JMSCR Vol||04||Issue||12||Page 14903-14908||December 2016

www.jmscr.igmpublication.org
Impact Factor 5.244
Index Copernicus Value: 83.27
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v4i12.97

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Prevalence of various stages of Diabetic Retinopathy in patients of Diabetes Mellitus-Type 2

Authors
Prof Pragati Garg[1], Dr Lubna Ahmad[2]
Corresponding Author
Dr Lubna Ahmad
Room no.15, 4th floor, PM Apartments, Sarfarazganj, Hardoi Road, 226003, Lucknow
Email- *lubbs.ahmad@gmail.com*

Abstract

Introduction: *Diabetic eye disease is a leading cause of vision loss in persons aged 20 to 74 years[1]. Diabetes has many manifestations in the eye, of which cataracts and Diabetic Retinopathy (DR) are the most significant cause of visual impairment and blindness, and people with diabetes are 25 times more likely than the general population to become blind[2]. Diabetic retinopathy is the most common microvascular complication of diabetes[3]. It is a progressive disease predominantly affecting the integrity of the microscopic vessels found in the retina. DR can be broadly divided into two clinical stages: non- proliferative diabetic retinopathy (NPDR)and proliferative diabetic retinopathy (PDR).*

Materials and Methods: *It was a observational, cross sectional study. 200 cases of Diabetes aged ≥30 Years, attending the ophthalmology OPD with their informed written consent were included in the study. In all the patients clinical examination included assessment of Visual acuity, slit lamp examination, fundus examination with +90 D lens, applanation tonometry, direct and indirect ophthalmoscopy, Stereoscopic 30^0 macula centered photograph (by carl zeiss-fundus camera).*

Result: *Out of 200 patients of diabetes who were analysed, diabetic retinopathy was commonly seen in the age group of 50-70 years and in men. Most common type of retinopathy was moderate NPDR (non-proliferative diabetic retinopathy). It was found to be slightly more common in Muslims as compared to Hindus.*

Conclusion: *Prevalence of diabetic retinopathy is significantly higher in men (68.5%) (p=0.016) than in women and in those who were 50-70years of age (75.5%) (p<0.001). It is slightly more common in Hindus than in Muslims .Most of the diabetic retinopathy (85.8%) was of the non- proliferative type.*

Keywords: *Diabetic retinopathy , diabetes ,prevalence.*

Introduction

Today diabetes is considered to be one of the most common non-communicable disease globally. Diabetes mellitus is classified on the basis of aetiology and clinical presentation of the disorder into four types: type 1 diabetes, type 2 diabetes, gestational diabetes, and other specific types[4,5]. Type 2 diabetes constitutes about 85 to 95% of all diabetics in high-income countries[6] and accounts for an even higher percentage in low- and middle-income countries. Diabetes can lead to both macrovascular complications like coronary artery disease, peripheral arterial disease, and stroke and microvascular complications like diabetic

retinopathy nephropathy and neuropathy. High levels of blood sugar circulating in blood is a characteristic feature of diabetes and is responsible for the microvascular changes. Diabetic retinopathy is amongst the commonest microvascular complication of diabetes. The risk of developing diabetic retinopathy or other microvascular complications of diabetes depends on both the duration and the severity of hyperglycemia. Retinopathy may begin to develop as early as 7 years before the diagnosis of diabetes in patients with type 2 diabetes[7]. It is important to identify individuals who are developing diabetes at an early age, as the risk factor intervention might reduce the risk of complications. A recent estimate of the prevalence of diabetic retinopathyin the United States showed a high prevalence of 28.5% among those with diabetes aged 40 years and older.[8] According to a study conducted by Pinto-Figueiredo L et al the data resulting from the first ophthalmological observation of 1,302 insulin dependent diabetics whose age at diagnosis is less than 30 years the prevalence of retinopathy is 41, 6%; 34.3% is non-proliferative and 7.3% is proliferative9. Retinopathy is more frequent in males (P < 0.001).

The prevalence of retinopathy increases with the duration of diabetes and it is equal to or greater than 80% in people who have had diabetes for 10 years or more.

Materials and Methods

This was an observational, cross sectional study conducted at Tertiary Medical College in North India. This study was conducted in accordance with the tenets of the Declaration of Helsinki and was approved by an institutional review board. 200 cases of Diabetes aged ≥30 Years attending the ophthalmology OPD with their informed written consent were included in the study. Patients with advanced lens opacities, prior ocular surgeries, H/O laser treatments &Age related macular degeneration (ARMD) were excluded from the study.

