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Original Research Paper

Ophthalmology

CORRELATION OF DIABETIC MACULOPATHY WITH THE STAGE OF DIABETIC RETINOPATHY

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ABSTRACT

Aim: To determine the prevalence of diabetic maculopathy, prevalence of the found type of maculopathy and correlation with the stage of diabetic retinopathy.

Materials and methods: This was a bidirectional observational cohort study of 100 cases (199 eyes with one single eyed) of type 2 Diabetes with diabetic retinopathy in atleast one eye conducted in Tirunelveli medical college and hospital. Stage of diabetic retinopathy according to Early Treatment Diabetic Retinopathy (ETDRS) grading system was done. Type of maculopathy was documented using fundus fluorescein angiography. Correlation of diabetic retinopathy with the stage of diabetic maculopathy was tested statistically.

Results: 49.61% of maculopathy patients had diabetes for less than 10 years. Diffuse maculopathy (63.57%) was the most common type of maculopathy followed by focal (27.91%), ischaemic (4.65%) and mixed (3.87%) maculopathy. Mixed type of maculopathy was common in the younger age group. Moderate NPDR and severe NPDR showed maximum proportion of patients with maculopathy.

Conclusion: The study demonstrated significant increase in diabetic maculopathy in the sixth decade. Diffuse maculopathy was the commonest irrespective of the stage of diabetic retinopathy.

KEYWORDS : diabetic maculopathy, macular edema, diabetic retinopathy

INTRODUCTION:

Diabetic retinopathy is a progressive disease predominantly affecting the integrity of microscopic vessels found in the retina. Abnormal capillary permeability results in leakage of fluid and solutes into the surrounding retinal tissue which collects around the macula which is referred to as macular edema and it poses a threat to vision loss[1]. Higher proportion of newly diagnosed type II diabetes have evidence of DR[2,3,4,5,6,7,8,9,10]. Prevalence of DR strongly correlates with duration of diabetes[1].

In addition to proliferative diabetic retinopathy, the most common cause of visual impairment is diabetic maculopathy and onset of macular edema[11]. Macular edema is found in about 10% of the diabetics with prevalence in the population of non-insulin dependent diabetic patients. It is the most common cause of decreased visual function in NPDR[12,13].

MATERIALS AND METHODS:

This was a bidirectional observational cohort study of 100 cases (199 eyes with one single eyed) of type 2 Diabetes with diabetic retinopathy in atleast one eye conducted in Tirunelveli medical college and hospital. Stage of diabetic retinopathy according to Early Treatment Diabetic Retinopathy (ETDRS) grading system was done. Type of maculopathy was documented using fundus fluorescein angiography. Correlation of diabetic retinopathy with the stage of diabetic maculopathy was tested statistically.

Source of data: Diabetic retinopathy patients who fulfill the inclusion and exclusion criteria attending the outpatient department at Tirunelveli medical college hospital during the study period.

Inclusion criteria: All patients with diabetic retinopathy

Exclusion criteria: i) Narrow angles ii) Media opacities which preclude fundus examination iii) Patients already treated for diabetic retinopathy.

Methodology:

Informed consent was obtained. Detailed history recorded regarding the age, duration of diabetes, treatment of diabetes, hypertension, dyslipidemia. Stage of diabetic retinopathy according to Early Treatment Diabetic Retinopathy Study (ETDRS) grading system. Type of maculopathy was documented using fundus fluorescein angiography. Correlation of diabetic maculopathy and diabetic retinopathy was tested statistically.

RESULTS:

A total of 100 patients with diabetic retinopathy in atleast one eye were recruited in the study out of which 68 were males and 32 were females. Out of 199 eyes studied with one patient being one eyed, 70 had no maculopathy. Among the 129 eyes with maculopathy, maximum proportion of maculopathy was in 51-60 years. Diffuse maculopathy was the most common maculopathy found in this study. All 5 eyes with mixed maculopathy were in 41-50 age group.

