A Prospective Study to Correlate Diabetic Maculopathy with Different Stages of Diabetic Retinopathy

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ABSTRACT

Object: To correlate of diabetic maculopathy whit h the stage of diabetic retinopathy.

Materials & Methods: This study conducted in Department of Ophthalmology, Teerthankar Mahaveer Medical College, Moradabad, India. All patients with diabetic retinopathy Stage of diabetic retinopathy according to Early Treatment Diabetic Retinopathy (ETDRS) grading system was done. Correlation of diabetic retinopathy with the stage of diabetic maculopathy was tested statistically.

Results: A total of 200 patients with diabetic retinopathy in the study out of which 136 (68%) were males and 64 (32%) were females. Out of 200 eyes studied, 160 (40%) had no maculopathy. Among the 240 (60%) eyes with maculopathy, maximum proportion of maculopathy was in 51-60 years. Diffuse maculopathy was the most common maculopathy found in this study. All 13 eyes with mixed maculopathy were in 41-50 age group.

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

Keywords: Diabetic Retinopathy, Maculopathy, Focal, Diffuse, Ischaemic.

INTRODUCTION

Diabetic retinopathy is a leading cause of blindness and visual impairment in both developed and developing countries and is included by WHO in their "VISION 2020" goal.[1] Diabetic maculopathy is the most important cause for visual impairment in patients with diabetic retinopathy. Diabetic macular oedema (DME) develops in 10% of all diabetic population and centre involving macular edema occurs in 4% of the diabetic population. Up to 30% of these patients develop moderate visual loss.[2]

Reduction in visual acuity in association with diabetic retinopathy most commonly occurs from diabetic macular edema.[3] Traditional methods of assessing DME include contact and noncontact slit-lamp biomicroscopy, indirect funduscopy, fluorescein angiography and fundus streo-photography. However, given the relative lack of ability of these methods to detect and to quantify DME, alternative objective methods have been applied. The introduction of OCT allows an objective evaluation of DME with effectiveness in both qualitative and quantitative description of this pathology. That is why it becomes a standard tool in the management of patients with DME.[4]

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.[5] Higher proportion of newly diagnosed type II diabetes have evidence of DR.[6-14]

Prevalence of DR strongly correlates with duration of diabetes. In addition to proliferative diabetic retinopathy, the most common cause of visual impairment is diabetic maculopathy and onset of macular edema.[15]

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.[16,17]

MATERIALS AND METHODS

Study Period

This study was conducted in Department of Ophthalmology, Teerthankar Mahaveer Medical College, Moradabad, India.

Inclusion Criteria

All patients with diabetic retinopathy Stage of diabetic retinopathy according to Early Treatment Diabetic Retinopathy (ETDRS) grading system was done. Correlation of diabetic retinopathy with the stage of diabetic maculopathy was tested statistically.

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Exclusion Criteria

i) Narrow angles

ii) Media opacities which preclude fundus examination

iii) Patients already treated for diabetic retinopathy.

Statistical Analysis

Data were entered and checked primarily with Microsoft Excel 2016. For continuous variables, the Chi square test was done in this study.

RESULTS

A total of 200 patients with diabetic retinopathy in the study out of which 136 (68%) were males and 64 (32%) were females. Out of 200 eyes studied, 160 (40%) had no maculopathy. Among the 240 (60%) eyes with maculopathy, maximum proportion of maculopathy was in 51-60 years. Diffuse maculopathy was the most common maculopathy found in this study. All 13 eyes with mixed maculopathy were in 41-50 age group.

Table 1: Maculopathy in number of patients according to sex distribution

Sex	No. of patients	Percentage
Male	136	68%
Female	64	32%
Total	200	100%

Table 2: Maculopathy in eyes of patients according to sex distribution

Eyes according to sex	Maculopathy	No Maculopathy
Male Eyes	184 (76.7%)	88 (55%)
Female Eyes	56 (23.4%)	72 (45%)
Total	240 (60%)	160 (40%)

### Table 3: Maculopathy in eyes of patients according to age distribution

Age	Focal	Diffuse	Ischaemic	Mixed	Total
41-50	4	15	10	13	42 (17.5%)
51-60	27	92	41	0	160 (66.6%)
61-70	21	6	0	0	27 (11.5%)
71-80	6	5	0	0	11 (4.5)
Total	58 (24.1%)	118 (49.1%)	51 (21.2%)	13 (5.4)	240