In all the patients clinical examination included assessment of Visual acuity by Snellen's chart, slit lamp examination, fundus examination with +90 D lens, IOP measurement by applanation tonometer, direct and indirect ophthalmoscopy and Stereoscopic 30^0 macula centered photograph (by carl zeiss –fundus camera).Statistical analysis was done using Statistical Package for Social Sciences, version 20.0.

Result

200 patients of Diabetes Mellitus type 2 were evaluated, among which males were 130(65%) and 70(35%) were females. The prevalence was higher in men than women which was statistically significant (p=0.016). 97(48.5%) patients of diabetes were of hindu religion and 103(51.5%) patients were muslim. Out of the 200 patients 35(17.5%) diabetic patients were between the age group of 30-50, 140(70%) between 50-70 and 25(12.5%)>70 yrs.

Diabetic retinopathy was present in 126 patients (63%), 55.4% of the patients had diabetic retinopathy in the age group of 30-50, 75.5% in the age group of 50-70 and 32% in the age group of >70 yrs. Diabetic retinopathy was significantly most common in the age group of 50-70yrs(p value<0.001). On comparing the various age groups the risk of increasing severity of diabetic retinopathy was found to be significantly more in people aged >70 years (p value = 0.043).54.5% patients had NPDR and 9% patients had PDR and 36.5% had no retinopathy. Maximum number of patients n= (34%) were having moderate NPDR.

We found no religious discrimination as diabetic retinopathy was present in 61(62.9%) hindu patients and 65 (63.1%) muslim patients. Although the prevalence was found to be slightly more common in Muslims but it was statistically insignificant (p=0.905).

Although diabetes was more commonly seen in males but the risk of developing diabetic retinopathy is significantly more in females (p value=0.022)

Discussion

Diabetic retinopathy is a common complication of diabetes and is the leading cause of visual loss. According to the World Health Organization, India will become one of the major hubs of diabetic population during the next 2 decades. Chennai Urban Rural Epidemiology Study (CURES) reported the prevalence of DR in urban Chennai to be 17.6% in diabetic population. The prevalence of diabetic retinopathy in our study was 63%,which is much higher compared to other groups .Studies conducted by Aggarwal*et al*., [10]Zhang *et al*.,[11] Maskari*et al*., [12] Raman *et al*., [13] Javadi*et al*.,[14] and Gunnlaugsdottir *et al*., [15] revealed that the prevalence of diabetic retinopathy to be 28.9%, 28.5%, 19%, 18%, 37%, and 27%, respectively. The differences may be attributed to the fact that in the present study we examined only those patients of diabetes who attended the ophthalmology OPD for some complain or the other .

However in a population-based study in southern Wisconsin out of 1,370 patients of diabetes the prevalence of diabetic retinopathy was 77.8% but they all had diabetes for 15 or more years.[17]Also in a study done by Donald S[18]>60% of patients with type 2 diabetes had retinopathy .

Diabetic retinopathy was higher among males (65%) and more in muslims (63.1%) in our study. Similarly in a study conducted by Purushottam A et.al[16] it was found that diabetic retinopathy was higher among the males (64.10%), elderly patients, and those having longer duration of diabetic mellitus . Similarly, studies conducted by Zhang *et al*., [11] Maskari *et al*., [12] and Raman *et al*. [13] also found that diabetic retinopathy was slightly more prevalent among men than women i.e. 31.6%, 24.2%, and 23.9%, respectively.

In the current study of the 63 % of diabetics having diabetic retinopathy majority 54.9% of patients had NPDR, 9% of patients had PDR & the majority 34% of patients suffering from NPDR had moderate NPDR. In a study conducted by Aggarwal*et al*. [10] showed that 79.8% of DR patients had NPDR, 14.6% patients had PDR, and 5.8% patients had maculopathy. In study conducted by Javadi *et al*., [14] 72.9% patients had NPDR, 27.1% patients had PDR, and 15.8% patients had CSME. Another study conducted by Gunnlaugsdottir *et al*. [15] revealed that 92.75% patients had NPDR, 3.6% patients had PDR and 3.6% had CSME.

The findings of the present study provides an insight regarding an interrelationship between diabetes , diabetic retinopathy and its stages .Type 2 diabetes leading to diabetic retinopathy is largely affected by lifestyle and level of glycemic control thus highlighting the requirement for prevention with a good compliance to diabetic treatment, lifestyle modification and regular diabetic care.

