Original Article

Awareness about eye disorders and prevalence of symptomatic eye disorder in persons with diabetes: A cross-sectional study

Mahuya Pal Chattopadhyay[1], Snigdha Roy[2], Ritesh Singh[3*], Atanu Biswas[4]

{[1]Associate Professor, [4]Assistant Professor, Department of Ophthalmology} {[3]Assistant Professor, Department of Community Medicine}
[2]Final Year MBBS Student, College of Medicine and JNM Hospital, The West Bengal University of Health Sciences, Kalyani, West Bengal, INDIA.
Email: drriteshsingh@yahoo.com

Abstract

Background: Diabetes Mellitus is a major public health problem in India. Majority of diabetics develop eye problems later in their life. Diabetic eye disorders can be prevented by early detection and strict control of hyperglycaemia and regular eye check-ups. **Methods:** A cross sectional survey was conducted in 200 persons with diabetes attending the weekly diabetic clinic in a teaching hospital of West Bengal with the aim of finding out the awareness about the various eye disorders which may befall on the persons with diabetes mellitus. **Results:** 63.5% of the participants were females. Family history of diabetes was present in 39% of the participants. Median duration of the diabetes of the respondents was 4 years. 80% of the respondents were aware that diabetes can cause impaired vision. 61.5% of the participants were unaware of the schedule of regular eye check-up. 62% of the respondents had undergone at least one eye check-up to screen for any diabetic eye disease. 12% of participants said that a health care professional has ever said that they are suffering from any eye disease due to diabetes. Awareness about the diabetic retinopathy was significantly related with sex, education and occupation of the diabetics. 49% of the respondents had suffered from vision loss. Prevalence of diabetic retinopathy was 17.3% in the sampled subjects. **Conclusion:** Though the awareness about the eye disorders seems high there is no regularity of follow-ups in eye OPD by persons with diabetes.

Keywords: Diabetes, Diabetic Retinopathy, Eye diseases, Awareness, Prevalence

[*]**Address for Correspondence:**
Dr. Ritesh Singh, Assistant Professor, Department of Community Medicine, College of Medicine and JNM Hospital, The West Bengal University of Health Sciences, Kalyani, West Bengal, INDIA.
Email: drriteshsingh@yahoo.com
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INTRODUCTION

According to the World Health Organisation, 'diabetes mellitus' is a metabolic disorder of multiple aetiology characterized by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both[1]. 'Diabetes Mellitus' or simply 'diabetes' has become a major health problem in India. The country has about 40 million diabetic populations next only to China[1]. As diabetes is a microangiopathy, major proportion of the diabetic patients develop eye problems like diabetic retinopathy, diabetic maculopathy etc. These can be prevented by early detection and strict control of hyperglycaemia and regular eye check-ups. Regulation of hypertension and dyslipidaemia is also necessary to decrease incidence of diabetic eye diseases. According to National Eye Institute, almost two-thirds of persons with diabetes have some retinopathy at the time they are diagnosed as diabetic[1]. Incidence of diabetes is on the rise at an alarming rate in India. Consequently diabetic eye diseases are also occurring more frequently than ever. A large part of this can be attributed to the general lack of awareness on behalf of the diabetics[2,3]. Since early detection and timely ocular treatment may prevent many of the blinding ocular complication of diabetes, enhanced awareness of these complications among diabetic patients and the general public could be an effective public health measure. All persons with diabetes are not regularly

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screened for eye disorders. Studies have shown that if diabetics are regularly screened for eye disorders the complications which may be irreversible at late stages can be prevented by proper timely management. The current study aimed to know the awareness level of the diagnosed diabetics about the affection of eye due to diabetes and screen the respondents for the disorders affecting eye due to diabetes mellitus.

METHODS

A cross-sectional survey was conducted in a teaching hospital in municipality town in Nadia district of the state of West Bengal. The department of internal Medicine of the teaching hospital runs a diabetic clinic every Tuesday of the week. Both male and female adult diabetic patients attending the diabetic clinic were invited for enrolment in the study. They were enrolled after giving written informed consent. Adult diabetic patients who gave written informed consent to participate in the study and persons with diabetes enrolled for regular treatment either on lifestyle modification or drugs or both were eligible for the study. Persons having any eye disorder prior to them being diagnosed as diabetic were excluded from the study. We enrolled 200 diabetic subjects based on the sample size calculation from a previous study conducted with the similar objective[1]. All eligible subjects on the data collection days were enrolled. Since the diabetic clinic runs weekly the data collection was over in the week in which researcher enrolled the 200th subjects. Care was taken to avoid repetition as some patients had come more than once during the data collection period. The clearance from the Institutional Ethics Committee (IEC) was taken prior to initiation of the study and once the study was approved by Indian Council of Medical Research (ICMR). The written permission for conduction of the study at the diabetic clinic was taken from the Head of the Department of Medicine. Patients were told in detail about the study. Written informed consent was taken from the patients before enrolment. The patients were free to opt out of the study at any time they feel like. The confidentiality of the study participants was maintained and no personal identifying data were collected. All study participants were referred to the department of Ophthalmology for further investigations and management. A semi-structured interview schedule was designed in English. It had questions related to awareness of the subjects about different eye problems developing due to diabetes. Further questions probing the eye symptoms developing after being diagnosed as diabetes were asked. The questionnaire was translated in local language and then back translated in English to maintain the consistency. The questionnaire thus prepared was pre-tested in diabetic patients who were not part of the study. The data collected were entered in MS Excel 2010. The data were analysed by SPSS version 22.0. Chi-square test was used to compare the proportions. Two-tailed significance test with p value of 0.05 or less was considered to be statistically significant.

