



CROSS SECTIONAL STUDY OF PREVALENCE OF DIABETIC RETINOPATHY IN POPULATION OLDER THAN 40 YEARS AGE IN A TERTIARY CARE CENTRE.

Ophthalmology

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ABSTRACT

Background: The study will help us to ascertain the burden on the health services as well as the need to conduct screening program and diabetic education program at grass root level for Diabetes Mellitus patients.

Aims: To Determine the prevalence of Diabetic Retinopathy in population older than 40 years of age in a tertiary care centre.

Methods: The first 222 subjects with the diagnosis of Type 2 Diabetes Mellitus meeting the eligibility requirements were recruited.

Results: This study showed the following prevalence of diabetic retinopathy 87 (39.18%) patients had Diabetic Retinopathy. Out of 87 patients with DR, 58 (26.12%) patients had NPDR and 29 (13.06%) patients had PDR. Prevalence of CSME was found to be 7.02%.

Conclusions: The study highlighted that timely diagnosis is critical in order to prevent serious complications such as Vision Threatening Diabetic Retinopathy and Clinically Significant Macular Edema.

KEYWORDS

Diabetes complications, diabetic retinopathy, health facilities, Screening.

INTRODUCTION:

As per World Health Organization (WHO), India has around 31.7 million diabetes patients and this number is expected to increase to 79.4 million by 2030.^[1] The increase in prevalence of Diabetes mellitus (DM) in India emphasises the need to conduct epidemiologic studies on Diabetes-related complications among Type 2 diabetic Mellitus population.^[2] It is shown to cause visual impairment in more than 86% of type 1 diabetic mellitus patients and in 33% of type 2 diabetic mellitus patients.^[3,4]

It is seen that nearly all type of type 1 Diabetes Mellitus patients and 75% type 2 patients with Diabetes Mellitus develop Diabetic Retinopathy within 15 to 20 years of being diagnosed as having Diabetes Mellitus.^[5] Type 2 Diabetes Mellitus (T2DM) has been linked to chronic hyperglycemia due to insulin resistance.^[6] The incidence rates of Type 2 Diabetes Mellitus has increased alarmingly predicting the occurrence of more than 200 million type 2 diabetes cases in the next decade by WHO.^[7] The chances of developing Diabetic Retinopathy increases with age and HbA1c values.^[8] It is also a well-known fact that the retinopathy often goes unnoticed until vision loss occurs, hence early detection, timely treatment and appropriate care can protect or delay the loss of vision.^[9]

Subjects and Methods:

The study was an analytical (observational) hospital based, cross sectional study conducted in the outpatient department of Ophthalmology, of a tertiary care hospital. The total duration of the study was two years (Nov. 2017-2019) which included screening, recruitment of participant and data analysis. Inclusion Criteria were diagnosed patients of Type 2 Diabetes Mellitus of either gender and age above 40 years who have not received any ophthalmic treatment for the same and with Nuclear Sclerosis upto Grade 2. A detailed ocular and systemic history was taken. Patients enrolled in this study underwent a comprehensive ophthalmologic examination after the anterior segment evaluation, each patient was instilled with a drop of 1% tropicamide and 2.5% phenylephrine hydrochloride in each eye 3 times at 15-minute intervals to dilate the pupil for detailed fundus and slit lamp examination and Optical Coherence topography to rule out Clinically significant macular edema. Prevalence of Diabetic Retinopathy was calculated as the ratio of the number of participants with Diabetic Retinopathy in one or both eyes to the total number of diabetic patients who were evaluated.

RESULTS:

Table 1 shows the prevalence of Diabetic Retinopathy (DR). Out of 222 patients who were studied, 87 patients had Diabetic Retinopathy. Out of 87 patients with DR, 58 patients had NPDR and 29 patients had PDR.

Total no of patients	Percentage of patients with DR (Total)	Percentage of patients with NPDR	Percentage of patients with PDR
222	87(39.18%)	58(26.12%)	29 (13.06%)

Following graphs shows the age wise analysis of prevalence and severity of Diabetic Retinopathy in population with type 2 Diabetes Mellitus

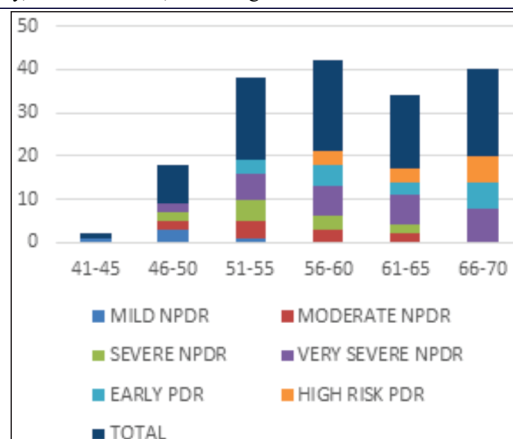
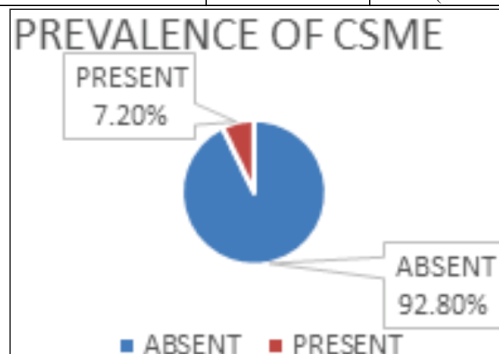


