



Morphological and visual acuity outcomes associated with single intravitreal injection of Anti- VEGF versus macular photocoagulation for diabetic macular edema

Authors

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Abstract

Aims & Objective: To compare the morphological and visual acuity outcomes associated with single intravitreal injection of Anti- VEGF versus macular photocoagulation for diabetic macular edema.

Method: A prospective case series descriptive study of 40 patients of diabetic macular edema who underwent macular photocoagulation or anti -VEGF injection. Age, sex, treatment method, follow up, pre & post treatment were evaluated.

Results: Overall 40 patients (20 in MCP group & 20 in Anti VEGF group) of which 24 were males & 16 were females. 42.5% patients were in the age group 51-60 years. Follow up duration was 4 months. Mean pre- treatment visual acuity in logMAR & CMT in MCP group was 0.309 ± 0.287 & $365.5 \pm 290.79 \mu\text{m}$. and in Anti-VEGF group was 0.423 ± 0.352 & $331.2 \pm 145.98 \mu\text{m}$. Mean post-treatment visual acuity in logMAR & CMT in group A was 0.353 ± 0.312 & $358.7 \pm 223.62 \mu\text{m}$. and in group B was 0.509 ± 0.394 & $310.3 \pm 57.5 \mu\text{m}$. The difference between pre-treatment & post -treatment visual acuity in group A was not significant ($p = 0.151$ at 4 month) but in group B it was significant ($p < 0.05$). The difference between pre-treatment & post- treatment CMT in both the groups were significant ($p = < 0.05$).

Conclusion: Both visual acuity & CMT significantly reduced in Anti VEGF group whereas in MCP group only there was reduction in CMT. But there was more reduction in macular thickness in Anti- VEGF group as compared to MCP groups.

Introduction

Diabetes is a chronic disease that typically causes changes in the small vessels of the whole body, which are referred to as Diabetic Microangiopathy, the ocular form is called Diabetic Retinopathy (DR). The reported prevalence of DR in India ranges from 17.6% to 28.2%

There are 2 main complications of DR that causes visual loss:

- (1) Proliferative diabetic retinopathy (PDR)
- (2) Diabetic Maculopathy (DME)

DME is defined as the retinal thickening caused by Intraretinal leakage of fluid, primarily in between inner nuclear layer & outer plexiform layer as well as swelling of the Muller cells of the retina. It can be present with any level of DR. More common in TYPE 2 DM (12.9%) than TYPE 1 DM (7.86%) as per the study group 2007. Occurs in 10% of all patients of DR. 3% in Mild NPDR, 38% in Moderate/Severe NPDR, 71% in PDR. There are different treatments for patients with macular edema, including the photocoagulation treatment with focal or grid

laser, which remains the gold standard of treatment for DME. In recent years new treatment regimens with intra-vitreous corticosteroid or anti-VEGF injections & combined treatments of laser and intra-vitreous injections. Despite the fact that ETDRS study has been the gold standard in the classification and treatment of DR & DME, it seems that DME photocoagulation laser treatment has been replaced by the new intravitreal drugs.

Methods & Materials

A prospective, randomized open label study was conducted on 50 patients of diabetic macular edema between 2017-2018.

Inclusion Criteria: Macular edema involving fovea with a thickness of >250µ confirmed by OCT.

Exclusion Criteria

- 1) Macular edema related to recent intraocular surgery or other procedure, vitreous traction(based on OCT).
- 2) H/O treatment for DR or Laser photocoagulation in last 6 months.
- 3) Patients <18yrs.
- 4) OCT evidence of vitreo-retinal interface abnormality.
- 5) Any ocular abnormality like uveitis, glaucoma, vitreo-retinal diseases.

All patients were grouped into two groups(20 patients in each) to receive either macular photocoagulation or intra-vitreous injection of Anti-VEGF [Inj. Bevacizumab 1.25mg/0.05ml]

Pre-treatment evaluation: after obtaining detailed history,meticulous clinical examination both

systemic & ocular were carried out after informed consent of all the patients included in the study.

