Original Article

Prevalence and Awareness of Diabetic Retinopathy among Known Diabetic Patients Visiting the Sagarmatha Chaudhary Eye Hospital, Lahan

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ABSTRACT

Introduction: Diabetic retinopathy causes irreversible blindness. Most of the patients visiting the hospital have no signs and symptoms until too late for effective treatment. Early diagnosis and treatment are important to prevent blindness due to diabetic retinopathy.

Objective: The study aimed to assess the awareness regarding diabetic retinopathy, the prevalence of diabetic retinopathy among diabetic patients, and its association with demographic characteristics.

Methods: The hospital-based analytical cross-sectional study at Sagarmatha Choudhary Eye Hospital from Feb 2018 to Dec 2018. Pretested tools were used to collect the data. Bivariate analysis was done using SPSS 20 version.

Results: A total of 303 participants was included in the study. The mean age of the participants was 53.9(±10.2) years. The prevalence of diabetic retinopathy was 72%. Among known diabetic patients, were 85(28%) had clinically significant macular edema, 51(16.8%) had Proliferative diabetic retinopathy, 38 (12.5%) had Mild non-proliferative diabetic retinopathy, 31(10.2%) had moderate non-proliferative diabetic retinopathy, 14(4.6%) had severe non-proliferative diabetic retinopathy and 84 (27.7%) had no DR. The odds of having diabetic retinopathy among knowing diabetic Mellitus was 1.59 times in comparison to no knowledge (95%CI: 0.93,2.7; p value=0.04). The reason for late coming to eye examination was less awareness 57%.

Conclusion: The prevalence of diabetic retinopathy was 3 in 4 among diabetic patients. Awareness regarding diabetic retinopathy was poor. There is a need to develop an awareness program on diabetic retinopathy among known diabetic patients.

Keywords: *Awareness; Diabetic retinopathy; Eye Hospital; Nepal*

Introduction

There are approximately 463 million people in the world living with diabetes.1 Diabetic retinopathy(DR), the leading cause of vision loss and blindness in adults 20–74 years of age2 is preventable and treatable.3 A systematic review and meta-analysis shows that the global prevalence of Diabetic Retinopathy, Proliferative Diabetic Retinopathy (PDR), and Non-Proliferative Diabetic Retinopathy (NPDR) among Type 2 Diabetic Mellitus (DM) patients were 28%, 6%, and 27% respectively; while the prevalence of PDR and NPDR in DR patients were 17% and 83% respectively.4 World Health Organization (WHO) has estimated that diabetic retinopathy is responsible for 4.8% of the 37 million cases of blindness throughout the world.5 Currently, cataracts and refractive error are responsible for most of the visual impairment in Asia, although diabetic retinopathy causes 3% to 7% of the total blindness throughout the region.6 The hospital-based study showed a 78% prevalence of DR among known DM in Nepal 7 and 21% at Patna Medical

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College, Bihar.8 A recent community-based study done at Kathmandu showed the prevalence of DR among patients with DM to be 19.4%.9 Bhaktapur's study showed that the prevalence of DR was 23.8% among persons with diabetes.10 A major reason behind this high prevalence is the lack of awareness among the patients who fail to achieve a timely diagnosis and medical attention.11 Moreover, 37% were unaware of diabetic retinopathy.12 which leads to an increase in the prevalence of blindness due to Diabetic retinopathy. A diabetic patient is 25 times more vulnerable to the possibility of getting blindness as compared to a healthy individual.13 Diabetic eye disease often has no early signs and symptoms. The typical standard of care for diabetic patients is to receive an annual dilated fundus examination and screening for Diabetic retinopathy. Unfortunately, only about half of patients with diabetes visit the eye specialist for annual retinal exams.14

Sagarmatha Choudhary Eye Hospital (SCEH) has been providing Vitro Retinal Services to needy people. Still many patients visiting the Vitro retinal department are in the late stage of DR at presentation and were unaware of their problem.

The objective of the study was to assess the awareness regarding diabetic retinopathy, the prevalence of DR among diabetic patients, and find out the reason for the late presentation among diabetes patients visiting SCEH.15 This finding will be useful for the eyecare providers to know the common status and prevalence of DR among the presenting patients and formulate treatment plans as well as counseling plan for the patients.