Table 2 shows the prevalence of CSME with duration of diabetes

Duration of NIDDM in years	Total no of patients	% of patients with CSME
0-5	35	00
6-10	41	00
11-15	43	02 (5.88%)
16-20	37	03 (8.10%)
21-25	35	05 (11.42%)
>25	31	06 (19.35%)



DISCUSSION:

Diabetic retinopathy is one of the most severe microvascular complications in patients with Diabetes and is a leading cause of irreversible loss of vision in working-aged adults.^[10] The high prevalence of Diabetic Retinopathy in Type 2 Diabetic patients imposes a large economic burden. Severity of hyperglycemia and duration of diabetes mellitus are widely recognized as major risk factors for the development of Diabetic Retinopathy. This study was conducted on 222 patients with Type 2 Diabetes Mellitus. The present

hospital – based, cross-sectional study showed the following prevalence of diabetic retinopathy 87(39.18%) patients had Diabetic Retinopathy. Out of 87 patients with DR, 58(26.12%) patients had NPDR and 29 (13.06%) patients had PDR. Prevalence of CSME was found to be 7.02%. Overall, prevalence of Diabetic Retinopathy in hospital-based studies^[11,12] including present study was higher as compared to those in population based epidemiological studies. This observation may be attributed to the fact that there was a referral bias among the diabetic patients who were reported to tertiary care centers. Hence, with larger number of diabetics and with higher diabetic ages reporting to the diabetic clinic, it is more likely that prevalence of complications may also be larger. In a recent, population based, cross – sectional study which was done at Chennai on urban diabetic population an 18% prevalence of DR was observed^[13]. It further strengthens referral biased differences in hospital and population-based studies. Several studies from the world and from India have also tried to find out prevalence of different complications of DM. The table given below has compared the prevalence of diabetic retinopathy, including its stages NPDR and PDR, in different populations from south, north and western India.

STUDY AND AUTHORS	YEAR	TOTAL NO OF CASES	%DR,%NPDR AND %PDR
PRESENT STUDY	2019	222	39.18%,26.12%,13.06%
Rema M et al	1996	6792	34.1%,30.8%,3.4%
Agrawal R P et al	2000	4067	28.9%,23.06%,5.9%
Narendran V et al	2002	260	26.2%,24.65,1.6%
Rema M et al CURES Eye Study	2005	1382	17.6%,16.6%,0.9%
Maresh G et al	2005	323	20.12%,10.84%
Ramavat PR,Ramavat MR,Ghugare BW	2009	168	33.92%,25.59%,8.33%

Our study results were comparable to the study conducted in 2009 by Ramvat PR which was also a hospital based city with their results showing overall prevalence of DR (33.92%) Even NPDR was more prevalent as compared to PDR just like in other studies done in South India. This may further suggest that the possibility of differences in the prevalence of Diabetic Retinopathy may be non-existent among Type 2 diabetic patients of different geographical origins and ethnic groups, however the possibility may be explored by doing larger population based studies across the country. We observed the duration of diabetes to be related with the development of Diabetic Retinopathy and the percentage of patients affected with DR increases with the increasing duration of Type 2 Diabetes Mellitus. This is further strengthened by the fact that duration of diabetes was the single most common predictor which affected severity of DR.

Also, it was seen that there is an increase in severity of DR as age of diabetics advanced. According to our findings, DR may appear as early as 0-5 years of having diabetes and more than 90% of patients develop DR after 25 years of having the disease. PDR was seen after 11 years of having diabetes and after 25 years of having it, 100% cases were in severe stages of DR. Prevalence of CSME increased with increasing age of diabetics. Similar observations were evident in studies which were done in the past^[14,15,16]. Our study supported this fact.

Limitations:

1. The study was based upon patients and observations from a single tertiary care centre, which makes it of limited use to extrapolate its data to the entire population
2. A sample size of 222 subjects in the study cannot accurately represent the trends in the entire population.
3. The patients in the study were cases of Type 2 Diabetes Mellitus who were already under systemic treatment for the same, which would act as a confounding factor, as it itself influences the severity of Diabetic Retinopathy.
4. The study was a cross sectional study and hence could not evaluate the longitudinal trends in the disease activity, which can be

better correlated with the patients' HbA1c levels.

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