

Awareness of diabetic retinopathy and barriers for eye screening among adults with type 2 diabetes mellitus attending tertiary care teaching hospital, Davanagere, Karnataka

Manu A S, Shubha Bakkappa Davalgi, Swathi S Aithal, Babu Dilip

Department of Community Medicine, JJM Medical College, Davanagere, Karnataka, India

Correspondence to: Swathi S Aithal, E-mail: aithal.swathi@gmail.com

Received: May 01, 2018; Accepted: May 17, 2018

ABSTRACT

Background: India is currently being considered the diabetic capital of the world. With the huge burden of diabetes, more emphasis has to be laid about the disease and its complications. Diabetic retinopathy, one of the major complications of diabetes mellitus, is the leading cause of blindness and visual impairment. With the help of eye screening and timely treatment, the damage caused due to diabetes mellitus can be delayed. **Objectives:** The objective of this study is to know the awareness of diabetic retinopathy and barriers for eye screening among adults with type 2 diabetes mellitus. **Materials and Methods:** Facility-based cross-sectional study was conducted in tertiary care hospital of Davanagere district, Karnataka, during September 1–October 31, 2017. A total of 150 patients with a history of type 2 diabetes mellitus were interviewed using pre-tested semi-structured questionnaire. Data were entered in Epidata 3.1 software, and statistical analysis was done by SPSS software version 16. Descriptive statistics and Chi-square test were applied. **Results:** In this study, 88 (58.7%) patients were aware that diabetes can affect the eye. About 105 (70%) patients felt that with controlled diabetes, they need not undergo eye screening and felt that they need to go for eye checkup only when vision is affected. Majority of 135 (90%) patients were not aware of treatment options for diabetic retinopathy. The most common source about diabetic complication was from health-care providers, and lack of knowledge 141 (93.3%) about the importance of eye screening was the major barrier for eye screening. **Conclusion:** Even though more than half of the patients were aware about diabetes affecting eye, lesser patients were aware about treatment and eye screening. This emphasizes the need for increasing awareness about disease, its complications, and treatment options. Patients should be also motivated for eye screening.

KEY WORDS: Awareness; Diabetes Mellitus; Diabetic Retinopathy

INTRODUCTION

Diabetes mellitus is a chronic disease which is becoming increasingly common in the developing countries. In 2015,

there were 415 million people with diabetes living in the world. By 2040, this number is expected to increase to 642 million. With an overall global prevalence of 34.6%, diabetic retinopathy as such accounts for 4.8% of the cases of blindness throughout the world.^[1]

There were 69.2 million people in India living with diabetes as per the 2015 data. Over the past 20 years, diabetes mellitus has emerged as a common cause of ocular morbidity and blindness, becoming number 6 (2001–2002 survey report) from 17 (1986–1989 survey report) among the list of causes for blindness in India as per the WHO-NPCB surveys.^[2]

Access this article online	
Website: http://www.ijmsph.com	Quick Response code 
DOI: 10.5455/ijmsph.2018.0514717052018	

International Journal of Medical Science and Public Health Online 2018. © 2018 Manu A S. This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), allowing third parties to copy and redistribute the material in any medium or format and to remix, transform, and build upon the material for any purpose, even commercially, provided the original work is properly cited and states its license.

Diabetic retinopathy is a leading cause of blindness and visual disability. Findings, consistent from various studies, suggest that, after 15 years of diabetes, approximately 2% of people become blind, while about 10% develop severe visual handicap. It has also been seen that loss of vision due to certain types of glaucoma and cataract may be more common in people with diabetes mellitus than in those without the disease.^[3]

The major risk factors for developing diabetic retinopathy are the duration of diabetes^[4,5] and severity of hyperglycemia.^[5,6] It has been observed that visual loss or impairment due to diabetic retinopathy can be delayed by early detection, prompt treatment, and timely intervention by laser photocoagulation.^[2]

Diabetic retinopathy is difficult to diagnose in its early stages as it is asymptomatic, and hence, screening is the only way to identify such patients to prevent them from going blind. According to guidelines for diabetic eye care in India, in case of diabetic patients with no apparent diabetic retinopathy or mild non-proliferative diabetic retinopathy, repeat eye examination is recommended after 1 year, and in patients whom moderate non-proliferative diabetic retinopathy is diagnosed, repeat eye examination is recommended within 6–12 months.^[7]

According to the NFHS-4^[8] data of Davangere district, the prevalence of high blood sugar (>140 mg/dl) was 6.5% in women and 13.2% in men. As this is one of the major risk factors for diabetic retinopathy, it is important to know how many are aware about blood sugar control and complications due to uncontrolled blood sugars.

