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Original Research Article

Visual acuity after intravitreal injection of triamcinolone acetonide in patients with diabetic macular edema

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Abstract

Objective: Present study was done to assess the effect of Intravitreal injection of Triamcinolone Acetonide on visual acuity in patients with diabetic macular edema.

Method: This prospective study was conducted on 30 eyes of 30 patients attending the OutPatient Department of Upgraded Department of Ophthalmology, Government Medical College & Hospital, Jammu, with macular edema due to diabetic retinopathy who received 4mg Intravitreal Triamcinolone Acetonide injection. Among these, 11 patients had baseline best corrected visual acuity of <6/60 and 19 patients had baseline best corrected visual acuity of 6/60. The change in visual acuity was followed for all cases at preopreation and at 1week,2week and at 3 months with Snellen chart.

Results: Improvement in visual acuity was seen at 3 months. Of 11 patients with baseline visual acuity of <6/60, 72.7% (n=8) patients showed improvement and of 19 patients with baseline best corrected visual acuity of 6/60, 68.4% (n=13) patients showed improvement of 1-2 snellen lines at 3 months of follow up. No change in visual acuity from preoperation was seen at 1 week and at 2 weeks.

Conclusion: Intravitreal injection of 4mg Triamcinolone Acetonide is beneficial as a treatment for diabetic macular edema. Our study found improvement in visual acuity of 1-2 snellen lines after intraviteal injection of Triamcinolone acetonide in patients with diabetic macular edema.

Keywords: Triamcinolone acetonide, diabetic macular edema, visual acuity.

1. Introduction

Diabetic Macular Edema is the leading cause of blindness in an increasing number of patients with diabetes. Reduction of visual acuity in diabetic macular edema results from accumulation of fluid produced from the disruption of blood retinal barrier into inner layers of retina. Laser photocoagulation in such cases reduces the risk of visual loss in 60% of patients. However recurrences were common and despite laser treatment, 26% of patients with diabetic macular edema experienced loss of vision [1].

The ETDRS Research Group [2] showed significant benefit in using focal laser photocoagulation for the treatment of Clinically Significant Macular Edema; however, some cases were refractory to laser therapy [3]. Intravitreal Triamcinolone was then used for such refractory cases as it attenuates the VEGF mediated retinal capillary permeability. It significantly reduced macular thickening [4] and improved visual acuity [5] Triamcinolone Acetonide has potent anti-inflammatory, antiangiogenic [6] and antipermeability actions, thereby inhibiting the production of vascular endothelial growth factors [7] and thus helps to maintain blood retinal barrier and facilitates the absorption of exudates. In addition, they inhibit prostaglandins and interleukin synthesis which results in local reduction of inflammatory mediators. The resultant anti-inflammatory effect contributes to the reduction of macular edema [8] which is due to breakdown of bloodretinal barrier with subsequent accumulation of fluid in intraretinal and subretinal spaces of macula. Increased diffusion by modulation of calcium channels [9] also account for the efficacy of corticosteroids.

2. Material and Methods

This prospective study was conducted on 30 eyes of 30 patients attending the Out Patient Department of Upgraded Department of Ophthalmology, Government Medical College & Hospital, Jammu for a period of one year. Patients with macular edema due to diabetic retinopathy were included in the study, who received 4mg Intravitreal Triamcinolone Acetonide injection.

An informed consent was taken from all the patients who were included into the study. Patients having history of previous Intravitreal injection of steroid, anti-vegf or laser

treatment, glaucoma, ocular hypertension were excluded from the study. All the patients were evaluated preoperatively including best corrected visual acuity,, slit lamp biomicroscopic examination with +90D lens, fundus fluorescein angiography and baseline intraocular pressure using non contact tonometer,

The injection was carried out under all aspectic precautions and under topical anesthesia using 0.5% proparacaine. The injection was given in inferotemporal quadrant 3mm from limbus (in aphakics and pseudophakics) and 3.5mm from limbus in phakic patients to ensure the passage of needle through vitreous base. Using a single purposeful continuous maneuver, Triamcinolone acetonide 4 mg (0.1) ml was injected transconjuctivally with 30 –gauge needle attached to a tuberculin syringe into the eye aiming for mid vitreous cavity. The needle was removed simultaneously with the application of cotton tipped applicator over its entry site to prevent regurgitation of injected material. Patients were put on topical antibiotic eye drops for a week. The change in visual acuity was followed for all cases at 1 week, 2 week and at 3 months respectively using snellen chart.

