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PREVALENCE OF DIABETIC RETINOPATHY AMONGST RURAL POPULATION OF CENTRAL INDIA- A PROSPECTIVE STUDY AT TERTIARY CARE HOSPITAL

Medicine

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ABSTRACT

Purpose-To evaluate the prevalence of diabetic retinopathy and its risk factors among the known diabetic individuals over two and half year period. Material & Methods- Ophthalmological evaluation of 1000 diabetic patients were done. History of smoking was taken. Fasting & post prandial Blood Sugar (FBS,PPBS) and HbA1c were also measured. Results- Mean age was 53.59+10.89 years and 64.2% were males. Prevalence of DR in the study population was 37%. In patients with DR, majority had moderate Non-Proliferative DR (NPDR) (15.0%), followed by mild NPDR(8.5%), severe NPDR (8.0 %) and very severe NPDR(4.5%), PDR(1.0%).CSME(clinically significant macular edema)was found in 13.8%. Mean age, duration of diabetes, FBS, PPBS and HbA1c levels were significantly higher amongst the patients with DR. Conclusions- In our study, 37 % of diabetes patients were found to have diabetic retinopathy associated with age, duration of diabetes and blood sugar levels.

KEYWORDS

Diabetic retinopathy,prevalence,blood sugar,Rural

INTRODUCTION

Diabetes mellitus is a metabolic disease known since ancient times, characterized by hyperglycaemia with its severe variations, secondary to the decrease of endogenous insulin efficiency. The World Health Organization (WHO) estimated that approximately 180 million people worldwide have diabetes. This proportion is expected to rise within next 20 years [1].

Diabetic retinopathy, one of the most frequent complications of diabetes, remains a major public health problem with significant socioeconomic implications, affecting approximately 50% of diabetic subjects, and remains the leading cause of blindness in working-age populations of industrialized countries[2,3] . Patients with diabetic retinopathy (DR) are 25 times more likely to become blind than non-diabetics[4].

Investigating the prevalence of diabetic retinopathy is important because it is a key indicator of systemic diabetic microvascular complications, and as such, a indicator of the impact of diabetes. So, the present study aims to evaluate the prevalence of DR and factors responsible for increasing the risk of development of diabetic retinopathy among diabetes patients.

MATERIAL AND METHODS

It was a cross-sectional, prospective observational study. 1000 already diagnosed diabetic subjects of age 20-80 years were included in the study. Patients with hazy media whose fundi could not be examined and patients with any other eye disease affecting fundus were excluded from the study. The study was explained to the subject and consent was taken. Data regarding age, gender, age at onset of diabetes, duration of diabetes, history of smoking were documented.

The presenting and the best corrected Visual Acuity (VA) using Snellen's chart were recorded. All patients had their pupils dilated with 1% tropicamide and was examined for DR by indirect ophthalmoscopy and slit lamp biomicroscopy and Color stereoscopic fundus photographs were taken. Features identified was recorded and retinopathy was classified in to the following categories, according to the ETDRS classification; normal, mild Non Proliferative DR (NPDR), moderate NPDR, severe NPDR, proliferative DR and clinically significant macular edema[5]. The retinopathy changes in either eye was considered a diagnosis of DR and when asymmetrical DR was present the stage of retinopathy was based on the eye having more severe grade of DR.

The results were presented as frequencies and percentages. All the analysis was carried out on SPSS 20.0 version (Chicago, Inc., USA). Means were compared using Student's t test. A p-value <0.05 was considered as significant. The data, thus analyzed, were made to draw important conclusions.

RESULTS

We have registered 2000 eyes of 1000 diabetic patients. Of these 1000 sample size,642(64.2%) were males and 358(35.8%) were females. There were 55(5.5%) patients with type 1 diabetes mellitus and 945(94.5%) patients of type 2 diabetes mellitus. The patients were of the mean age 53.59±10.89 years (Range 23-75 years). The mean duration of diabetes in the study patients was 6.67±5.40 years (Range 1-29 years). The mean fasting blood sugar, post prandial blood sugar and HbA1C in the patients were 137.08 ±34.44 mg/dl, 218.13 ±70.57 mg/dl and 6.65 ±2.88 % respectively(Table 1).