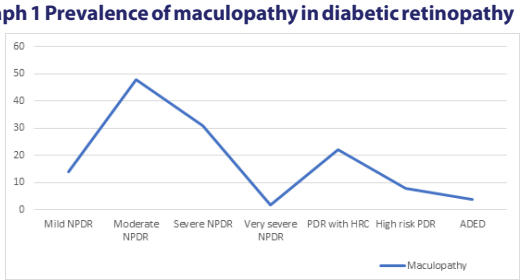
Table 1 Age Vs Maculopathy

Age group	Maculopathy					Total
	No Maculopathy	Focal	Diffuse	Ischaemic	Mixed	
41-50	21	3	7	4	5	40
51-60	29	17	55	2	0	103
61-70	15	11	16	0	0	42
71-80	5	5	4	0	0	14
Total	70	36	82	6	5	199

Table 2 Sex Vs Maculopathy

Sex Vs Maculopathy						
Sex	Maculopathy					Total
	No Maculopathy	Focal	Diffuse	Ischaemic	Mixed	
Male	40	28	63	4	0	135
Female	30	8	19	2	5	64
Total	70	36	82	6	5	199

Graph 1 Prevalence of maculopathy in diabetic retinopathy



*Kendall's tau test

Out of the 199 eyes, 129 patients had maculopathy. DR stage and prevalence of maculopathy had significant association (p value 0.002).

Table 3 DR stage Vs Type of maculopathy

DR stage	Maculopathy					Total	P value
	No	Focal	Diffuse	Ischaemic	Mixed		
No DR	5	0	0	0	0	5	<0.001
Mild NPDR	11	8	6	0	0	25	
Moderate NPDR	12	21	23	4	0	60	
Severe NPDR	8	3	24	1	3	39	
Very severe NPDR	2	0	2	0	0	4	
Early PDR	13	3	18	0	1	35	
High risk PDR	12	1	6	0	1	20	
ADED	7	0	3	1	0	11	
Total	70	36	82	6	5	199	

*Pearson's Chi-Square test

Moderate NPDR and severe NPDR had maximum proportion among the study population of which diffuse maculopathy was the commonest. The stage of progression of DR had significant association.

DISCUSSION:

Retinal diabetic changes are a result of continual chronic consecutive progressive and repetitive damages which increases the risk of visual impairment[14].

According to the WESDR study, the prevalence of maculopathy was 28% in type II diabetics whose diabetes duration was 20 years or longer and maculopathy was found in 3% of the patients already in the first 5 years of the disease[15]. Prevalence of macular edema increases with the severity of diabetic retinopathy[16]. In case of non-proliferative retinopathy, it is found in 6%, in pre-proliferative in 20–60%, whereas in proliferative retinopathy, it is found in even 70–74%[17].

In our study maximum number of diabetics belong to 6th decade i.e; 51-60 years age group which was comparable to Joslin et al[18] study. Male to female ratio was 2.1: 1 whereas Golubovic Arsovska[19] reported male to female ratio of 1.26:1.

58.76% of diabetic retinopathy cases had diabetes for less than 10 years which was slightly higher than Mahfouth et al study[20] (52%). Among patients with maculopathy, 49.61% had diabetes for less than 10 years but Klein R[21] reported 20.1% which may be explained by the early diagnosis and increased incidence of Diabetes now-a-days. The prevalence of diabetic maculopathy in retinopathy patients is 66.49% in our study is significantly the greatest as compared to literature reports, which can be explained by high selection of patients with diabetic retinopathy.

Diffuse maculopathy (63.57%) was the most common type of maculopathy followed by focal (27.91%), ischaemic (4.65%) and mixed (3.87%) maculopathy while in Golubovic et al study mixed maculopathy (77.56%) was the most common type of maculopathy followed by exudative (39%), ischaemic (4%) and edematous (1%) maculopathy.

Diffuse maculopathy was the commonest irrespective of DR stage. Mixed type of maculopathy was common in the fourth decade. DR stage and prevalence of maculopathy had statistically significant correlation (P value 0.002). Moderate NPDR and severe NPDR showed maximum proportion of patients with maculopathy. DR stage and type of maculopathy had statistically significant association (P value < 0.0001). Moderate NPDR and severe NPDR showed maximum proportion of patients with macular edema. DR stage and development of macular edema had no significant correlation (P value 0.513).

CONCLUSION:

The study demonstrated significant increase in diabetic maculopathy in the sixth decade. Diffuse maculopathy was the commonest irrespective of the stage of diabetic retinopathy.

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