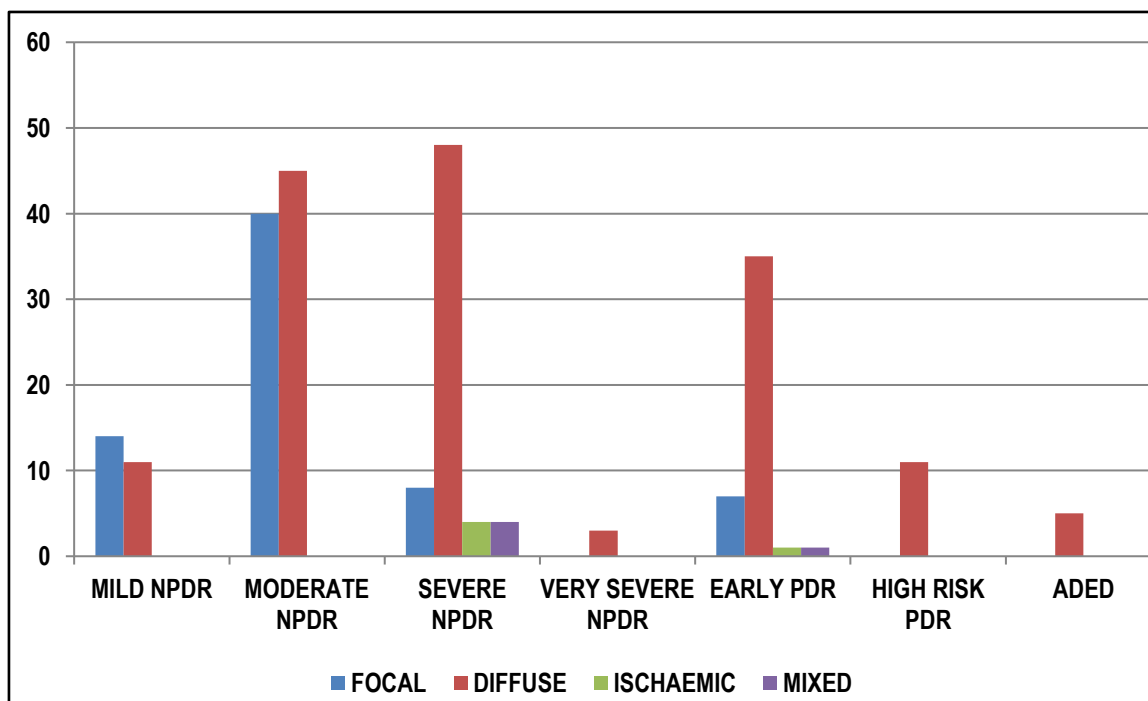### Table 4: Stages of Maculopathy according to sex distribution

Sex	Focal	Diffuse	Ischaemic	Mixed	Total
Male	54	122	8	0	184 (76.6%)
Female	11	32	4	9	56 (23.4%)
Total	65 (27%)	154 (64.1%)	12 (5%)	9 (3.7%)	240
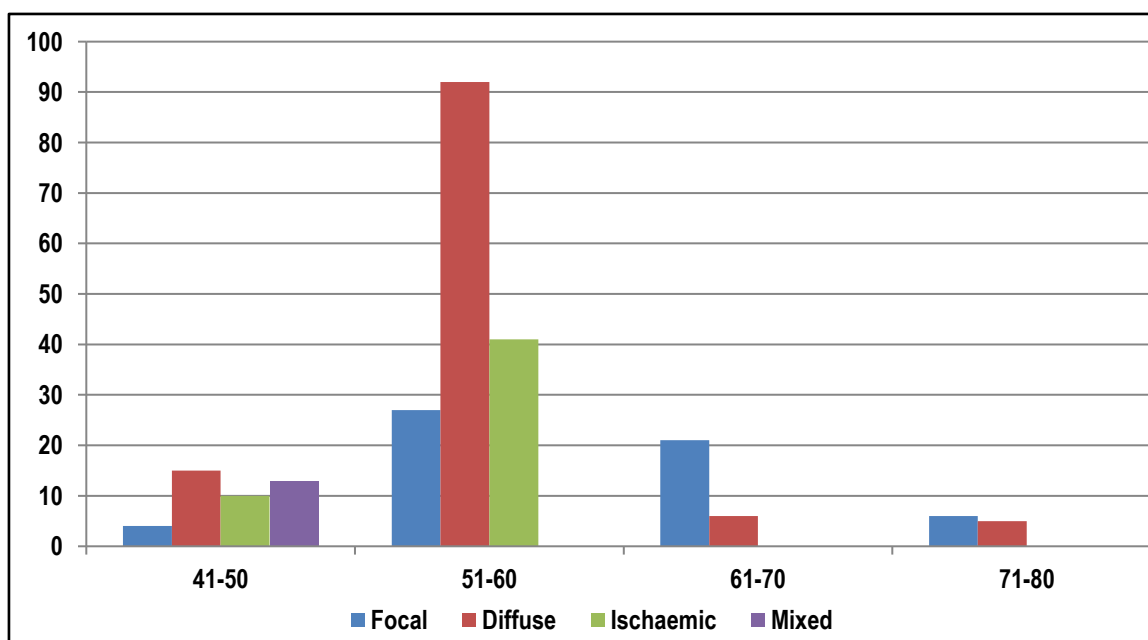
Graph 1: Maculopathy in eyes of patients according to age distribution
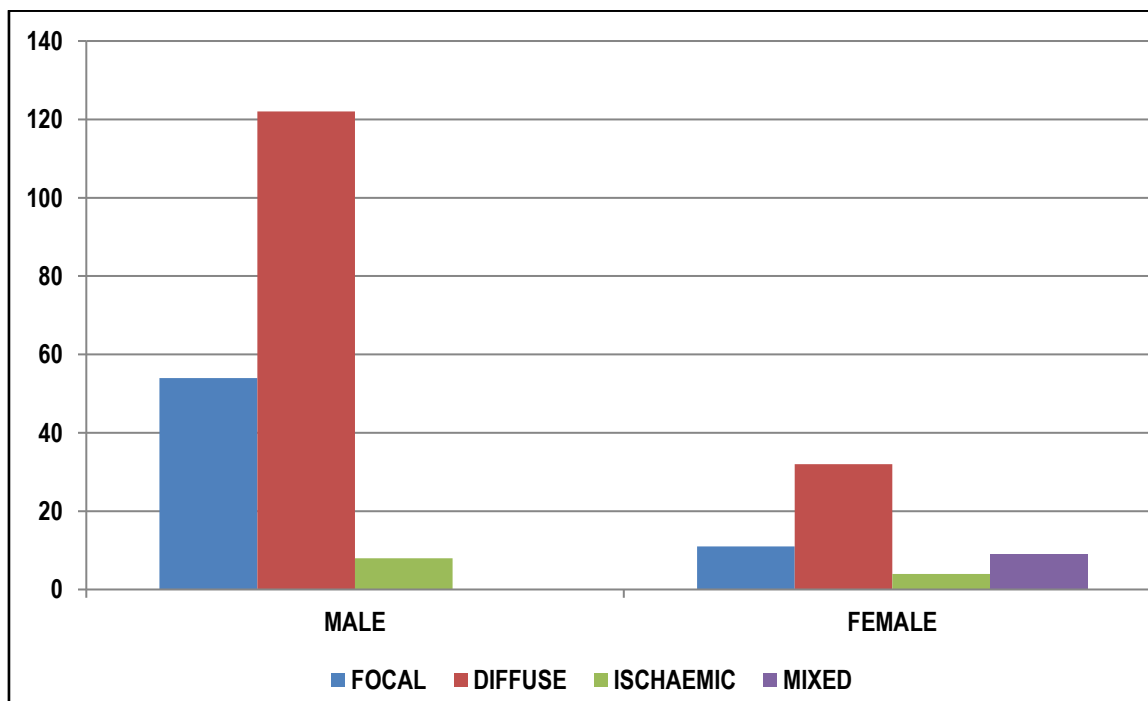
Graph 2: Stages of Maculopathy according to sex distribution