Ophthalmological examination included

- 1. Visual acuity- BCVA recorded of both eyes using Snellen’s chart for literate and ‘E’ chart for illiterate patients.
- 2. Slit lamp examination
- 3. IOP measured with NCT of both eyes.
- 4. Detailed fundus examination by indirect ophthalmoscopy and slit lamp biomicroscopy after dilating pupil using mydriatic drops (Tropicamide + phenylephrine).
- 5. OCT (HEIDELBERG SPECTRALIS OCT) done preoperatively both eyes to note macular thickness and macular oedema.
- 6. FUNDUS FLUORESCIN ANGIOGRAPHY (FFA) to know about perfusion status of the retina, the location and type of macular edema and the presence of CSME in choosing our treatment plan.

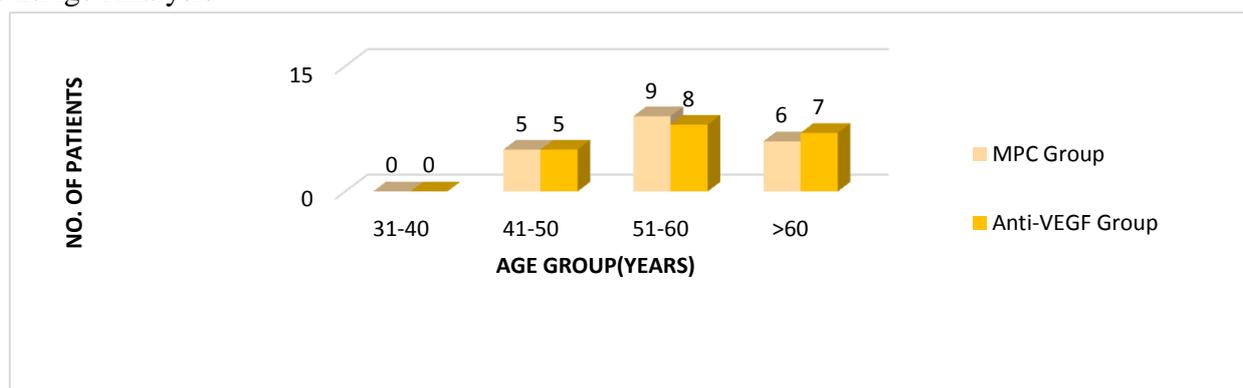
Method

50 patients randomly were grouped into 2 groups (25 eyes for IVB group &25 eyes for MLT) to receive either single intravitreal injection 1.25mg/0.05ml of bevacizumab or focal /grid laser for maculopathy.

Results

The age and sex wise distribution, duration of diabetes, pre-treatment visual acuity,CMT & post treatment visual acuity and CMT were analyzed.

Table 1:Age Analysis



In this study highest no. of patients were in the age group of 50-60 years that is 9(45%) in group A and 8(45%) in group B. 6(30%) in group A & 7(35%) in group B were >60 yrs and remaining were <50 yrs of age in both group.

In this study, in group A 11(55%) were female & 9(45%) were males.

In group B 15(75%) were male and 5(25%) were female.

Table 2: Duration of diabetes

Duration (yrs)	No. of patients		Total	P value LS
	MPC group(N=20)	Anti- VEGF group (N=20)		
<5	0(0%)	0(0%)	0(0%)	NA
5-10	3(15%)	3(15%)	6(15%)	0.658NS
11-15	8(40%)	7(35%)	15(37.5%)	
>15	9(45%)	10(50%)	19(47.5%)	
P value LS	Chi-square = 0.119 with 2 degrees of freedom; P = 0.942			

20	20
3	3
17	17

Chi-square = 0.196 with 1 degree of freedom; P = 0.658

19	19
9	10
10	9

Chi-square = 0.000 with 1 degree of freedom; P = 1.000

In our study most of the patients (47.5%) of DME have duration of diabetes of > 15 years.

Fig.1.

