

# Study on Awareness and Assessment of Diabetic Retinopathy in Diabetic Patients Attending Ophthalmology Clinic at a Tertiary Care Hospital, Telangana State

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## ABSTRACT

**Introduction:** According to WHO with increasing number in diabetic population in India, more patients are going to report with ocular Complications. Early diagnosis and management can prevent blindness due to end stage diabetic retinopathy. This study was conducted to assess the knowledge and estimate the prevalence of diabetic retinopathy among the study subjects who are previously diagnosed with diabetes.

**Materials and methods:** Cross-sectional observational study conducted in hospital from June 2019 to September 2019. 108 previously diagnosed diabetic patients who attended the ophthalmology clinic were selected. Detailed history of study participants was collected by administering questionnaire, the questionnaire was assessed and responses are analysed as poor, average and good for knowledge on diabetic retinopathy and additional information regarding associated factors, presence of family history, hypertension, addictions like smoking followed by estimation of glycaemic index by checking HbA1c levels and ophthalmological examination for diabetic retinopathy which was carried out by ophthalmologists. As per the findings of fundus diabetic retinopathy is graded according to ETDRS classification.

**Results:** 108 diabetic patients are included in this study out of which mean age of males and females were  $45.61 \pm 14.21$  years and  $49.68 \pm 17.16$  years. Among the 108 diabetic patients the knowledge on diabetic retinopathy is good in only 43 (39.81%). 65 (60.19%) suffering with different severity of retinopathy. Of the 65 patients who had signs of diabetic retinopathy there is statistical association with age of the patients, positive family history of diabetes, poor glycaemic control, duration of diabetes, associated hypertension and smoking.

**Conclusion:** Prevalence of diabetic retinopathy is 60.9% in the study population with significant association between risk factors. This study suggests there is immediate need of creating awareness among the community along with early diagnosis and treatment to prevent avoidable blindness caused by retinopathy.

**Keywords:** Diabetes Mellitus, Diabetic Retinopathy, HbA1c, ETDRS

## INTRODUCTION

422 million people are suffering with diabetes worldwide, particularly in developing countries. Diabetes is currently one of the leading fourth leading cause of death in the world. The global estimates of diabetes among adults above 18 years of age increased from 4.7% in 1980 to 8.5% in 2014.<sup>1</sup> Diabetes can be treated so that its consequences can be

avoided or delayed with diet, physical activity and regular screening and treatment for the complications. Diabetic retinopathy is an important cause of blindness; it is because of long-term accumulated damage to the small blood vessels in the retina. 2.6% of global blindness is because of diabetes.<sup>2</sup> The prevalence of diabetic retinopathy in India is between 7.3% - 25%.<sup>3</sup> Diabetic retinopathy is asymptomatic in its early stages. Hence, regular screening of diabetic patients and periodic follow up remains the only option to detect and treat the condition before it causes visual loss. However, many studies have suggested that this can be achieved only with better awareness and knowledge on diabetes and its complications like diabetic retinopathy and its effects on vision; due to lack of awareness there is delay in diagnosis and management.<sup>4,5</sup> There have been many studies done in other states of India to assess the awareness and knowledge on diabetes and diabetic retinopathy but in Telangana state there are no studies on knowledge and awareness on diabetic retinopathy, but studies on assessment of diabetic retinopathy are very limited.<sup>6,7,8</sup>

This study aims to assess the knowledge of diabetic retinopathy among the diabetics and estimate the occurrence of diabetic retinopathy among the study subjects. Objectives of study are 1. Assess knowledge, attitude, practices about diabetic retinopathy among patients already diagnosed as diabetes 2. Assess prevalence of diabetic retinopathy among the diabetic patients attending the eye care clinic 3. Assess the associated factors among diabetic patients.

## MATERIAL AND METHODS

Cross-sectional observational study was conducted in the ophthalmology clinic from June 2019 to September 2019 at tertiary care hospital.

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### Inclusion criteria

Patients of age more than 20 years and already diagnosed as diabetics following the standard diagnostic criteria recommended by American Diabetic Association.

### Exclusion criteria

Patients with mature cataracts, hypertensive retinopathy, exposure to radiation other eye diseases and unable to answer questionnaire and not given consent for examination were also excluded as they could mimic fundus features with diabetic retinopathy.

108 patients with diabetes attending the eye care clinic were selected with approval of Institutional ethics committee (IEC). Detailed history of study participants was collected by administering local language questionnaire, the questionnaire was assessed and responses are analysed as poor, average and good for knowledge on diabetic retinopathy and additional information regarding associated factors, presence of positive family history of diabetes, associated hypertension, addictions like smoking followed by General physical examination and ophthalmological examination for diabetic retinopathy which was carried out by ophthalmologists with aid of slit lamp for examination and fundus photography of both eyes with dilated pupils. Detailed fundus examination with both direct and indirect ophthalmoscopy was done as screening procedure for diabetic retinopathy. As per the findings of fundus diabetic retinopathy is graded according to ETDRS classification.

### STATISTICAL ANALYSIS

The data was entered in Microsoft excel 2010; analysed using the SPSS version 21 and the results were expressed as simple proportions and percentages. Chi-square test was used for statistical association as test of significance.

