

## Prevalence of Diabetic Retinopathy in Diabetes Mellitus Patients in Bhuj, Kutch

Jitendra Pareek<sup>1</sup>, Kashyap Buch<sup>2</sup>

### Author's Affiliation:

<sup>1</sup>Assistant Professor <sup>2</sup>Associate Professor Department of Medicine, Gujarat Adani Institute of Medical Science, Bhuj, Gujarat 370001, India.

### Corresponding Author:

**Kashyap Buch**, Associate Professor, Department of Medicine, Gujarat Adani Institute of Medical Science, Bhuj, Gujarat 370001, India.

**E-mail:** [researchguide86@gmail.com](mailto:researchguide86@gmail.com)

**Received on** 27.07.2018,

**Accepted on** 31.08.2018

### Abstract

*Background and Aim:* With the intention of ascertaining the magnitude of the problem and to generate awareness, the All India Ophthalmological Society (AIOS), in 2014, took an initiative to detect the presence of DR among persons with diabetes in eye clinics across the length and breadth of the country. Hence the present study was undertaken with the aim to calculate the frequency of DR in patients with diabetes mellitus. *Materials & Methods:* A total of 400 individuals were included in the study. All the patients were suffering from diabetes or were newly diagnosed case of diabetes that had come for the screening of diabetic retinopathy. The patients in whom the posterior segment was not visualized were excluded from the study. *Results:* Total of 200 patients were diagnosed with diabetic retinopathy. It means that 50% patients were diagnosed with diabetic retinopathy. Out of the total 200 patients diagnosed with diabetic retinopathy, 55 patients were suffering from proliferative diabetic retinopathy and rest of 145 patients were diagnosed with non proliferative diabetic retinopathy. *Conclusion:* The presence of diabetic retinopathy is found to be minimal in less than 5 years of diabetes age. It is more in patients having diabetes of duration 20-25 years and in all patients with duration of diabetes more than 25 years. PDR was found to be present more in patients having DM of longer duration.

**Keywords:** Diabetes Mellitus; Retinopathy; Prevalence; Gujarat

### Introduction

Diabetes mellitus is increasing dramatically throughout the world. It is estimated that, for 2010, diabetes mellitus affects 285 million adult people globally, including 17.9 million in the Central and South America region. India is set to emerge as the diabetic capital of the world [1]. According to the WHO, 31.7 million people were affected by diabetes mellitus (DM) in India in the year 2000. This figure is estimated to rise to 79.4 million by 2030, the largest number in any nation in the world [2, 3].

Diabetic retinopathy (DR), a specific vascular complication of diabetes, is the leading cause of blindness in working age individuals in developed countries. The World Health Organization estimates that DR is responsible for 4.8% of the 37 million cases of blindness throughout the world.

The prevalence of DR increases with the duration of diabetes; nearly all persons with type 1 diabetes and more than 60% of those with type 2 diabetes have some retinopathy after 20 years [4,5].

Long standing DM is associated with macro- and micro-vasculature abnormalities, pathological changes of neurons, skin, blood vessels and lens leading to hypertension, end stage renal failure, blindness and neuropathies. The degree of hyperglycemia and duration of diabetes are often linked with the development of these complications [6]. Diabetes remains leading cause of visual impairment in Western and Asian countries in population under 60 years of age. Patients with DR are 25 times more likely to become blind than non-diabetics. The rate of DR in DM is 4% whereas in DM II it is 1.6%. Prevention and progression of the complication can be minimized by timely

diagnosis and strict glycemic and blood pressure control [7].

Almost two-third of all Type 2 and almost all Type 1 diabetics are expected to develop diabetic retinopathy (DR) over a period of time. With the intention of ascertaining the magnitude of the problem and to generate awareness, the All India Ophthalmological Society (AIOS), in 2014, took an initiative to detect the presence of DR among persons with diabetes in eye clinics across the length and breadth of the country. Hence, the present study was undertaken with the aim to calculate the frequency of DR in patients with diabetes mellitus.