The highlights of this study was the difference in the prevalence of DR between Hindus and Muslims, though it was insignificant we found no other study regarding this association. So we suggest more studies should be done to look for association of development of DR with various religions.

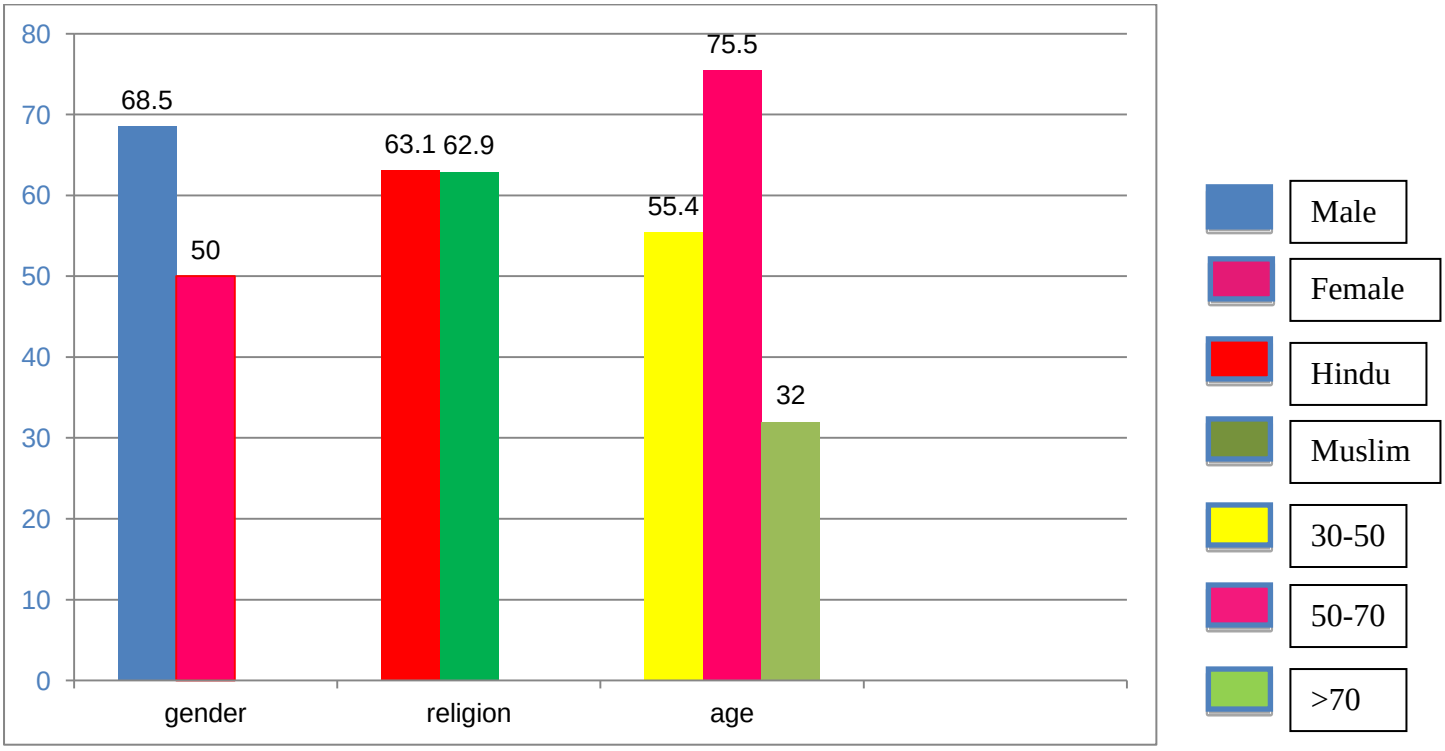
Observations

Demographic Distribution of Diabetic Patients

(n = 200 diabetic patients)

Age* (years)	No. of patients
30–50	35
50–70	140
>70	25
Male : Female	1.8
Muslim : Hindu	1.06

Diabetic Retinopathy Vs Demographic Variables



Status of Diabetic Retinopathy

		TYPES OF DR						
		NPDR				PDR		
PRESENT	63%	V.Mild	Mild	Mod.	Sev.	Mild -mod	High risk	ADD
		5.5%	9.5%	34%	4.5%	6.5%	1-5%	1%
ABSENT	37%	-				-		