RESULTS

In total 200 persons with diabetes mellitus enrolled in the diabetic clinic of the teaching hospital who attended the clinic during the data collection period and who gave written informed consent to participate in the study were enrolled for the study. Around two-thirds (63.5%) of the participants were females. The mean (SD) age of the respondent was 51.54 (12.29) years. The range of the age was 22 to 83 years. Majority (34%) of the respondents did not attend any formal school. 74% of the respondents were currently married. As majority of the respondents were females, the main occupation of the respondents found out was homemaker. The median monthly family income was Rs. 4000. The range of income of the households was from Rs. 1000 to Rs 50000 per month (table 1).39% of the participants said that at least one of their first degree relative (either parent or sibling) is a known diabetic. In 60% of these cases either mother or father was a diabetic. The median duration of the diabetes of the respondents was 4 years. The range of the duration of the diabetes was from 1 week to 25 years. 86% of the participants were on any oral hypoglycaemic and diet control as advised in the diabetic clinic. We asked about the latest blood sugar report available with the patient. The latest blood sugar report of all the participants was seen. The level of blood sugar was in the normal range in only 18% of the respondents whereas 6% of the respondents could not provide any proof to show the current status of their diabetes control. Participants were further asked whether they suffer from raised blood pressure also. Around half of them were diagnosed hypertensive. Of the 96 who were hypertensive, 89 (92.7%) were on some medication for control of their hypertension. Only 39.6% of hypertensive has their blood pressure under control. Out of 200 diabetics interviewed only 71 (35.5%) have said in affirmation that their doctor has told them to get their eye examined by a professional regularly as they have high chances of getting eye diseases when compared to a normal person. But a majority (80%) of the participants were aware that diabetes can cause impaired vision. Major source of this information was a health care provider (46%). Around 75% of the respondents who were aware about the impaired vision due to diabetes knew that the impaired vision is curable. They were further asked about the treatment modalities. No one knew the specific therapy and half of them said that a combination of eye drops, eye

surgery, laser treatment and control of diabetes would help in the treatment of impaired vision due to diabetes. 61.5% of the participants were unaware of the schedule of regular eye check-up. 71% of the respondents were unaware about the fact that diabetes can cause haemorrhage in the eye. 44% of the respondents were aware that cataract can develop early in a person affected with diabetes. 56% of the respondents said that the strict blood sugar control would help in preventing any eye diseases that might develop due to diabetes.66% of the respondents were aware that diabetes can lead to permanent loss of vision if blood sugar is not under control. 62% of the respondents had undergone at least one eye check-up to screen for any diabetic eye disease prior to the study date. Each participant was asked whether any health care professional has ever said that s/he was suffering from any eye disease due to diabetes. Only 12% answered in affirmation. Only two persons had undergone laser treatment for diabetic retinopathy.49% of the respondents had suffered from vision loss (figure 1).Sex was significantly related with knowledge about the various eye disorders associated with diabetes (chi square value: 4.228, p value: .044) with male sex more aware about the eye diseases. Educated diabetics were significantly more aware about the diabetic retinopathy compared to less educated ones (chi square value: 19.389, p value: .000). Occupation was also significantly associated with awareness about diabetic retinopathy with homemaker having significant less knowledge about it (chi square value: 12.578, p value: .002). Best corrected visual acuity was examined in both eyes of all the participants (tables 2 and 3). Later Slit Lamp Biomicroscopy with +90 D Lens and fundus examination of all participants was done with direct and indirect ophthalmoscopy by an ophthalmologist to find out changes suggestive of diabetic retinopathy. It was found in 17.3% of the subjects (table 4).