Graph 3: Correlation between types of maculopathy and stages of maculopathy

Table 5:- Correlation between types of maculopathy and stages of maculopathy

DR stage	Focal	Diffuse	Ischaemic	Mixed	Total
Mild NPDR	14	11	0	0	25 (10.4%)
Moderate NPDR	40	45	6	0	91 (37.9%)
Severe NPDR	8	48	1	4	61 (25.4%)
Very Severe NPDR	0	3	0	0	3 (1.2%)
Early PDR	7	35	0	1	43 (17.9%)
High Risk PDR	0	11	0	0	11 (4.5%)
ADED	0	5	1	0	6 (2.5%)
Total	69 (28.7%)	158 (65.8%)	8 (3.4%)	5 (2%)	240

DISCUSSION

In our study**,** patients had 60% maculopathy and 40 % with no maculopathy.This study compare to another study in which 35.1% had no maculopathy and 64.8% with maculopathy.

In this study, maximum number of percentage of diffuse maculopathy (49.1%) followed by focal (24.1%), Ischaemic (21.2%), mixed (5.4%). This study compare with another study in which percentage of diffuse maculopathy (41.2%) followed by focal (18%), Ischaemic (3%), mixed (2.5%) according to age distribution.

In another studies, (47.7%) male had maculopathy then female (17%) while in our study (76.6%) male had maculopathy then female (23.4%) according to sex distribution.

In this study, reported that 10.4% mild NPDR, 37.9% Moderate NPDR, 25.4% severe NPDR, 1.2% very severe NPDR, 17.9% early PDR, 4.5% high risk PDR, 2.5% ADED while other study reported 12.5% mild NPDR, 30.1% Moderate NPDR, 19.5% severe NPDR, 2% very severe NPDR, 17.5% early PDR, 10% high risk PDR, 0% ADED.[18]

Retinal diabetic changes are a result of continual chronic consecutive progressive and repetitive damages which increases the risk of visual impairment.[19]

In our study maximum number of diabetics belong to 6 decade 51-60 years age group which was comparable to Joslin et al study.[20] Male to female ratio was 2.1: 1 whereas Golubovic Arsovska reported male to female ratio of 1.26:1.[21]

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[22] the first 5 years of the disease. Prevalence of macular edema[23] increases with the severity of diabetic retinopathy. 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%.[24]

54% of diabetic retinopathy cases had diabetes for less than 10 years[25] which was slightly higher than Mahfouth et al study (52%). Among patients with maculopathy, 49.61% had diabetes for less[26] than 10 years but Klein R 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 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 proved momentous increase in diabetic maculopathy in the sixth decade. Diffuse maculopathy was the commonest irrespective of the stage of diabetic retinopathy.

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