### Materials and Methods

The present study was conducted in the medical college in Gujarat. All the participants were informed about the procedure of the study and informed consent was signed by them. once the informed consent was obtained than only the individuals were included in the study. A total of 400 individuals were included in the study. All the patients were suffering from diabetes or were newly diagnosed case of diabetes that had come for the screening of diabetic retinopathy. The patients in whom the posterior segment was not visualized were excluded from the study.

First step was to take the record of the history of the patients. The parameters included time of onset of the diabetic mellitus, treatment undertaken for diabetes mellitus, duration of the diseases, presence of any specific systemic illness and diseases and o=any other ocular treatment undertaken. Next was the full visual examination of the patients. Snellen's distant vision chart was used to measure the visual acuity, for Lids we used the Jaeger's near examination, detailed examination was done for corena, iris, anterior segment and lens was done by slit lamp bio microscope. In case

of occludale anterior chamber angle or shallow anterior chamber; Gonioscopy was performed. Neovascularization of the anterior chamber was looked while performing the Gonioscopy.

Severity of maculopathy and severity of retinopathy was noted. Any evidence of hypertensive retinopathy, branch retinal vein occlusion, central retinal vein occlusion, age-related macular degeneration, macular scar was noted. Fundus fluoroscein angiography was done after taking a written informed consent. All patients were investigated for blood sugar levels, urine sugar levels and HbA1 C, blood urea, creatinine, cholesterol, and serum triglyceride Grading of DR was done by the ETDRS grading system. After complete evaluation, the patient was counselled and appropriate treatment was advised.

### Results

Total of 400 patients were included in the study. All the patients were suffering from diabetes mellitus with the range from 1 to 30 years. The age of the individual vary from 30 to 80 years. The mean age of the patients with diabetic retinopathy was found to be 60 years whereas the mean age of the patients without diabetic retinopathy was found to be 50 years. Direct association was obtained between the diabetic retinopathy and duration of diabetes (Table 1).

Total of 200 patients were diagnosed with diabetic retinopathy. It means that 50% patients were diagnosed with diabetic retinopathy. Out of the total 200 patients diagnosed with diabetic retinopathy, 55 patients were suffering from proliferative diabetic retinopathy and rest of 145 patients were diagnosed with non proliferative diabetic retinopathy. In the table 2 we have narrated the correlation between the HbA1C and diabetic retinopathy.

**Table 1:** Duration of diabetes mellitus and its association with diabetic retinopathy

Duration of Diabetes (years)	No. of patients	Diabetic Retinopathy	Percentage	Z value
0-5	100	28	16	10.29
6-10	95	40	42.10	0.31
11-15	60	50	83.33	4.12
16-20	50	37	74	3.19
20-25	45	30	66.66	6.04
> 25	50	15	30	infinity

**Table 2:** Association between diabetic retinopathy and HbA1C

HbA1C	Proliferative Diabetic Retinopathy	Non proliferative Diabetic Retinopathy
< 6.5	7	20
6.5 – 7.5	9	31
7.5-8.5	7	21
8.5-9.5	6	23
9.5-10.5	8	29
10.5-11.5	5	18
>11.5	4	13
Total	45	155

## Discussion

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 [8].

Prevalence of diabetic retinopathy in different parts of India varies. This is can be attributed to the fact that in India, there is a wide geographical, ethnic and life-style variation. Prevalence of DR also varies in population based and hospital-based studies [9]. The diagnostic criteria for diabetes also differ between studies and reports are based on self-reported diabetes, fasting blood sugar and/or oral glucose tolerance test. Few studies have used retinal photography as screening tools [10].

Diabetes is the 4th leading cause of death in most developed countries with major burden of diabetes and if the current situation continues. Diabetic retinopathy is the most common cause of blindness in the working age group. It is one of the few ophthalmic diseases where there is a role of preventive measure to delay the progression of disease and visual loss [11].