Age Vs Severity of Diabetic Retinopathy

AGE	NPDR				PDR		
	V.Mild	Mild	Moderate	Severe	Mild-mod	High risk	ADD
30-50	0	1	2	8	3	1	0
50-70	2	10	16	56	10	1	1
>70	0	0	1	4	0	1	1

Association of Demographic Variables with Diabetic Retinopathy by Multiple Logistic Regression

	Odds ratio for having diabetic retinopathy	95% CI	
Age(years)		P Value	
30–50	.361	0.043	.134, .968
50-70	.149		.057, .391
> 70	Ref.		
Sex			
Male	.455	0.022	.232, .894
Female	Ref .		
Religion			
Hindu	1.001	0.997	.538,1.864
Muslim	Ref.		

As compared to age group of 30-50 years the risk of increasing severity diabetic retinopathy is significantly more in people aged >70 years (P value = 0.043)

With respect to males the risk is significantly more in females (p value=0.022)

There is no significant difference in the prevalence of DR with respect to Hinduism and islam (p value = 0.997) .

Acknowledgements

We thank the Ethical and Research committee of our Tertiary Medical College and Hospital for their approval and support in this survey. Mr Zeeshan's help with statistics was enormous.

Declarations

Funding: None

Conflict of interest: None declared

References

1. Resnikoff S, Pascolini D, Etya'ale D, et al. Global data on visual impairment in the year 2002. Bull World Health Organ. 2004; 82 (11):844–851.
2. National Society to Prevent Blindn-ess. Visual Problems in the US Data Analysis Definitions. Data Sources, Detailed Data Tables, Analysis, Interpretation. National Society to Prevent Blindness: New York, 1980, pp 1–46
3. Fong DS, Aiello LP, Ferris FL 3rd, Klein R: Diabetic retinopathy. Diabetes Care 2004; 27:2540–2553
4. Fowler MJ. Microvascular and Macrova-scular Complications of Diabetes. Clinical Diabetes 2008; 26(2): 77-82.
5. International Diabetes Federation (IDF). IDF Diabetes Atlas, Sixth Edition, 2013.
6. World Health Organization. Prevention of diabetes mellitus. Technical Report Series no. 844. Geneva: World Health Organiz-ation, 1994.
7. Fong DS, Aiello LP, Ferris FL 3rd, Klein R: Diabetic retinopathy. Diabetes Care 27:2540–2553, 2004

8. Zhang X, Saaddine JB, Chou CF, Cotch MF, Cheng YJ, Geiss LS, et al. Prevalenceof diabetic retinopathy in the United States,2005-2008. JAMA. Aug 11 2010;304:649-56.
9. Pinto-Figueiredo L et al. Diabetic retinopathy in a population of 1,302 insulin dependent diabetics (IDDM) diagnosed before 30 years of age. IntOphthalmol. 1992 Nov;16(6):429-37.
10. Aggarwal RP, Ranka M, Beniwal R, Gothwal SR, Jain GC, Kochar DK et al. Prevalence of diabetic retinopathy in type 2 diabetic in relation to risk factors: Hospital based study. Int J Diab Deb Ctries 2003;23(1):16-19
11. Zhang X, Saaddine JB, Chou CF, Cotch MF, Cheng YJ, Geiss LS, et al. Prevalence of diabetic retinopathy in United States. 2005-2008. JAMA 2010;304:649-56
12. Maskari FA, Sadig ME. Prevalence of diabetic retinopathy in United Arab Emirates: A cross sectional survey. BMC Ophthalmol 2007;7:11.
13. Rajiv Raman et al. Prevalence of diabetic retinopathy in India Ophthalmology . American academy of ophthalmology 2009;116:311-318
14. Javadi MA, Katibeh M, Rafati N, Dehghan MH, Zayeri F, Yaseri M, et al. Prevalence of diabetic retinopathy in Tehran province: A population based study. BMC Ophthalmol 2009;9:12
15. Gunnlaugsdottir E, Halldorsdottir S, Klein R, Eiriksdottir G, Klein BE, Benediktsson R, et al. Retinopathy in old persons with and without diabetes mellitus: The age, gene/ environment susceptibility – Reykjavik study (AGES-R). Diabetologia 2011;54:1298-303.
16. Giri PA, Bangal SV, Phalke DB. Prevalence of diabetic retinopathy and associated risk factors among diabetic patients attending Pravara Rural Hospital, Loni, Maharashtra. J Acad Med Sci 2012;2:64.