Considering the above facts and limited studies, it was important to know the awareness of diabetes complications, especially diabetic retinopathy, and also barriers preventing eye screening among diabetic patients in our tertiary care teaching hospital.

MATERIALS AND METHODS

Study Participants

A facility-based cross-sectional study was conducted in tertiary care teaching hospital in Davanagere district, Karnataka, for 2 months, i.e., September 1–October 31, 2017. This hospital not only caters to the local population but is also a referral hospital for neighboring taluks. Ethical approval for the study was obtained from the institutional review board.

All the patients diagnosed with diabetes mellitus type 2 who visited the hospital outpatient department during the study period and gave consent were a part of the study. Patients with a history of prior intervention for diabetic retinopathy such as laser therapy and surgical intervention were excluded from the study.

After obtaining written informed consent from the patients, they were interviewed with the help of pre-tested semi-structured questionnaire.

The questionnaire comprised basic demographic data of patients such as age, sex, education, and income. Information was collected under the variables such as duration of diabetes, control of diabetes, and associated hypertension. There were also specific questions regarding awareness of diabetes control, diabetes complications, treatment options available for retinopathy, and barriers for undergoing eye screening.

Statistics

Data were entered serially in Epidata 3.1 software and were analyzed using SPSS software version 16. Descriptive statistics and Chi-square test were applied wherever necessary. $P < 0.05$ was considered as statistically significant. Results were expressed in the form of text, figure, and tables.

RESULTS

A total of 150 patients were included in the study. Of the enrolled patients, the mean age of participants was 56.41 ± 10.56 years. Of the total participants, 78 (52%) were females; majority 77 (51.3%) of them were illiterate and belonged to socioeconomic status class V 88 (58.7%), according to modified B J Prasad classification 2017 [Table 1].

Among the study participants, 78 (52%) were suffering from diabetes for a duration of <5 years. In 83 (55.3%), hypertension was a comorbidity and diabetic retinopathy was diagnosed only in 7 (4.7%) patients [Table 2].

Among the enrolled participants, more than half of the patients 88 (58.7%) believed that diabetes could affect their eyes. Among them, only 25 (16.7%) patients felt that individuals with well-controlled blood sugar levels have eye problems and 45 (30%) felt that there is a need for eye checkup even if it is well controlled. When asked about frequency of eye checkup, majority 106 (70.67%) felt that they should go only when vision is affected. About 135 (90%) did not know about treatment available for diabetic retinopathy, and doctor's referral was cited as the main reason 141 (94%) to undergo eye screening. Self-awareness about diabetic retinopathy screening was very low (6%) [Table 3].

The most common source of information about complications of diabetes mellitus was health-care provider - doctor/nurse/ophthalmologist/optometrist [Table 4].

There was no statistical association between gender of the participants, duration of diabetes mellitus, and awareness about diabetic eye disease [Table 5].

Table 1: Distribution of study participants depending on demographic characteristics (*n*=150)

Characteristics	Frequency (%)
Age (years)	
≤40	12 (8.0)
41–50	37 (24.7)
51–60	50 (33.3)
>60	51 (34.0)
Gender	
Female	78 (52.0)
Male	72 (48.0)
Education	
Illiterate	77 (51.3)
Primary	21 (14.0)
Secondary	32 (21.3)
Intermediate	14 (9.3)
Graduate	5 (3.3)
Postgraduate	1 (0.6)
Socioeconomic status	
Class 1	0 (0)
Class 2	0 (0)
Class 3	6 (4)
Class 4	56 (37.3)
Class 5	88 (58.7)

Table 2: Duration of diabetes concomitant hypertension and diabetic retinopathy among study participants (*n*=150)

Characteristics	Frequency (%)
Duration of diabetes mellitus (years)	
<5	78 (52.0)
5–10	47 (31.3)
>10	25 (16.7)
Hypertension	
Absent	67 (44.7)
Present	83 (55.3)
Diabetic retinopathy	
Absent	143 (95.3)
Present	7 (4.7)

It was seen that lack of knowledge about the importance of eye screening 141 (94%) was the most common barrier preventing the participants undergoing eye screening [Figure 1].

