

Awareness of Diabetic retinopathy among Indian patients of Diabetes mellitus visiting tertiary care centres

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Abstract

Introduction: Diabetic retinopathy is asymptomatic in early stages, but leads to gradual visual impairment, and comprises 4.8% of the global causes of blindness; it is worthy that it is detected early and treated as early as possible. Given that the reported prevalence of diabetic retinopathy in India ranges from 7.3 to 25%, we undertook a study to ascertain the level of awareness of retinopathy in adult patients with diabetes mellitus of any type, attending tertiary care hospital of Bhopal, Madhya Pradesh.

Materials & Method: This is an observational, cross sectional questionnaire based study. 500 adult patients of type 1 DM and type 2 DM were evaluated for possible inclusion in this study. Each patient was asked to fill a semi structured questionnaire. All clinical data was recorded on a Case Report Form. After filling the questionnaire, each patient was given a patient information sheet (PIS) consisting of general information about Diabetic Retinopathy.

Results: Out of 500 responders, 55% reported that they were advised by their treating physician that blindness is a

complication of diabetes. 45% were unaware. Only 15% of patients expressed awareness that they are at a risk of developing cataracts. Less than half (40%) of patients were informed by their healthcare provider that they need a routine yearly dilated eye exam due to their underlying diabetes. The majority (74% in total) had not had an eye exam in the past year, with 45% of this cohort indicating that they had not been informed by their doctor to do so.

Conclusion: A large number of our patients remain unaware of the complications of their diabetes, and hence may not seek its management. Subjects’ awareness of potential complications and their prevention is a potentially modifiable risk factor that might be improved through education.

Key Words: Diabetes mellitus, retinopathy, awareness

Introduction

Diabetes mellitus (DM) is a major medical problem throughout the world. Diabetes causes an array of long-term systemic complications that have considerable impact on the patient as well as society, as the disease typically affects individuals in their most productive years.¹⁻³ Patients with diabetes often develop ophthalmic

complications, such as corneal abnormalities, glaucoma, iris neovascularisation, cataracts, and neuropathies. The most common and potentially most blinding of these complications, however, is diabetic retinopathy,⁴⁻⁶ which is, in fact, the leading cause of new blindness in persons aged 25-74 years in the United States. Approximately 700,000 persons in the United States have proliferative diabetic retinopathy, with an annual incidence of 65,000. An estimate of the prevalence of diabetic retinopathy in the United States showed a high prevalence of 28.5% among those with diabetes aged 40 years or older.⁷

In the initial stages of diabetic retinopathy, patients are generally asymptomatic; in the more advanced stages of the disease, however, patients may experience symptoms that include floaters, blurred vision, distortion, and progressive visual acuity loss. Approximately 8,000 eyes become blind yearly because of diabetes. The treatment of diabetic retinopathy entails tremendous costs, but it has been estimated that this represents only one eighth of the costs of Social Security payments for vision loss. This cost does not compare to the cost in terms of loss of productivity and quality of life. One of the most important aspects in the management of diabetic retinopathy is patient education.

Since diabetic retinopathy is asymptomatic in early stages, but leads to gradual visual impairment, and comprises 4.8% of the global causes of blindness⁸, it is worthy that it is detected early and treated as early as possible. The American Diabetes Association initially recommends starting with a yearly dilated and comprehensive eye examination.⁹ Given that the reported prevalence of diabetic retinopathy in India ranges from 7.3 to 25%⁸, we undertook a study to ascertain the level of awareness of retinopathy in adult patients with diabetes mellitus (DM) of any type, attending tertiary care hospital of Bhopal, Madhya Pradesh.

Materials & Methods

Study Design: This is an observational, cross sectional questionnaire based study.

Study Setup: This study is conducted at Department of Ophthalmology and General Medicine of two tertiary care centres.

Study Duration: The duration of study was 4 months; March-2018 to June-2018.

Sampling: Purposive sampling technique is used for selection of desired samples according to inclusion criterion.

Sample Size: 500 adult patients (age >18 years) of type 1 DM and type 2 DM were evaluated for possible inclusion in this study.

Inclusion criteria: All adults who fulfill criteria of DM by American Diabetes Association criteria or already on treatment for DM were included in this study.

Exclusion criteria: Patients of malignant hypertension or having acute illness were excluded from the study.

Methods: Demographic characters like age, sex, height, waist circumference and weight of all subjects were noted. Detail history was recorded, general physical examination was done and detailed systemic examination was done. Routine investigations including complete blood counts, peripheral smear examination, fasting blood sugar (FBS), 2-hr postprandial blood sugar (PPBS), HbA1c, kidney function tests, liver function tests, lipid profile, and ultrasound of abdomen were done. Each patient was asked to fill a semi structured questionnaire. All clinical data was recorded on a Case Report Form. After filling the questionnaire, each patient was given a patient information sheet (PIS) consisting of general information about Diabetic Retinopathy.

Statistical Technique: Microsoft Excel® and SPSS® 20 for Windows® were used for data storage and analysis. The qualitative data were expressed in percentages and quantitative data were expressed as mean ± standard

deviation. Student's t test and Chi-Square test were used to determine statistical difference between variables.

Results

A total of 500 individuals diagnosed with DM were enrolled in the study, 98% of which were Type 2 DM cases while 2% were having Type 1 DM. 64% of total subjects were male. The mean age of the study subjects was 49.58±14.5 years. The mean age of diagnosis was 41.50±12.4 years, with the mean duration of having diabetes at 6.5±5.54 years. Risk factor control was sub-optimal, with the mean HbA1c of the cohort at 9.34%, mean LDL at 110.45 mg/dl, average fasting blood sugar at 185.31 mg/dl and average post-prandial blood sugar at 254.12 mg/dl.