DISCUSSION

Diabetes affects blood vessels of eye just like any other blood vessels of the human body. The incidence of diabetic retinopathy can be decreased if diabetics are aware of the condition and proper timely management of the disease takes place[2]. The findings of this cross sectional survey shows that awareness about various eye diseases due to diabetes mellitus is high in person affected with diabetes but consultation with ophthalmologist is low. Physicians fail to put across the significance of regular eye check-up to the patients when they attend the diabetic clinic. Even if the patient knows the importance of regular visit to ophthalmologist for eye check-up the frequency of actual visit is very irregular. A high proportion of the sampled patients suffered from visual loss and direct ophthalmoscope revealed a good number of diabetics had signs suggestive of diabetic retinopathy. In our study 80% of the diabetics knew that diabetes can cause visual loss. This figure is similar to I Mohammed at al study[1] conducted in Nigeria. In that study 84.3% of the patients were generally aware of diabetic retinopathy with their main source of information being hospital staff and fellow patients. In our study also the major source of the information was a health care provider. In the Nepal study[1] one major source of awareness was from family members, since one-third of cases had a positive family history in at least one-first-degree relative. This may be true in our study as 39% of the diabetics had positive family history of diabetes. In the present study 62% of the diabetics had undergone eye examination probably fundus examination prior to the study. This is high compared to 25% in the Nepal study. According to Martha at al[i] the knowledge about diabetic eye disease in diabetics was 83% and fifty percent of all the respondents went for eye check-ups. In the present study 80% of the diabetics were aware about any eye disease caused by diabetes and 62% had ever visited a doctor for eye check-up. Ebru N Cetil *et al*[5] found out that 39.8% of diabetics thought that good glycaemic control might cause diabetic retinopathy (DR). This figure is 34% in our study. While 86.7% thought that early diagnosis was possible in DR, 77.3% previously had eye examinations, and 41.9% stated that annual eye examinations were necessary for diabetics. Diabetics enrolled for the present study had a poor knowledge about the schedule of eye examinations by an ophthalmologist. 61% had no idea about the frequency of visit to an eye specialist and 24% would visit an ophthalmologist if there are any symptoms related to eye. The prevalence of diabetic retinopathy in our study is similar to a study by Rema *et al*[5] in the Chennai Urban Rural Epidemiology (CURES) Eye Study in south India where it was 17.6 per cent. We can conclude that the awareness about the diabetic retinopathy and other diseases affecting eye in the diabetes is high in the diabetics attending the diabetic clinic of teaching hospital of West Bengal. The prevalence of visual loss and diabetic retinopathy is quite high in this population. There is a need of generation of awareness about various eye disorders particularly diabetic retinopathy in masses. The health care professionals should emphasize the importance of regular eye check-up by a trained ophthalmologist to all diabetics seen by them. Facility should be made easily accessible to treat diabetic retinopathy. Since diabetic eye disease can present much before the actual diagnosis of diabetes is made it is very important to make people aware about the various eye disorders associated with diabetes mellitus.

Table 1: Socio-demographic and economic data of the study subjects

Variable	Frequency
Sex	Female (63.5%)
	Male (36.5%)
Age	Mean (SD): 51.54 (12.29) years
	Range: 22-83 years
Education	No formal schooling (34%)
	Less than primary school (13%)
	Primary school completed (16%)
	Secondary school completed (23%)
	Secondary school completed (23%)
	High school completed (8.5%)
	College/University completed (5.5%)
Occupation	Government employee (2.5%)
	Non-government employee (4.5%)
	Self-employed (25%)
	Student (.5%)
	Homemaker (55.5%)
	Retired (9.5%)
	Unemployed (2.5%)
Family monthly income	Median: INR 4000
	Range: INR 1000-50000

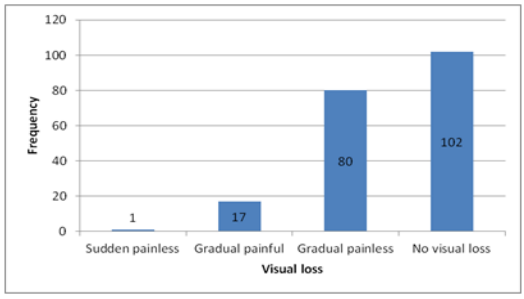

Figure 1: Loss of vision in participants (n=200)

Table 2: Visual acuity (right eye) of participants (n=191)

Visual acuity	Frequency	Percentage
6/6	100	52.4
6/9	35	18.3
6/12	13	6.8
6/18	12	6.3
6/24	8	4.2
6/36	4	2.1
6/60	6	3.1
5/60	1	0.5
4/60	4	2.1
3/60	1	0.5
2/60	1	0.5
1/60	1	0.5
FC	1	0.5
HM	1	0.5
PL	2	1.0
No vision	1	0.5
Total	**191**	**100**

Table 3: Visual acuity (left eye) of participants (n=191)

Visual acuity	Frequency	Percentage
6/6	98	51.3
6/9	32	16.8

6/12	13	6.8
6/18	13	6.8
6/24	8	4.2
6/36	4	2.1
6/60	6	3.1
5/60	4	2.1
4/60	1	0.5
2/60	2	1.0
1/60	2	1.0
FC	1	0.5
HM	5	2.6
No vision	2	1.0
Total	**191**	**100**

Table 4: Diabetic retinopathy (The International Classification for Diabetic Retinopathy grading system) in participants: (n=191)

Fundus finding	Frequency	Percentage
BE no DR	158	82.7
BE mild NPDR with no CSME	20	10.5
BE mild NPDR with CSME	2	1.0
BE moderate NPDR with or without CSME	2	1.0
BE severe NPDR with or without CSME	2	1.0
One eye NPDR and another PDR	1	0.5
BE PDR	4	2.1
BE No view of fundus	2	1.0
Total	**191**	**100**

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