In our study, NPDR is seen in 71.88% and PDR is seen in 28.12%. It does not corroborate with the previous study done by Narendran et al. In our study we have more patients presenting with PDR. This may be due to the reason that patients with longer duration of diabetes are more in our study. The Z values for duration of diabetes 0–5 years is 10.29 and for 5–10 years is 0.31 which are found to be insignificant. Z values have been found to be 4.12 for duration of 10–15 years, 3.19 for 15–20 years, 6.04 for 20–25 years which are found to be significant. Hence, in all the patients having DM of 10 years or longer duration should be screened for DR. Z values in patients having diabetes more

than 25 years is found to be infinity hence there is high likelihood of all patients of more than 25 years of diabetes to have DR

This study shows an increasing prevalence of DR with increasing duration of diabetes. In our study also we have a 62% prevalence of DR with duration of DM of 16–20 years, but higher prevalence in 20–25 years duration of DM and retinopathy was found to be maximum in patients with diabetes of more than 25 years.

## Conclusion

The presence of diabetic retinopathy is found to be minimal in less than 5 years of diabetes age. It is more in patients having diabetes of duration 20–25 years and in all patients with duration of diabetes more than 25 years. PDR was found to be present more in patients having DM of longer duration.

*Sources of funding:* Nil.

*Conflict of interest:* None declared

## References

1. Zimmet P: The burden of type 2 diabetes: are we doing enough? *Diabetes & metabolism* 2003, 29:659-6S18.
2. Rema M, Premkumar S, Anitha B, Deepa R, Pradeepa R, Mohan V: Prevalence of diabetic retinopathy in urban India: the Chennai Urban Rural Epidemiology Study (CURES) eye study, I. *Investigative ophthalmology & visual science* 2005, 46:2328-33.
3. Zafar J, Bhatti F, Akhtar N, Rasheed U, Bashir R, Humayun S, Waheed A, Younus F, Nazar M: Prevalence and risk factors for diabetes mellitus in a selected urban population of a city in Punjab. *JPMA-Journal of the Pakistan Medical Association* 2011;61:40.

4. Villena JE, Yoshiyama CA, Sánchez JE, Hilario NL, Merin LM: Prevalence of diabetic retinopathy in Peruvian patients with type 2 diabetes: results of a hospital-based retinal telescreening program. *Revista Panamericana de Salud Pública* 2011;30:408-14.
  5. Ruta L, Magliano D, Lemesurier R, Taylor H, Zimmet P, Shaw J. Prevalence of diabetic retinopathy in Type 2 diabetes in developing and developed countries. *Diabetic medicine* 2013;30:387-98.
  6. Strycharz J, Rygielska Z, Swiderska E, Drzewoski J, Szemraj J, Szmigiero L, Sliwinska A: SIRT1 as a therapeutic target in diabetic complications. *Current medicinal chemistry* 2018;25:1002-35.
  7. Ishaq H, Ali M, Kazmi N, Naqvi BS, Shaikh D. Prevalence of diabetic retinopathy in type II diabetic patients in a health facility in Karachi, Pakistan. *Tropical Journal of Pharmaceutical Research* 2016;15:1069-76.
  8. Mohan V, Pradeepa R. Epidemiology of Diabetes in Different Regions of India. *Health administrator* 2009;22:1-18.
  9. Soltesz G, Patterson C, Dahlquist G, Group ES. Worldwide childhood type 1 diabetes incidence-what can we learn from epidemiology? *Pediatric diabetes* 2007;8:6-14.
  10. Fujimoto WY, Leonetti DL, Kinyoun JL, Newell-Morris L, Shuman WP, Stolov WC, Wahl PW. Prevalence of diabetes mellitus and impaired glucose tolerance among second-generation Japanese-American men. *Diabetes* 1987;36:721-9.
  11. Amos AF, McCarty DJ, Zimmet P. The rising global burden of diabetes and its complications: estimates and projections to the year 2010. *Diabetic medicine* 1997;14:S7-S85.
-