Methods

Study design: The hospital-based analytical cross-sectional study

Setting: The present study was carried out in the Sagarmatha Choudhary Eye Hospital, Lahan which is located in South-East Nepal (Province 2), at the East-West Highway close to the Indian border, neighboring the Indian state Bihar. The hospital was led by renowned ophthalmologist Dr. Albrecht Hennig, a German doctor working at Lahan for more than 3 decades for the prevention of blindness. The hospital provides more than 50,000 sights restoring surgery every year. In 2017, more than six hundred diabetic patients visited the VR department and among them 323 patients were treated with Retinal Laser. This hospital-based study was done at Sagarmatha Choudhary Eye Hospital from February 2018 to December 2018 in Lahan, Nepal.

Participants: The study subjects were all consecutive new diabetic patients attending the vitreoretinal department and willing to participate. Patients with a history of prior intervention for diabetic retinopathy such as laser therapy and surgical intervention were excluded from the study.

Ethical Consideration: The study was conducted according to the principles of the Declaration of Helsinki. Informed consent was obtained from the patients before enrollment in the study. Approval was taken from the IRC of NNJS Reg. no. ER-9.5/2021 for the conduction of the study.

Outcome Variables: Presence of Diabetic Retinopathy. Each fundus photograph was graded lesion by lesion, and the severity of retinopathy was determined using the proposed new international classification of diabetic retinopathy. Diabetic retinopathy was classified into five severity levels: (1) no retinopathy, (2) mild non-proliferative, (3) moderate non-proliferative, (4) severe non-proliferative, and (5) proliferative diabetic retinopathy (PDR). Diabetic macular edema was classified as clinically significant macular edema (CSME) or non-CSME, based on the Early Treatment Diabetic Retinopathy Study criteria. The eye having severe problems was selected for the analysis.

Data sources/ Measurements: The data was collected by the trained single Ophthalmic assistant of the retina department. All the data was entered into the excel sheet, data processing coding was done by using SPSS (Statistical Package of Social Sciences) version 17 (developed by IBM crop).

Bias: The pre-testing of tools was done and modification was made. The expert opinion was taken to finalize the tools. The questionnaire was translated into Nepali language and Maithili language was also used for an interview, to ensure that patients fully understood each question.

Study size: 303 patients from February to December 2018. A purposive sampling method was used.

Quantitative variables: Detailed demographics, education status, occupation, family income, family type, awareness of potential ocular problems from diabetes mellitus, family history of diabetes mellitus, duration of diabetes mellitus, and presence of hypertension. Awareness of DM, awareness on DR, the presenting and best-corrected

Snellen visual acuities was recorded. Detailed fundus evaluation was done after pupil dilation. Visual acuity (VA) was measured in both eyes by trained research optometrists using a Snellen E chart. Retinopathy was classified according to early treatment of diabetic retinopathy study (ETDRS) classification[16]. The WHO categorization was done for visual acuity. For analyzing the data, the eye having severe problems was selected for the study. Anterior segment examination was done by tabletop slit lamp (APPASAMY) model AIA 11 2S.

Statistical methods: For continuous data, mean and the standard deviation was calculated and binomial logistic regression and multivariate analysis were done to see the significance of association. Odds ratio was calculated at 95% confidence interval and p-value <0.05 was considered as significant level.

Results

A total of 303 participants participated in the study. The numbers of males were 95 (31.4%), and females were 208 (68.6%). The demographic data showed that 67.3% were from India, 255 (84%) were Hindu religion, 91 (30%) were illiterate, 87(28.7%) were housewives, 155(51.2%) were of joint family. The mean age of the participants was 53.9(±10.2) years. The median family income was 16000 (IQR:9000,32000), the median number of years since diagnosis of DM was 5(IQR:2,10), 253 (83.5%) were above the poverty line. (Table 1)

Awareness and practice regarding DR among the patients visiting the VR department of Sagarmatha Choudhary Eye Hospital

The majority (90%) used regular medicine for DM control, 96% said they took medicine by consulting a general physician. While asking regarding diabetes control, 70% said their diabetes was under control but when asking what is the effect of diabetes on health 63% answered they don›t know and 71% were unaware on the effect of diabetes on the retina. The majority (73%) had heard about the retinal service of SCEH. (Table 2)