2.2 Statistical Analysis

Data was expressed as percentage.

3. Results

Intravitreal injection of triamcinolone acetonide was given to all the enrolled patients and following observations were made:

Table 1: Preinjection Baseline Visual acuity

Baseline visual acuity	Diabetic macular edema N	%
<6/60	11	36.66
6/60	19	63.33
Total	30	100

Of the 30 patients, 11 patients had baseline best corrected visual acuity of <6/60 and 19 patients had baseline visual acuity of 6/60. The change in visual acuity was followed for all cases at preopreation and at 1week, 2 week and at 3 months with Snellen chart. No change in visual acuity from preoperation was seen at 1 week and at 2 weeks.

Table 2: Visual acuity at three months

Visual acuity	Diabetic macular edema N	%
<6/60	03	10
6/60	13	43.33
6/36	06	20
6/24	07	23.33
6/18	01	3.33
Total	30	100

Table 2.1 Baseline visual acuity and visual acuity at 3 months in patients with diabetic macular edema

Baseline visual acuity	Patients with improved visual acuity at 3 months N	%	Patients with same visual acuity at 3 months N	%	Total
<6/60*	8	72.7%	3	27.2%	11
6/60**	13	68.4%	6	31.5%	19

Table 2.2 Distribution of patients with different levels of visual acuity at 3 months in diabetic macular edema

Baseline visual acuity	At 3 months <6/60 n	At 3 months 6/60 n	At 3 months 6/36 N	At 3 months 6/24 n	At 3 months 6/18 n	Total N
<6/60*	03	07	0	1	0	11
6/60**	0	06	06	06	01	19

Of 11 patients with baseline best corrected visual visual acuity of <6/60, 7 patients showed improvement to 6/60 and 1 patient improved to 6/24 at 3 months as shown in table 2.2. So 72.7 % (n=8) patients showed improvement from baseline best corrected visual acuity of <6/60 at 3 months as shown in table 2.1. and of 19 patients with baseline best corrected visual acuity of 6/60,6 improved to 6/36,6 improved to 6/24 and 1 improved to 6/18 as shown in table 2.2 So 68.4%(n=13)patients showed improvement from baseline best corrected visual acuity of 6/60 as shown in table (2.1).

4. Discussion

Diabetic retinopathy is the most common cause of newly diagnosed legal blindness amongst the working population in the industrialized world today. The common causes of visual impairment in diabetic retinopathy include macular edema and complications due to proliferative retinopathy. The majority of diabetics have type II disease, wherein macular edema is commoner, it follows that overall, macular edema accounts for more vision impairment than proliferative retinopathy. Capillary leakage due to damaged blood retinal barrier can cause macular edema. Corticosteroids have long been known to tighten up blood vessels resulting in decrease of vessel leakage.

Triamcinolone Acetonide reduces the breakdown of blood retinal barrier after Intravitreal Injection and treat macular edema by means of anti inflammatory and blood retinal barrier stabilizing effects. The results of the present study suggest that the intravitreal injection of triamcinolone is beneficial as a treatment for diffuse diabetic macular edema. Chieh *et al* [10] found that Intravitreal Injection of 1-4 mg of

Triamcinolone Acetonide benefitted the patients by improving Visual acuity in eyes with clinically significant macular edema which was similar to our study.

In present study, we had 30 patients of Diabetic Macular Edema and we found that out of 11 patients with baseline Visual acuity of <6/60, 72.7% (n=8) patients showed improvement and out of 19 patients with baseline Visual acuity of 6/60, 68.4%(n=13) showed improvement in Visual acuity of 1-2 snellen lines at 3 months of follow up. Lee WF, Yang CM [11] found that among patients with diagnosis of macular edema secondary to increased retinal vascular permeability that received single injection of Intravitreal Triamcinolone Acetonide, 10(63%) out of 16 eyes showed visual gain of 2 or more Snellen lines at 6 month of follow up which was similarly seen by present study. Tuncer *et al* [12**]** studied that all those patients who were given Intravitreal Triamcinolone Acetonide injection had resolution of intraocular inflammation and improvement of Visual acuity.

5. Conclusion

Intravitreal injection of 4mg Triamcinolone Acetonide is beneficial as a treatment for diabetic macular edema. Our study found improvement in visual acuity of 1-2 snellen lines after intraviteal injection of Triamcinolone acetonide in patients with diabetic macular edema.

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