

## A Cross Sectional Study at a Tertiary Care Hospital on Risk Factor Associated with Retinopathy: A Complication of Diabetes

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### ABSTRACT

**Background:** Diabetes mellitus is one of the world's commonest and rapidly growing chronic disorders and a chief cause of vision loss due to its long term consequences. There have been various researches indicating that screening, quick detection and speedy treatment of retinopathy can prevent diabetes-related vision impairment. The aim of the present study was to assess the prevalence and risk factors for diabetic retinopathy.

**Materials and Methods:** The present cross-sectional survey was conducted in Department of Ophthalmology, Santosh Medical College & Hospital, Ghaziabad, Uttar Pradesh, India. The study enrolled all the subjects- diabetic or non-diabetic reporting to the OPD of the department. Only subjects with completed medical records were enrolled in the study. The medical records of the subjects were assessed for age, gender and duration of type 2 diabetes. Subjects taking antihypertensive medications or with BP level  $> 140 / > 90$  mmHg were regarded as hypertensive. The cut off value of glycosylated hemoglobin was taken as 7% (53 mmol/mol). All the data was arranged in a tabulated form and analyzed using SPSS software.

**Results:** There were 550 subjects with the mean age of  $50.56 \pm 2.65$  years. The mean age of subjects with retinopathy was  $53.98 \pm 3.21$  years. The mean age of diabetics was  $48.32 \pm 1.98$  years. Amongst the subjects with retinopathy, there were 68 subjects with diabetes more than 10 year duration. There were 144 males and 45 females who were ignorant about diabetes.

**Conclusion:** Duration of diabetes and history of hypertension are closely associated with the risk of retinopathy. Subjects ignorant about diabetes are at a greater risk for the condition.

**KEYWORDS:** Diabetes, Hypertension, Retinopathy.

### INTRODUCTION

Diabetes mellitus is one of the world's commonest and rapidly growing chronic disorder and a chief cause of vision loss due to its long term consequences.<sup>1</sup> As per the World Health Organization, it is observed that the total number of subjects with diabetes are estimated double from 171 million in the year 2000 to 366 million by the year 2030.<sup>2</sup> Diabetic retinopathy is a common microvascular complication associated with diabetes mellitus, and is one of the leading reasons of acquired vision loss globally in middle-aged subjects of

economically weaker areas.<sup>1,3,4</sup> With the cumulative number of subjects with diabetes, the number of diabetic retinopathy cases are expected to rise to 56.3 million, by 2030.<sup>5</sup>

Over the past few years, there have been major improvements in understanding the epidemiology of retinopathy, control of diabetes mellitus to prevent the development and progression of diabetic retinopathy, diagnosis and management of retinopathy cases. There have been various researches indicating that screening,

quick detection and speedy treatment of retinopathy can prevent diabetes-related vision impairment.<sup>6</sup> Randomized controlled studies have proven that appropriate and early management can decrease an individual's risk of vision loss by 57%.<sup>7</sup> However, the screening programs for retinopathy in developing and developed countries remain controversial, and are continuously challenged by lack of proper guidelines therefore there is a need to implement and maintain a comprehensive screening programs for retinopathy.<sup>8</sup> The aim of the present study was to assess the prevalence and risk factors for diabetic retinopathy.

## MATERIALS AND METHODS

The present cross-sectional survey was conducted in Department of Ophthalmology, Santosh Medical College & Hospital, Ghaziabad, Uttar Pradesh, India.

The study enrolled all the subjects- diabetic or non-diabetic reporting to the OPD of the department. The subjects between 30 to 60 years were enrolled in the study. Subjects with associated co morbidities, immunosuppression or coagulopathies were excluded

from the study. The study was approved by the institutional ethical board and all the subjects were informed about the study and a written consent was obtained from all in their vernacular language. Only subjects with completed medical records were enrolled in the study. The medical records of the subjects were assessed for age, gender and duration of type 2 diabetes. Subjects were also assessed on their awareness and knowledge about diabetes. Medical history of the subjects like hypertension was noted in the proforma. Blood samples of the patients were obtained, and glycosylated hemoglobin levels were estimated. The type of treatment for diabetes was recorded. The level of glycemic control of the subjects was assessed.

Subjects taking antihypertensive medications or with BP level > 140 / > 90 mmHg were regarded as hypertensive. The cut off value of glycosylated hemoglobin was taken as 7% (53 mmol/mol). Subjects with abnormal levels of BP or laboratory investigations were categorized as bad metabolic control, or else as good metabolic control. All the data was arranged in a tabulated form and analyzed using SPSS software.

