upcoming cause of visual impairment and prevalence of diabetic retinopathy is more in developing countries. The facilities in primary health centres which are provided free of cost are not utilized properly and this is reflected in the results of our study.

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.

Of 100 randomly selected Type 2 diabetes mellitus patients, 55(55%) were women and 45 (45%) were males. 32% of them were illiterates, 29% had only primary education and 39% had education above middle school. 65% of the selected patients wore glasses for refractive error and they were aged from 18 yrs to 75 yrs. similar to another study.<sup>11</sup>

From the study we conducted, it can be concluded that a high level of awareness among more than  $3/4^{th}$ s of the population about diabetic retinopathy is present but only  $1/4^{th}$  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>12</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>13</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.

### Conclusion

The conclusion of this study done on 100 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.

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