

Original Research Article

CORRELATION OF HBA1C WITH DIFFERENT GRADES OF DIABETIC RETINOPATHY

Comment [U1]: Glycated hemoglobin test (HbA1c)

ABSTRACT:

Diabetic retinopathy, is a disorder which generally affects the retina and disturbs the microvasulature of it and is the most dreaded complication of diabetes. This study included 50 patients with diabetic retinopathy, out of which 4% of patients infected with NPDR, 48% with mild and 20% with very high NPDR. 8% of cases had very severe NPDR while the rest 20% had PDR. Our results which showed a higher prevalence of CSME in patients with HBA1c of 8.7 % and above. From the finding the elevated lipid levels in serum are associated with high risk of CSME and retinal hard exudates.

Keywords:diabetic retinopathy,serum lipids

Comment [U2]: The articles are read by everyone not only by professionals, I suggest writing the meaning of each acronym and the example acronym in parentheses; non-proliferative diabetic retinopathy (NPDR)

INTRODUCTION:

Eye, an organ of vision and light perception, converts visible light into electro-chemical impulses to be handled by the brain. It functions like a camera with iris acting like a board up, regulating the amount

of light received by the eye and variable focussing & accommodation. The received light is focused by the lens through retina it passes through the optic nerve. The brain after receiving this information it process into an image which is understandable. The retina which is majorly involved in this process is affected in some diseased condition like DM and even causes blindness across the world. Case detection, therefore, requires active screening efforts. The prevalence of diabetes mellitus is growing rapidly worldwide and is reaching epidemic proportions. But this condition of vision loss is easily preventable if the glycemic level is under control. Cases increased with the increased time period of diabetes. One of the main difficulties in establishing whether there is a relationship between the degree of hyperglycemia and the long term complications of diabetes is the lack of a reliable and objective method for assessing diabetic control. Measurements of glycosylated proteins helps to assess the level of glycemia. Currently the most significant and widely used test in DM is monitoring the glycosylated Haemoglobin (HbA1C). But less studies have been done so far between HbA1C and different levels of diabetic retinopathy and this work aims to address this need.

METHODOLOGY:

Based on ETDRS criteria, patients were graded according to the severity of the diabetic retinopathy. Those with suspected CSME were confirmed by Optical Coherence Tomography (OCT). HbA1C levels were determined in all patients by Immunoturbidimetry method and statistical studies were performed accordingly.

Results

(i) Prevalence of Grade of diabetic retinopathy

Based on the observations made, NPDR had highest prevalence amounting to 80%, whereas PDR accounted to rest of 20% of the study population.