**Table 1: Demographic details and clinical and laboratory findings**

Variable		Gender		Diabetic		Diabetic retinopathy	
		Female (n=250)	Male (n=300)	Yes (n=170)	No (n=380)	Yes (n=120)	No (n=50)
Age ( years)		47.54+/-	48.32+/-	48.32+/-	47.66+/-	53.98+/-	35.83+/-
		2.89	5.28	1.98	6.21	3.21	2.91
Duration of diabetes	<10 years	115	183	90	-	52	38
	>10 years	135	117	80	-	68	12
Ignorant about diabetes	Yes	45	144	68	-	36	35
	No	205	156	102	-	84	15
History of hypertension	Yes	100	114	54	156	43	18
	No	150	186	116	224	77	32
HbA1c	< 7%	117	159	63	-	42	21
	>7%	133	141	107		78	29
Metabolic control	Good control	43	45	7	80	6	15
	Bad control	207	255	163	300	114	35
Treatment	Yes	117	126	77	-	60	27
	No	133	174	93	-	60	23

## RESULTS

There were 550 subjects with the mean age of 50.56 +/- 2.65 years. The present study enrolled 550 subjects, out of which 300 were males and 250 were females. The mean age amongst males was 48.32+/-5.28 years and females were 47.54+/- 2.89 years. Amongst these there were 170 diabetic and rest non-diabetics. Amongst the diabetics 120 had retinopathy. The mean age of subjects with retinopathy was 53.98+/-3.21 years. The mean age of diabetics was 48.32+/-1.98 years. Amongst the subjects with retinopathy, there were 68 subjects with

diabetes more than 10 year duration. There were 144 males and 45 females who were ignorant about diabetes. The HbA1c level was more than 7% amongst 78 subjects with retinopathy. There were 207 females and 255 males with bad control of the metabolic conditions. Good control was observed only amongst 6 subjects with retinopathy. There were 43 subjects with retinopathy and 18 subjects without retinopathy with a history of diabetes. There were 77 diabetics receiving treatment for the same and rest 93 were not having any kind of treatment.

## DISCUSSION

The Early Treatment Diabetic Retinopathy Study Has Given a classification for diabetic retinopathy and divided it into early stage known as non-proliferative retinopathy and a late stage named proliferative retinopathy.<sup>9</sup> Around one fourth of the diabetic population is affected by diabetic retinopathy of different levels and 5% suffer from severe degree of the same. Diabetic retinopathy is accountable of 10% of new cases of blindness per year, there is a 25% higher risk of retinopathy amongst the diabetic compared to the general population. Half of patients with diabetes of more than 15 years duration present with retinopathy. As per the Wisconsin Epidemiologic Study of Diabetic Retinopathy, the prevalence of retinopathy is low in the first five years of diagnosis of diabetes, and the risk of progression of disease is directly related to the duration.<sup>10</sup> As per the United Kingdom Prospective Diabetic Study<sup>11</sup> level less than 7% of glycosylated hemoglobin is related to minor progression of the condition. Moreover, the Diabetes Control and Complications Trial<sup>12</sup> concluded that a controlled levels of glycosylated hemoglobin decrease the risk of ocular damage by 76%, renal damage by 50% and 60% neurological illness. In our study, Amongst the diabetics 120 had retinopathy. The mean age of subjects with retinopathy was 53.98 $\pm$ 3.21 years. Amongst the subjects with retinopathy, there were 68 subjects with diabetes more than 10 year duration. There were 144 males and 45 females who were ignorant about diabetes. The HbA1c level was more than 7% amongst 78 subjects with retinopathy. There were 207 females and 255 males with bad control of the metabolic conditions. Good control was observed only amongst 6 subjects with retinopathy. There were 43 subjects with retinopathy and 18 subjects without retinopathy with a history of diabetes. There were 77 diabetics receiving treatment for the same and rest 93 were not having any kind of treatment. Retinopathy is one of the frequent reasons of vision loss worldwide and is the chief cause behind impaired vision amongst patients between 25 and 74 years of age. Vision loss from retinopathy can occur secondary to macular edema that involves the macula, hemorrhage, detachment of retinal, or neovascular glaucoma. Duration of illness is also strongly related to the occurrence of retinopathy.<sup>13,14</sup> As per the physiopathology the high BP itself can lead to vascular damage leading to the progression of retinopathy.<sup>15,16</sup> The available data supports a useful effect of intrusion to decrease blood pressure thus preventing retinopathy for up to 4 to 5 years.<sup>17</sup>

## CONCLUSION

Retinopathy is a common complication amongst subjects with diabetes of grater duration. Due to lack of knowledge and healthcare facilities it can subsequently

lead to vision loss. Duration of diabetes and history of hypertension are closely associated with the risk of retinopathy. Subjects ignorant about diabetes are at a greater risk for the condition.

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