DISCUSSION

In the present study, even though more than half of the patients, 88 (58.7%), were seen to be aware that diabetes can affect the eye, majority of them, 105 (70%), said that with controlled diabetes, they need not undergo eye screening and also felt the need to go for eye checkup only when vision is

Table 3: Awareness about diabetes retinopathy among study participants (*n*=150)

Characteristics	Frequency (%)
Are you aware that diabetes can affect the eye	
Yes	88 (58.7)
No	62 (41.3)
How good do you think your blood sugar control is?	
Good	114 (76.0)
Not good	36 (24.0)
Can individuals with controlled diabetes have eye problems?	
Yes	25 (16.7)
No	125 (83.3)
Does a diabetic patient need to have eye checkup when his/her blood sugar level is well controlled?	
Yes	45 (30.0)
No	105 (70.0)
Does a diabetic patient need to have eye checkup when his/her blood sugar level is poorly controlled?	
Yes	79 (52.7)
No	71 (47.3)
Does diabetes cause eye complications?	
Yes	87 (58)
No	63 (42)
How frequently should a person with diabetes undergo an eye checkup?	
Every 6 months	30 (20.0)
Yearly	11 (7.3)
Two yearly	3 (2.0)
Only when vision is affected	106 (70.7)
Do you know what are the treatments available for diabetic retinopathy are?	
Good control of diabetes mellitus alone is adequate	6 (4.0)
Laser treatments	4 (2.7)
Surgery	5 (3.3)
Do not know	135 (90.0)
What are the reasons that make you undergo first eye screening?	
Doctor's referral	141 (94.0)
Self-awareness	9 (6.0)

affected. The awareness about treatment options available for diabetic retinopathy was low 15 (10%), and lack of knowledge about the importance of eye screening was the major barrier.

In this study, more than half of the patients, 58.7%, were aware that diabetes can affect the eye which is higher as compared to studies done in Bagalkot^[2] where 45.7% were aware and 37.1% were aware in the study done in Tamil Nadu.^[9] This

awareness was low as compared to studies done in Vellore (71.9%)^[1], Nepal (63.3%)^[10] and Jordan (98.3%)^[11]

Majority of the patients 83.3% believed that individuals with controlled diabetes will have no eye problem which is higher as compared to the findings done in Bagalkot (68%)^[2] and Malaysia (51.1%)^[12]

Only 52.7% of patients felt the need for eye checkup when his/her diabetes was uncontrolled. Nevertheless, smaller proportions of patients (30%) were under the correct impression that eye checkups are still necessary in spite of well-controlled diabetes mellitus. This was low when compared to studies done in Bagalkot (76.6%)^[2] and Malaysia (91.2%)^[12] wherein most of them felt the need for eye checkup

Table 4: Source of information about eye complications of diabetes mellitus among study participants* (n=87)

Source of information	Frequency (%)
Doctor/nurse/ophthalmologist/optometrist	76 (87.35)
Family member/friends/relatives with diabetes	36 (41.37)
Television/radio/newspaper/internet	20 (22.98)

*Multiple responses

Table 5: Association between sex and duration of diabetes mellitus with awareness about diabetic eye disease among study participants

Characteristics	Aware	Not aware	P value
Sex			
Female	43	35	0.360
Male	45	27	
Duration of diabetes mellitus (years)			
<5	49	29	0.261
5-10	23	24	
>10	16	9	

when his/her diabetes was uncontrolled and only 23.3% felt the need for eye checkup even with controlled diabetes as per study done in Bagalkot,^[2] whereas 67.2% as per Malaysia study.^[12]