Out of 500 responders, 55% reported that they were advised by their treating physician that blindness is a complication of diabetes. 45% were unaware. Only 15% of patients expressed awareness that they are at a risk of developing cataract. Less than half (40%) of patients were informed by their healthcare provider that they need a routine yearly dilated eye examination due to their underlying diabetes. The majority (74% in total) had not had an eye examination in the past year, with 45% of this cohort indicating that they had not been informed by their doctor to do so. A mere 23% reported a proper fundoscopic examination being done in which they had their pupils dilated. 58% of the total study population reported decreased visual acuity, with 7% of the subjects having documented mild non-proliferative retinopathy. A multi-variate analysis (Table 1) did not reveal any statistically significant correlation between factors such as worsening glycemic control or years since the diagnosis of Type 2 diabetes, vis-à-vis a lack of awareness.

Table 1. Comparison of variables in the two groups; aware (those who were aware of diabetic retinopathy) and unaware (those who were not aware about diabetic retinopathy).

Variable	Aware about retinopathy (n=275)	Unaware about retinopathy (n=225)	p-value
Demographic variables			
Age (years)	49.76±10.24	50.76±9.33	0.881
Gender-Males	64%	64%	-
Weight (Kg)	74.34±19.12	70.12±18.34	0.170
Height (cm)	164.4±9.64	166.52±7.28	0.978
BMI (Kg/m2)	28.62±4.8	27.83±4.48	0.228
BP Systolic	134.28±12.81	135.79±15.75	0.223
BP Diastolic	85.25±8.86	79.39±7.77	0.877
Age of diagnosis of diabetes (years)	45.37±7.97	44.76±15.29	0.319
Biochemical parameters			
Total cholesterol (mg/dL)	209.3±46.14	199.25±38.3	0.965
LDL (mg/dL)	109.86±57.21	110.67±15.10	0.601
HDL (mg/dL)	46±10.57	44±9.16	0.580
FBS (mg/dL)	185.91±58.00	183.23±73.09	0.310
PPBS (mg/dL)	258.74±86.65	253.12±64.61	0.749
HbA1c (%)	9.36±3.46	9.35±3.45	0.102

Discussion

Diabetic retinopathy is one of the major complications of diabetes and is the leading cause of blindness among working people in developing countries. The symptoms are blurred vision, dark spots or flashing lights, and sudden loss of vision. The development of diabetic retinopathy can be divided into nonproliferative diabetic

retinopathy (NPDR; subdivided into mild, moderate, and severe stages) with microaneurysms, hard exudates, hemorrhages, and venous abnormalities and proliferative diabetic retinopathy (PDR; advanced stage) with neovascularization, preretinal or vitreous hemorrhages, and fibrovascular proliferation. Development of glaucoma, retinal detachment, and vision loss may also happen at this stage. Diabetic retinopathy may cause macular edema when blood and fluid leak into the retina caused by swelling of the central retina. Multiple techniques have been used for detection, diagnosis, and evaluation of this disease including fundoscopic photography, fluorescence angiography, B-scan ultrasonography, and optical coherence tomography.

Our study highlighted that, despite being seen in a tertiary referral center and 58% of the study cohort reporting decreased visual acuity, only 2/3 of patients stated that they were advised that diabetes can lead to ophthalmic complications like blindness. Less than half reported being advised that they need a regular eye examination, which is in keeping with historical data. Interestingly, no correlation would be seen in terms of a lack of awareness and the duration of diabetes or worsening glycemia, for example.

The American Diabetes Association's "Standards of Medical Care in Diabetes-2018" include the following recommendations regarding diabetic retinopathy¹⁰: Optimize glycemic control to reduce the risk or slow the progression of diabetic retinopathy, Optimize blood pressure and serum lipid control to reduce the risk or slow the progression of diabetic retinopathy, Adults with type 1 diabetes should have an initial dilated and comprehensive eye examination by an ophthalmologist or optometrist within 5 years after the onset of diabetes

Patients with type 2 diabetes should have an initial dilated and comprehensive eye examination by an ophthalmologist or optometrist at the time of the diabetes

diagnosis. If there is no evidence of retinopathy for one or more annual eye exams and glycemia is well controlled, then exams every 1-2 years may be considered; if any level of diabetic retinopathy is present, subsequent dilated retinal examinations should be repeated at least annually by an ophthalmologist or optometrist; if retinopathy is progressing or sight-threatening, then examinations will be required more frequently. While retinal photography may serve as a screening tool for retinopathy, it is not a substitute for a comprehensive eye exam. Women with preexisting type 1 or type 2 diabetes who are planning pregnancy or who are pregnant should be counselled on the risk of development and/or progression of diabetic retinopathy. Eye examinations should occur before pregnancy or in the first trimester in patients with preexisting type 1 or type 2 diabetes, and then patients should be monitored every trimester and for 1 year postpartum as indicated by the degree of retinopathy. Promptly refer patients with any level of macular edema, severe nonproliferative diabetic retinopathy (a precursor of proliferative diabetic retinopathy), or any proliferative diabetic retinopathy to an ophthalmologist who is knowledgeable and experienced in the management of diabetic retinopathy. The traditional standard treatment, panretinal laser photocoagulation therapy, is indicated to reduce the risk of vision loss in patients with high-risk proliferative diabetic retinopathy and, in some cases, severe nonproliferative diabetic retinopathy.

Conclusion

A large number of our patients remain unaware of the complications of their diabetes, and hence may not seek its management. Subjects' awareness of potential complications and their prevention is a potentially modifiable risk factor that might be improved through education. It would be useful to incorporate the need for screening and that it should be regularly scheduled, as the

two most important awareness predictors, into education and/or self-management programmes for DM.

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