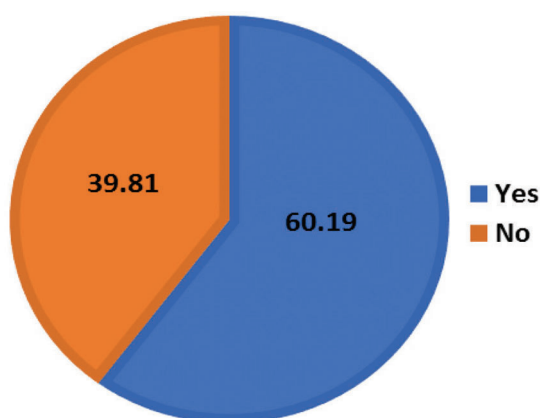
### RESULTS

A sample of 108 diabetic patients are included in this study out of which 74 (68.52%) were males and 34 (31.48%) were females. Among them 10 (9.26%) were 20-30 years, 45 (41.67%) were 31- 40, 34 (31.48%) were 41-60 years followed by 19 (17.59%) aged above 61 years. Mean age of males and females were  $45.61 \pm 14.21$  years and  $49.68 \pm 17.16$  years. Among them 26 (24.07%) were illiterate,

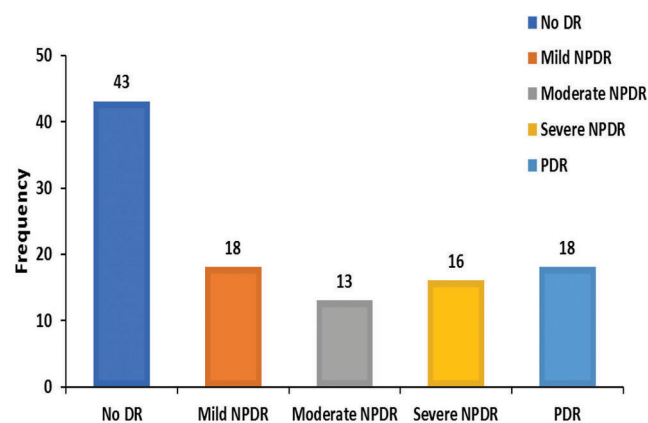
32 (29.63%) had primary education, 40 (37.04%) up to secondary education and only 10 (9.26%) had primary education. All the patients had type 2 DM. About 33

Variable	Frequency	Percentage
<b>Gender</b>		
Males	74	68.52
Females	34	31.48
<b>Age (in years)</b>		
20-30	10	9.26
31-40	45	41.67
41-60	34	31.48
>61	19	17.59
Mean of Age		
	Male	Female
	45.61±14.21	49.68±17.16
Over all	46.89±15.24	
<b>Education</b>		
Illiterate	26	24.07
Primary	32	29.63
Secondary	40	37.04
Higher secondary	10	9.26
<b>Duration of Diabetes</b>		
<5 years	33	30.56
5-10 years	18	24.07
11-15 years	26	16.67
>15 years	31	17.59
<b>Family History of Diabetes</b>		
Yes	22	20.37
No	86	79.63
<b>Any other diseases</b>		
Hypertension	40	37.04
Heart Disease	4	3.7
Kidney disease	6	5.56
None	58	53.7
<b>Glycemic Control (HbA1C=&gt;7-8%)</b>		
Yes	72	66.67
No	36	33.33
<b>History of Smoking</b>		
Yes	44	40.74
No	64	59.26

**Table-1:** Socio demographic profile of study subjects (N=108)



**Figure-1:** Pie chart showing Prevalence of Diabetic retinopathy in study population (N=65)



**Figure-2:** Bar graph showing Distribution of diabetic retinopathy in study population (N=108)

Variable	Frequency	Percentage
Knowledge regarding DR		
Poor (1-4)	12	11.11
Average (5-7)	53	49.07
Good (8-10)	43	39.81
Do you know that DM will affect eyes		
Yes	40	37.04
No	68	62.96
Do you know that DR requires eye screening		
Yes	38	35.19
No	70	64.81
If yes, how many times you screen in year		
None	6	15.79
Once	20	52.63
More than once	12	31.58
Are you aware that DR can cause blindness		
Yes	32	29.63
No	76	70.37

**Table-2:** KAP (Knowledge, Attitude and practices) against DR among study subjects (N=108)

Variable	Frequency	Percentage
Diabetic retinopathy		
Yes	65	60.19
No	43	39.81
Stages of DR		
No DR	43	39.81
Mild NPDR	18	16.67
Moderate NPDR	13	12.04
Severe NPDR	16	14.81
PDR	18	16.67

**Table-3:** Prevalence and Distribution of diabetic retinopathy in study subjects (N=108)

(30.56%) patients have history of DM < 5 yrs, 18 (24.07%) 5-10 years duration, 26 (16.67%) 11-15 years and 31(28.7%) more than 15years. Among which only 22 (20.37%) patients were having positive family history of diabetes, 40 (37.04%) suffering with hypertension, 4 (3.7%) cardiac disease, 6 (5.56%) kidney disease and 58 (53.7%) are not having any other associated disease other than diabetes and 72 (66.67%) have poor glycaemic control followed by 44 (40.74%) history of smoking. (Table 1)