More than half of the patients were aware about various complications arising from uncontrolled diabetes mellitus, and similar findings were seen in the study done in Bagalkot^[2] and the most common source of knowledge about complications was medical personnel similar to studies done in Bagalkot,^[2] Nepal,^[10] and Jordan.^[11]

In the present study, when patients were asked about frequency of regular eye checkup, 70.7% felt that they need to go for it only when vision is affected which is in contrast to the findings of a study done in Bagalkot^[2] and Malaysia^[12] where it was 38% and 21.9%, respectively. Similar findings (77.2%) were seen in a study done in Kerala.^[13]

Awareness about treatment options for diabetic retinopathy was extremely low as 90% did not know about it. These findings were comparable with the studies done in Bagalkot (74.7%)^[2] and Malaysia (72.3%)^[12] and a study done in Tamil Nadu^[9] showed better knowledge about treatment options available as there were only 22.5% who did not know about it.

The most common barrier for undergoing eye screening was the lack of knowledge about the importance of eye screening followed by lack of access to eye care and time limitations. Similar reasons were given by patients in studies done in Vellore^[1] and Jordan.^[11]

As no similar studies were previously done in our setting, this provides information toward an understanding of health seeking behavior of diabetics regarding one of the major causes of blindness in this populace. We were able to interview both urban and rural population as the study

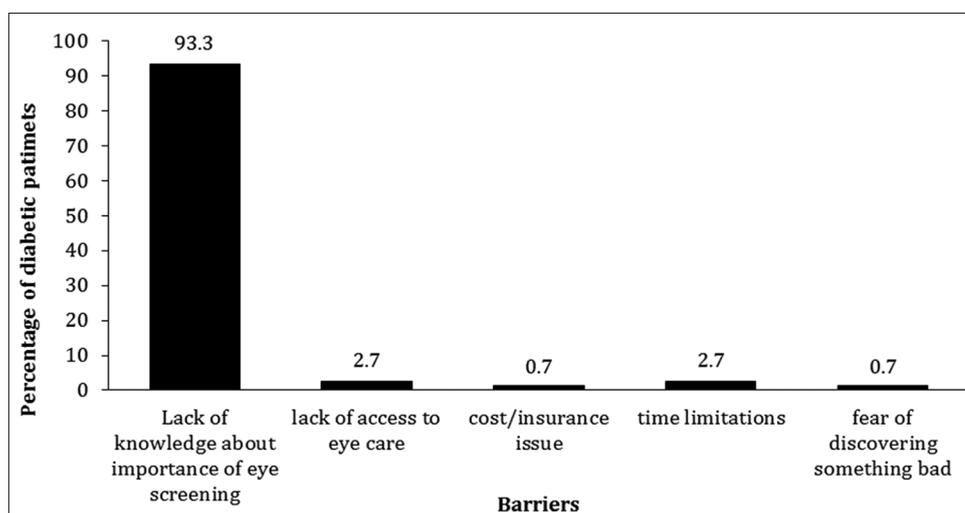


Figure 1: Barriers preventing diabetic patients from undergoing eye screening

was conducted in a tertiary care teaching hospital, whereas limitations were time constraints and the study setting as it was a facility-based study.

This emphasizes the need to adopt strategies for health education about the disease and complication to be implemented at primary, secondary, and tertiary levels of health care. The emphasis of creating awareness about diabetes mellitus control and complications is to be laid not only among diabetic patients but also among the family members of the patients as they can motivate the patients about it and also help in early care seeking.

Our study highlights the most common barrier being the lack of knowledge about the importance of undergoing eye screening, so awareness needs to be spread among the patients about periodic eye checkup as this a potentially serious complication and also treating physician should motivate the patients to undergo screening for retinopathy. Thus, contact with adults with diabetes mellitus could be utilized for stressing the importance eye screening.

The most common source about diabetic complication was from medical personnel, and hence, other methods such as mass media, pamphlets, posters, and diabetic retinopathy screening camps on public health important days like world diabetes day and world sight day could be used to increase awareness about diabetic retinopathy easily and reach out to large population.

CONCLUSION

Even though more than half of the patients were aware about diabetes affecting eye, lesser patients were aware about treatment and eye screening. This emphasizes the need for increasing awareness about disease, its complications, and treatment options. Patients should be also motivated for eye screening.