Figure 1 : Prevalence of Grade of diabetic retinopathy

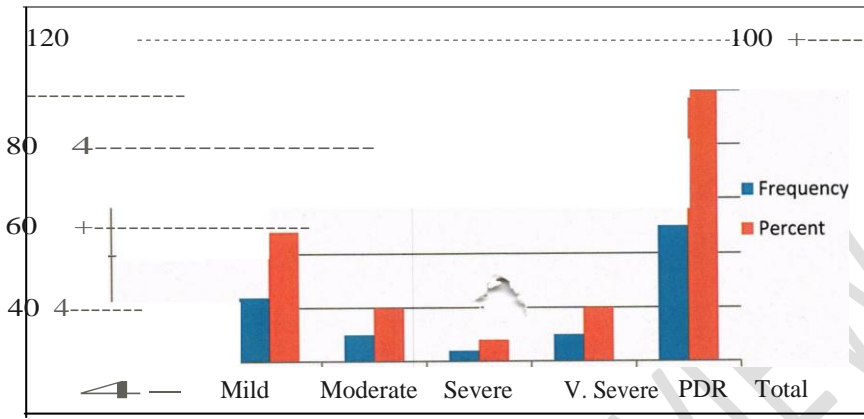


TABLE:1 Relationship between grades of diabetic retinopathy and hypertension

UNDER PEER REVIEW

Grades of Diabetic Retinopathy			Hypertension		Total	P value
			Yes	No		
Mild	Count	0	2	2	0.427	
	% within Diabetic Retinopathy	.0%	100.0%	100.0%		
	% within Hypertension	.0%	6.3%	4.0%		
	Moderate	Count	10	14		24
		% within Diabetic Retinopathy	41.7%	58.3%		100.0%
		% within Hypertension	55.6%	43.8%		48.0%
	Severe	Count	4	6		10
		% within Diabetic Retinopathy	40.0%	60.0%		100.0%
		% within Hypertension	22.2%	18.8%		20.0%
	Very Severe	Count	0	4		4
		% within Diabetic Retinopathy	.0%	100.0%		100.0%
		% within Hypertension	.0%	12.5%		8.0%
PDR	Count	4	6	10		
	% within Diabetic Retinopathy	40.0%	60.0%	100.0%		

		% within Hypertension	22.2%	18.8%	20.0%
Total		Count	18	32	50
		% within Diabetic Retinopathy	36.0%	64.0%	100.0%
		% within Hypertension	100.0%	100.0%	100.0%

Fig. 2. Relationship between grades of diabetic retinopathy and hypertension

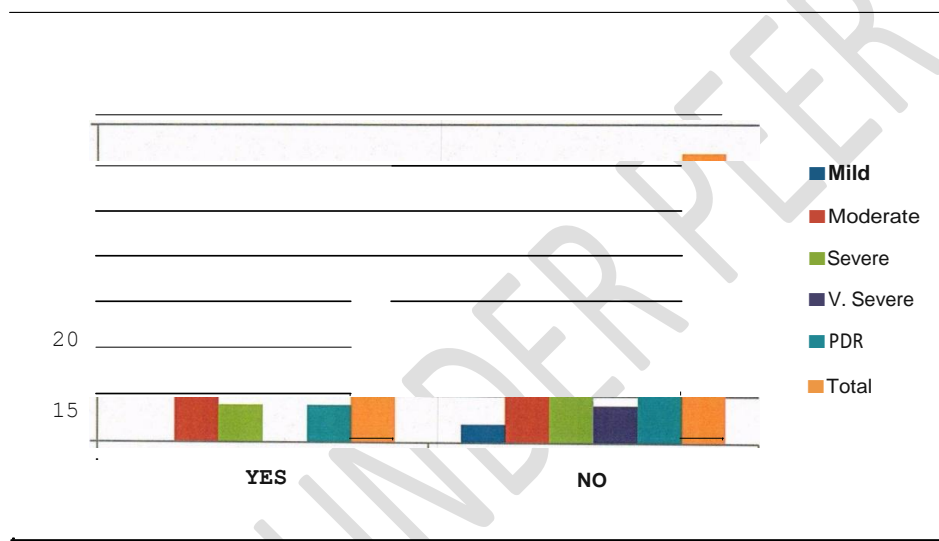
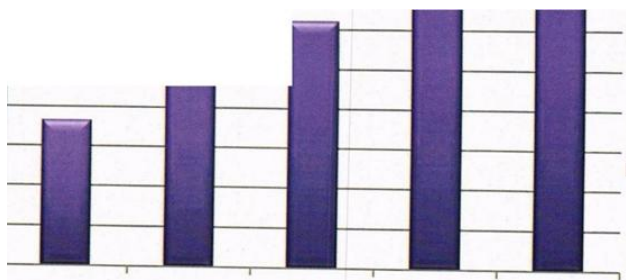


Figure 3 : Relationship between grades of diabeticretinopathy and hypertension

The relationship between diabetic retinopathy andhypertensives was not statistically significant. (p > 0.05)

(iii)Relationship between grades of diabetic retinopathy and HbA1C level



Mild NPDR Moderate NPDR Severe NPDR V. Severe NPDR PDR

Among mild NPDR the range of HbA1C was found > 7%, in moderate NPDR it was u : - ween 8% - 10%, those with severe and Very severe NPDR had HbA 1C ofbetween 12% - 14% and those with PDR had HbA1C

>13%. Higher the HbA1C, greater the severity ofretinopathy .