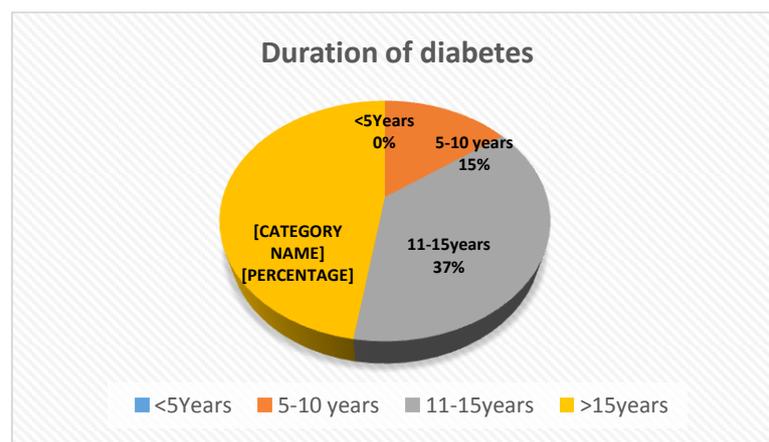


Table 3 Comparison of visual acuity between MPC & Anti-VEGF group BCVA(mean +SD) before treatment

	MPC GROUP (n=20)	Anti-VEGF Group (n=20)	P Value LS
Baseline	0.309±0.287	0.423±0.352	
1.5 month	0.330±0.258	0.517±0.456	
4 month	0.353±0.312	0.509±0.394	
P Value LS			

Fig. 2 BCVA pre & post treatment of group A & group B (unpaired T test)

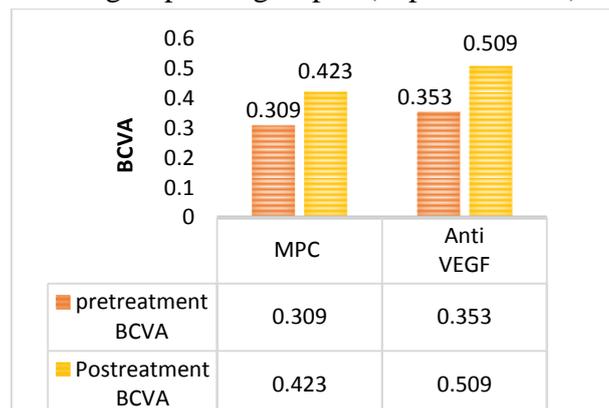
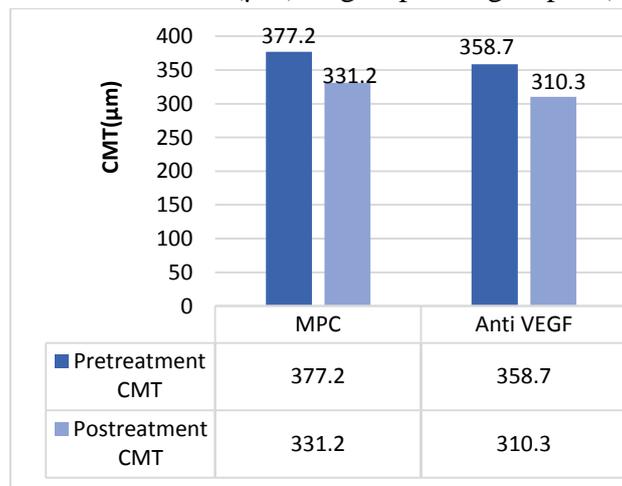


Fig. 3. Comparison pre & post treatment CMT (µm) of group A & group B (unpaired T test)



Conclusion

Out of 40 patients 60%(24) were male & 40%(16) were female. Majority of patient (42.5%) were of age group 51-60 years & 32.5% were >60 years of age. 25% were in age group 41-50 years signifying disease was more prevalent in age group >40 years, hence age is a significant factor. 47.5% had duration of diabetes >15years, 37.5% had duration of 11-15 years,15% had 5-10 years of duration. None of the patient had duration <5yrs suggesting that duration of diabetes is the major predisposing factor for DME.

Mean BCVA Pretreatment & post treatment at 1.5 &4 months in group B(Anti VEGF group) increased [p value <0.001] w.r.t baseline than in group A (MPC Group) [p value 0.151 at 4 months] Mean CMT pretreatment & post treatment at 1.5 month decreased significantly in both groups (p value 0.007).

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