REFERENCES

1. Srinivasan NK, John D, Rebekah G, Kujur ES, Paul P, John SS, *et al.* Diabetes and diabetic retinopathy: Knowledge, attitude, practice (KAP) among diabetic patients in A tertiary eye care Centre. *J Clin Diagn Res* 2017;11:NC01-NC07.
2. Shetgar AC, Patil B, Salagar MC, Nanditha A. Assessment of awareness of diabetic retinopathy among diabetics: A clinical survey. *Indian J Clin Exp Ophthalmol* 2015;1:260-3.
3. WHO Factsheets. Diabetes Mellitus 2017. Available from: <http://www.who.int/mediacentre/factsheets/fs138/en/>. [Last cited on 2017 Nov 02].
4. Leske MC, Wu SY, Nemesure B, Hennis A, Barbados Eye Studies Group. Causes of visual loss and their risk factors: An incidence summary from the Barbados eye studies. *Rev Panam Salud Publica* 2010;27:259-67.
5. Elshafei M, Gamra H, Khandekar R, Al Hashimi M, Pai A, Ahmed MF, *et al.* Prevalence and determinants of diabetic retinopathy among persons ≥ 40 years of age with diabetes in qatar: A community-based survey. *Eur J Ophthalmol* 2011;21:39-47.
6. Diabetes Control and Complications Trial Research Group. The relationship of glycemic exposure (HbA1c) to the risk of development and progression of retinopathy in the diabetes control and complications trial. *Diabetes* 1995;44:968-83.
7. Guidelines for Diabetic Eye Care in India. New Delhi: Vision 2020: The Right To Sight-India; 2015. Available from: https://www.iapb.org/wp-content/uploads/ICO-Guidelines-for-Diabetic-Eye-Care-Adapted-to-India_VISION-2020-India.pdf. [Last cited on 2017 Nov 10].
8. National Family Health Survey-4. District Fact Sheet Davanagere, Karnataka. Mumbai: International Institute for Population Sciences; 2015. Available from: http://www.rchiips.org/nfhs/FCTS/KA/KA_FactSheet_567_Davanagere.pdf. [Last cited on 2017 Nov 10].
9. Rani PK, Raman R, Subramani S, Perumal G, Kumaramanickavel G, Sharma T. Knowledge of diabetes and diabetic retinopathy among rural populations in India and the influence of knowledge of diabetic retinopathy on attitude and practice. *Rural Remote Health* 2008;8:838. Available from: <https://www.rrh.org.au/journal/article/838>. [Last cited on 2017 Nov 15].
10. Thapa R, Paudyal G, Maharjan N, Bernstein PS. Demographics and awareness of diabetic retinopathy among diabetic patients attending the vitreo-retinal service at a tertiary eye care center in Nepal. *Nepal J Ophthalmol* 2012;4:10-6.
11. El Khatib BA, AlHawari HH, Al Bdour MD. Assessment of awareness of diabetic retinopathy among patients with diabetes mellitus attending the endocrine clinic at Jordan university hospital. *Madridge J Ophthalmol* 2017;2:14-8.
12. Tajunisah I, Wong PS, Tan LT, Rokiah P, Reddy SC. Awareness of eye complications and prevalence of retinopathy in the first visit to eye clinic among Type 2 diabetic patients. *Int J Ophthalmol* 2011;4:519-24.
13. Hussain R, Rajesh B, Giridhar A, Gopalakrishnan M, Sadasivan S, James J, *et al.* Knowledge and awareness about diabetes mellitus and diabetic retinopathy in suburban population of a south Indian state and its practice among the patients with diabetes mellitus: A population-based study. *Indian J Ophthalmol* 2016;64:272-6.

How to cite this article: Manu AS, Davalgi SB, Aithal SS, Dilip B. Awareness of diabetic retinopathy and barriers for eye screening among adults with type 2 diabetes mellitus attending tertiary care teaching hospital, Davanagere, Karnataka. *Int J Med Sci Public Health* 2018;7(9):686-690.

Source of Support: Nil, **Conflict of Interest:** None declared.