Association of DR with demographic characteristics

The odds of having DR among females is 1.89 (95%CI:1.12,3.2; p value=0.00) times compared to males. The odds of having DR among one-year older population was 1.014 times the odds of having DR among one year younger participants (95% CI: 1.01,1.06). The odds of having DR among Indian patients is 1.39(95%CI: 0.83,2.36; p value=0.59) times compared to Nepal. The odds of having DR and Hinduism is 0.963 (95%CI: 0.48,1.92; p value=0.55) times compared to the Muslim religion, the odds of having DR among illiterate is 1.83 times compared to literate (95% CI:1.01,3.31; p value=0.01), the odds of having DR among nuclear family is 0.88 times compared to the joint family(95%CI: 0.53,1.45;p value=0.162), the odds of having DR among above poverty line is 1.91 times (95%CI: 0.88,4.14; p value=0.44) The odds of having DR among known diabetics was 1.59 times in comparison to no knowledge (95%CI: 0.93,2.7;p value=0.04) Similarly, the odds of having DR among known diabetics was 1.5 times in comparison to no knowledge on DR (95%CI: 0.88,2.58;p value=0.19). The odds of having DR among having a history of HTN was less likely to 0.47 in comparison to no history of HTN (95%CI: 0.28,0.78; p value=0.11), The odds of having DR among the family history of DM is less likely to those having no history of DM (95% CI:0.37,1.13; p value=0.16). The odds of having DR among the duration of diabetes >10 years is 2.68 times in comparison to <10 years (95% CI:1.33,5.38; p value=0.01).

The multivariate logistic regression analysis showed that the odds of having DR are significantly associated with gender, age, education, knowledge of DM, and duration of DM. (Table 3)

The prevalence of diabetic retinopathy was 72(95% CI: 66.9, 77.2). (Figure 1)

Among known diabetic patients, 85(28%) had clinically significant macular edema, 51(16.8%) had Proliferative diabetic retinopathy, 38 (12.5%) had Mild non-proliferative diabetic retinopathy, 31(10.2%) had Moderate non-proliferative diabetic retinopathy, 14(4.6%) had Severe non-proliferative diabetic retinopathy and 84 (27.7%) had no DR. (Table 4)

Uncorrected visual acuity was found to be normal in31.5% and blindin 26.9% in the right eye which improved after refraction to normal (37.4%), and blind (26%). Similarly, uncorrected visual acuity was found to be normal in 32%, blind in 22.8% in the left eye which improved after refraction to normal in 41% and blind in 22.4%. (Fig 2)

While asking the reason for late coming for eye examination, 57% said they had less awareness about eye examination, 28% said they were under treatment at other eye hospitals and 15% did not respond. (Fig-3)

Discussion

In this hospital-based study, the awareness on DR was found to be poor, the prevalence of diabetic retinopathy was 3 in 4 among known diabetic patients visiting SCEH, Lahan. Regarding the stage of DR, majority had clinically significant macular edema. DR was seen more in females compared to males. The reason for the late presentation was having less awareness about the disease.

The awareness on DR was 29% in this study, which is less than the study done in Ethiopia 47%.17 The global prevalence of DR among diabetic patients was 34.6% (95% CI 34.5–34.8) for any DR.18 The findings of this study show that the prevalence of DR among known diabetic patients was 72% (95% CI: 66.9, 77.2) which is similar to the study done at Tilganga Institute of Ophthalmology, which shows 78% had DR,7 other studies show 44%,19 49% in India, 50% in Kenya study and 21% in Patna study.8 Similarly, the community-based study showed the prevalence of DR to be 16.20 The pathogenesis of DR is multifactorial but is primarily due to the metabolic effects of chronic hyperglycemia, which result in dramatic vascular changes and subsequent retinal injury and ischemia.21 Most of the patients have no signs and symptoms until it's too late for effective treatment.

The educational level of the participants in this study is also low (30% were illiterate and 26% were of primary level) which is similar to findings seen in the study done at Tilganga Institute of Ophthalmology by Thapa et al. (more than half were unable to read and write)7

In this study, clinically significant macular edema was found in 85(28%) of DR cases in contrast to the study done in India which showed 51%.22 The community-based study done at Dharan showed 3.8% cases of CSME.23 Similarly, in this study 51(16.8%) had Proliferative diabetic retinopathy but the study done at Patna showed 28.6%.24 This shows that most of the patients presenting to our hospital are at an advanced stage of DR.

In this study, the association of DR with gender, country, education, and time duration of diabetes mellitus was statistically significant while religion, history of HTN, family history of DM was not statistically significant.

The trained staff collected data and fundus evaluation was done by an Ophthalmologist. The study was hospital-based and might not be generalized for the general community. Despite this, it is important to counsel patients visiting for eye examination regarding the importance of regular examination of the eye, screening, early diagnosis, and treatment of Diabetic retinopathy to reduce the global burden of blindness due to diabetic retinopathy.

Conclusion

The study concludes that the prevalence of DR among known diabetic patients is very high. Most of the patient›s visits were at the late stage of DR. The reason for the late presentation was having less awareness. Hence there is a need to increase awareness regarding DM and DR among the patients visiting hospitals and in the general community.

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