

## HOSPITAL BASED STUDY TO DETERMINE THE PREVALENCE OF DIABETIC RETINOPATHY IN TYPE 2 DIABETIC PATIENTS.

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### Abstract

**Aim:** to analyze the prevalence of diabetic retinopathy in type 2 diabetic patients.

**Materials and Methods:** present observational study was undertaken in the Department of Ophthalmology, Patna Medical College and Hospital, Patna, Bihar, India for the period of one year. Total 100 patients of type 2 Diabetes Mellitus were included and detailed history was obtained.

**Results:** Out of 100 diabetic patients 21 (21%) of them had diabetic retinopathy. Out of 21 diabetic patients with diabetic retinopathy 61.9% were male. The mean age reported was 58.16±4.81. **Conclusion:** This study highlights the prevalence and the demographic characteristics of diabetic retinopathy among diabetes mellitus patients in a tertiary care hospital of Bihar. Since, no such study has been done before in this region.

**Keywords:** Type 2 diabetes, Retinopathy, Bihar

### Introduction

Globally there was an estimated 19.4 million diabetes individuals in 1995 which is projected to increase to nearly 80 million in 2030.<sup>i</sup> The incidence of blindness is 25 times higher in patients with diabetes than in the general population. Diabetic eye disease is the leading cause of new blindness in people of working age group.<sup>ii</sup> Approximately 34.6% of persons with diabetes will develop any diabetic retinopathy and 10.2% will develop vision-threatening diabetic retinopathy.<sup>iii</sup>

India has been the first country in the world to initiate a public funded program for the control of blindness as a national priority health problem. With the launch of 'Vision 2020' global initiative, the focus has shifted to rapid assessment and management of all causes of avoidable blindness.<sup>iv</sup>

Most screening programs are a trade-off between the information meticulously gleaned by painstakingly complying with the recommended gold standard and diluting the process just enough to still maintain acceptable levels of diagnostic accuracy while optimizing coverage.<sup>v</sup>

The purpose of the study was to assess prevalence and factors for developing diabetic retinopathy among known diabetics; it also sought to identify lacunae in the current process of case detection to improve future screening programs.

### Materials and methods

The present observational study was undertaken in the Department of Ophthalmology, Patna Medical College and Hospital, Patna, Bihar, India for the period of one year. Total 100 patients of type 2 Diabetes Mellitus were included and detailed history was obtained.

### Inclusion criteria

1. Patients above 30 years of age
2. Patients pre-diagnosed with Diabetes (as per American Diabetes Association criteria)
3. Those who give informed consent

### Exclusion criteria

1. Those who not give informed consent
2. Patients presented with acute eye injury,
3. Previous surgeries like keratoplasty

### Ethical approval and Informed consent

The study protocol was reviewed by the Ethical Committee of the Hospital and granted ethical clearance. After explaining the purpose and details of the study, a written informed consent was obtained.

### Sample selection

The sample size was calculated using a prior type of power analysis by G\* Power Software Version 3.0.1.0 (Franz Faul, Universitat Kiel, Germany). The minimum sample size was calculated, following these input conditions: power of 0.80

and  $P \leq 0.05$  and sample size arrived were 94 participants. The final sample achieved was 100.

### Methodology

Standard techniques and equipment were used for clinical examination; retinal evaluation was done using a direct/indirect ophthalmoscope or 90D lens on slit lamp or by fundus photography. Diabetic Retinopathy is classified according to the Early Treatment of Diabetic Retinopathy Study (ETDRS) criteria.

### Statistical Analysis

The data was analyzed using SPSS 19 (SPSS Inc. Chicago, IL, USA) Windows software program. Descriptive frequencies were expressed using mean and standard deviation. Sensitivity and specificity were calculated with 95% confidence interval (CI) where relevant.

### Results

**Table 1:** prevalence of diabetic retinopathy in the screened population

Diabetic Retinopathy	N (%)
Present	21 (21%)
Absent	79 (79%)
Total	100 (100.0%)

**Table 2:** demographic and clinical profile of positive patients

Age (years)	58.16±4.81
Gender (M/F)	13 (61.9%) / 8 (38.1%)
Duration of diabetes	14.27±1.18

**Table 3:** type of diabetic retinopathy

Type of Diabetic Retinopathy	N (%)
Non-Proliferative Diabetic Retinopathy	15 (71.4%)
Proliferative Diabetic Retinopathy	6 (28.6%)
Total	21 (%)

### Discussion

Over the past decades, many studies have been conducted to ascertain the prevalence of diabetic retinopathy in the diabetic population in various regions of the country and world.

Prevalence of diabetic retinopathy reported in the present study was 21%. The previous studies calculate prevalence were by Raman et al.<sup>vi</sup> (18.1%), Rema et al.<sup>vii</sup> (17.6%), Namperumalsamy et al.<sup>viii</sup> (10.6%), Narendran et al.<sup>ix</sup> (26.2%) and Dandona et al.<sup>x</sup> (22.58%). Most of these studies were conducted in the southern states of the country. Few studies exist in the indexed literature to cover other parts of the country.

Studies performed across the globe reported varying rates of prevalence such as Lian et al.<sup>xi</sup> (39%) in Hong Kong,

Rodriguez-Poncelas et al.<sup>xii</sup> (12.3%) in Spain, Dawkins et al.<sup>xiii</sup> (18.6%) in Timor-Leste, Huang et al.<sup>xiv</sup> (33.9%) in Singapore, Giloyan et al.<sup>xv</sup> (36.2%) in Armenia, Hajar et al.<sup>xvi</sup> (27.8%) in Saudi Arabia, and Dutra Medeiros et al. (16.3%) in Portugal.<sup>xvii</sup>

Diabetic Retinopathy is predominantly classified into Nonproliferative Diabetic Retinopathy and proliferative Diabetic Retinopathy.<sup>xviii</sup>

Nonproliferative Diabetic Retinopathy was observed in 15 cases and proliferative Diabetic Retinopathy was reported in 6 cases.

Nonproliferative Diabetic Retinopathy is characterized by retinal small vessel occlusion and increased permeability due to loss of blood retinal barrier. Various fundus changes include microaneurysms, hemorrhages (superficial and dot blot hemorrhages), cotton wool spots, intraretinal microvascular abnormalities (IRMA) & venous beading.

In Proliferative Diabetic Retinopathy, neovascularisation and associated intra/ preretinal hemorrhages, scarring and retinal detachment occurs. Proliferations of new vessels occur in response to vasogenic factors released by ischaemic retina.

### Conclusion

This study highlights the prevalence and the demographic characteristics of diabetic retinopathy among diabetes mellitus patients in a tertiary care hospital of Bihar. Since, no such study has been done before in this region. Hence the present study will play an integral role in raising awareness amongst the people about the ocular manifestations of the disease.

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