Among the 108 diabetic patients the knowledge on diabetic retinopathy is poor 12 (11.11%), average 53 (49.07%) and good 43 (39.81%). A total of 40 patients (37.04%) of patients were aware that diabetes can affect the eye, 64.81% patients are not aware that frequent screenings are required for diabetic retinopathy and 15.79% had never got screened. (Table 2)

In this study Out of the 108 diabetic patients 65 (60.19%) suffering with different severity of retinopathy 43.52% patients had NPDR, 16.67% patients had PDR and 39.81% had no indication of retinopathy. (Table 3)

Of the 65 patients who had signs of diabetic retinopathy there is statistical association with diabetic retinopathy and age of the patients other significant factors are 36.36% have positive family history of diabetes, 50% with poor glycaemic control i.e. HbA1c >7-8%, 80.65% duration of diabetes >15 years, 65% had associated hypertension, 63.64% are smokers. (Table 4)

## DISCUSSION

In this study, the prevalence of diabetic retinopathy was 60.9%. Similar studies conducted by Giri et al.,<sup>9</sup> Gunnlaugsdottir et al.,<sup>10</sup> Aggarwal et al.,<sup>11</sup> Zhang et al.,<sup>12</sup> Javadi et al.,<sup>13</sup> revealed that the prevalence of diabetic retinopathy were 44.4%, 37%, 28.9%, 28.5%, and 27%, respectively where the results are slightly higher in this study.

It was found that diabetic retinopathy was higher among the males 62.16% but statistically there is no significant association between gender and diabetic retinopathy  $P=0.5358$ . Similar studies conducted by Zhang et al.,<sup>12</sup> Maskari et al.,<sup>14</sup> found that diabetic retinopathy was slightly more prevalent among men than women i.e. 31.6%, 24.2% respectively.

In this study significant association was observed between age of the patient and diabetic retinopathy  $p<0.000$ . Similar association is observed and reported by Mani K et al.,<sup>15</sup>

A percentage of 37.04% patients were only aware that diabetes can affect the eye the results are comparable with the studies conducted by Hussain R et al.,<sup>16</sup> 40.7% Srinivasan et al.,<sup>17</sup> 42%, Rani et al.,<sup>18</sup> 49.9%. 64.81% patients are not aware that frequent screenings are required for diabetic retinopathy. 15.79% had never got screened, the results of this study are in contrast with study done by Rani PK et al.,<sup>18</sup> 93.3% and Namperumalsamy et al.,<sup>19</sup> 80% about attitude for annual eye screenings. More than half of patients were unaware that frequent eye screenings are required for diabetic patients.

In the present study, majority 43.52% patients with diabetic retinopathy had NPDR (Non – Proliferative Diabetic Retinopathy) followed by 16.67% patients had PDR. Similar observation was seen in study conducted by Aggarwal et al.,<sup>11</sup> showed that 79.8% patients had NPDR, 14.6% patients had PDR and in study done by Javadi et al.,<sup>13</sup> 72.9% patients had NPDR, 27.1% patients had PDR and there is significant association between duration of diabetes and diabetic retinopathy  $P<0.00016$ . Epidemiological study conducted by Wisconsin on diabetic retinopathy (WESDR) estimated and reported that high prevalence of DR was associated with longer duration of diabetes.<sup>20</sup> studies conducted by Maskari et al.<sup>14</sup> and Raman et al.<sup>21</sup> also shows that longer duration of diabetes has greater risk of diabetic retinopathy followed by significant association between hypertension and diabetic retinopathy  $P < 0.0013$ . The study conducted by Maskari et al.<sup>14</sup> Klein R, Klein BEK and Moss SE's epidemiologic studies.<sup>22</sup> says that retinopathy was higher among patients with hypertension and smoking also played a significant role in causing diabetic retinopathy  $P < 0.0088$ , similar relationship between smoking and retinopathy was reported



by Zutphen study.<sup>23</sup>

### Limitations

Prevalence of diabetic retinopathy in different parts of India varies. This is attributed by the fact that in India, there are different ethnic and life-style variations with large geographic area. Prevalence of DR also varies in population-based and hospital-based studies. The diagnostic criteria for diabetes also differ between studies. Sample size of the study is small. Thus the results of this study are difficult to ascertain on large population.

### CONCLUSION

Retinopathy is strongly associated with patient's age, duration of diabetic illness, having positive family history for diabetes, poor glycaemia control along with associated hypertension and habit of smoking. Screening regularly to detect diabetic retinopathy is highly recommended because early detection can prevent blindness. Thereby we conclude, diabetic retinopathy is a disease of multifactorial relationship. Duration of diabetes mellitus is a major risk factor for diabetic retinopathy. As duration of diabetes mellitus increases the chance of developing diabetic retinopathy increases. This is a first study of its kind which assessed the awareness of DR and estimated the prevalence of DR in Telangana State, hospital based type 2 diabetic population. This study also created awareness among the patients about DR who were evaluated during the course of the study.

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