	Mean	Standard deviation
Age(years)	53.59	10.89
Duration of diabetes(years)	6.67	5.40
FBS(in mg/dl)	137.08	34.44
PPBS (in mg/dl)	218.13	70.57
Hb1Ac (in %)	6.65	2.88

The mean age of the patients and their duration of diabetes with DR changes was significantly higher than that of the patients with normal fundus i.e. fundus changes were observed more commonly in the older patients and in those with longer duration of diabetes.The patients with fundus changes were found to have greater value of mean FBS(p-0.011),PPBS(p-0.013) & HbA1C(p-0.005) than patients with normal fundus.(Table 2)

Table 2-Correlation between means with fundus findings

Mean	Normal fundus	DR present	P value
Age(years)	51.99±10.36	55.86± 11.30	0.014
Duration of diabetes(years)	4.68±4.45	8.05± 6.16	0.000
FBS(in mg/dl)	132.41+34.79	145.04+32.55	0.011
PPBS(in mg/dl)	208.56+68.73	234.42+71.15	0.013
Hb1Ac(in %)	6.17 +2.39	7.46 +3.42	0.005

Of the 190 smokers(19%), DR changes were present in 28.9% and their comparison with non-smokers was not statistically significant(p value 0.27). So we conclude that in our study smoking had no relation with changes in fundus.

On fundus examination, there was no DR in 63.0% while 37.0% shows various degrees of retinopathies. Mild NPDR (non proliferative diabetic retinopathy) changes were seen in 8.5%,moderate NPDR in 15.0%,severe NPDR 8.0%,very severe NPDR 4.5%, PDR changes were seen in 1.0% of total DR cases.CSME(clinically significant macular edema)were seen in 13.8%(Fig 1). The most commonly occurring manifestation was microaneurysms, followed by haemorrhages, hard exudates and soft exudates.

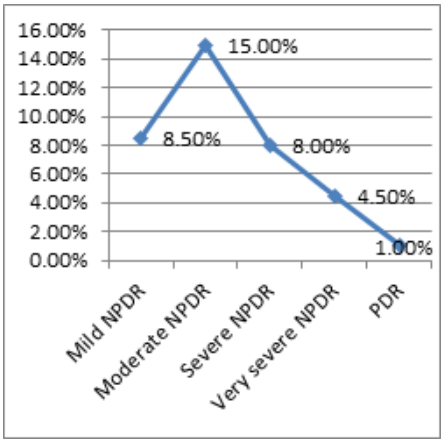

Fig 1-Classification of diabetic retinopathy

DISCUSSION

The incidence of DR among study cases was 37% similar to study by Raman *et al*. (18.1%), Rema *et al*. (17.6%), Namperumalsamy *et al*. (10.6%), Narendran *et al*. (26.2%) and Dandona *et al*. (22.58%).[6,7,8,9,10]

The prevalence of diabetic retinopathy has been shown to increase with age, even after adjustment for duration of diabetes[11] .In our study also,it is observed that fundus changes were more common in older patients(p-0.014) similar to the Beaver Dam Eye Study.[12] and Framingham Eye Study[13].Many studies have shown an increased prevalence of DR as the duration of diabetes increases[7,14,15] similar to our study(p value < 0.001).

Many studies suggested that the development and progression of DR is influenced by the level of hyperglycaemia[7,15,16]. A meta-analysis of three large population-based studies also found a graded relationship between the level of glycemia and frequency of retinopathy signs [17] similar to our study,which showed DR changes in patients with greater mean FBS(p-0.011),PPBS(p-0.013) and $HbA1_c$ (p-0.005). So, a more aggressive management of glycemia could reduce the development and progression of microvascular complications in diabetes. The data from these studies suggest that controlling risk factors can help to prevent DR.

Incidence of DR changes in smokers were 28.9%, which suggests that smoking is not a risk factor for appearance of fundus changes. But, there are evidence which shows that smoking is a risk factor for DR.[18-20]

On fundus examination, there was no DR in 630 eyes(63.0%),Mild NPDR (non proliferative diabetic retinopathy) changes were seen in 8.5%, moderate NPDR changes were seen in 15.0%, severe NPDR changes were seen in 8.0%, very severe NPDR changes were seen in 4.5%, PDR changes were seen in 1.0%. CSME (clinically significant macular edema)were seen in 13.8% of DR cases.

Limitations of the study is that it was a hospital based study. So, there was a referral bias. Therefore, the actual prevalence of diabetic retinopathy may have been underestimated.

CONCLUSION

The prevalence of DR was found to be 37% in present study especially high among older age group and in the individual with longer duration of diabetes. So screening of all the diabetic patients should be performed routinely to prevent severe vision threatening complications especially among rural population.

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