Discussion

Diabetic retinopathy, is the disorder that majorly affecting microvasculature of retina, is the most dreaded complication of diabetes. Therefore it IS very essential to identify the cases, who might be at high risk of severe retinopathy. Accurate clinical data is helpful in preventing its complications and are also help in performing studies such as controlled clinical trials of treatment of this disorder. This study involves 50 cases with diabetic retinopathy, out of which 4% of . Patients manifested with mild NPDR, 48% with mild and 20% with severe NPDR. 8% showed very severe NPDR while the remaining 20% had PDR. Chou T . H et al in their study stated that casess with the HBA1c value of 8 had an elevated macular thickening OCT in diabetic eyes and there was a good correlation statistically between younger age ,shorter diabetic duration and thicker macular thickness. Similar statistically significant results were obtained in this paper which showed a higher prevalence of CSME in patients with HBA 1c of 8.7 % and above. A better correlation was found between severity of Diabetic retinopathy with HbA 1C levels and those manifesting with higher HbA 1C had greater the severity of diabetic retinopathy.

Conclusion:

A statistically significant correlation was found between severity of Diabetic retinopathy with HbA 1C levels and those manifesting with higher HbA 1C had greater the severity of diabetic retinopathy. CSME had a

statistically significant correlation with severity of diabetic retinopathy , hyperlipidemia and HbA1C levels.

References

1. Diabetes mellitus : Pamela C. Champe, Richard A Harvey, Denise R. Ferrier : Lippincott's Illustrated Reviews: Biochemistry Awaters Kluwer Company, 3rd edition, 2005; 336 - 342.
2. M Rema, R Pradeepa (2000) Diabetic Retinopathy -An Indian Perspective. *Indian J*: 297-310.
3. Aiello LP, Gardner TW, King GL, Blankenship G, Cavallerano JD, Ferris FL 3rd , *et al* . Diabetic retinopathy. *Diabetes Care* 1998;21:143-56.
4. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetics, estimates for the year 2000 and projections for 2030. *Diabetes Care* 2004;27:104 7-1053 .
5. Klein R, Klein BE, Moss SE, *et al* . The Wisconsin Epidemiologic Study of Diabetic Retinopathy. II. Prevalence and risk of diabetic retinopathy when ageat diagnosis is less than 30 years. *Arch Ophthalmol* 1984;102:520-6.
6. Orchard TJ, Dorman JS, Maser RE, *et al* . Prevalence of complications in IDDM by sex and duration . Pittsburgh Epidemiology of Diabetic Complication Study II. *Diabetes*.1990;39:1116-1124.
7. Krishnamurthi U, Steffes MW. Glycohemoglobin: a primary predictor of the de velopme nt or reversal of complications of diabetes mellitus. *Clinical chemistry* 2001;47:1157-65.
8. Higgs PJ, Bunn HF. Kinetic analysis of the non enzymatic glycosylation of haemoglobin. *J Biol Chem* 1981;256: 5204 - 5208.
9. Verillo A: *et al* . Nunziata. V: *Diabetologia* [1983]: 24: 291.
10. Bolli. G. *et al* . *Diabetologia*. [1980]: 18: 125.
11. Gokhroo, R. K. *et al* Sethi. J. P. Bharadwaj. B. Mittal.
12. S.R. J.Asson Physician Indian. [1985]: 33: 478

Comment [U3]: VERY OLD
BIBLIOGRAPHY SERIOUS GOOD MORE
UPDATED OF THE LAST FIVE YEARS

Comment [U4]: VERY OLD
BIBLIOGRAPHY SERIOUS GOOD MORE
UPDATED OF THE LAST FIVE YEARS

Comment [U5]: VERY OLD
BIBLIOGRAPHY SERIOUS GOOD MORE
UPDATED OF THE LAST FIVE YEARS