To Study the Efficacy of Intravitreal Injection Ranibizumab on Cystoid Macular Edema in the Retinal Vein Occlusion

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Abstract :

Aim and objective : To study the efficacy of intravitreal injection ranibizumab on cystoid macular edema in the retinal vein occlusion (RVO).

Method and material : in our study 22 eyes of 22 patients with cystoid macular oedema due to retinal vein occlusion were given intravitreal injection ranibizumab 0.50 mg in 0.05ml and followed up in the post op period to see the effect. An observational study has been conducted for it.

Results : The mean age group was 56.36±8.11.Total 22 patients with 17 males (77.27%) and 5 females (22.73%) were taken with no drop out.The mean average change in BCVA improved substantially from 6/60 to 6/18 and with mean central retinal thickness decrease from 546µm to 315µm . 22 patients with retinal vein occlusion were included in our study. 6 patients had CRVO while rest 16 patients had BRVO.

Conclusion : Intravitreal Ranibizumab is safe and is effective in improving BCVA in cystoid macular edema due to retinal vein occlusion.

Key words : Ranibizumab, Cystoid macular edema, Central retinal thickness

Introduction:

Retinal vein occlusion is the second most common retinal vascular disorder after diabetic retinopathy.[1] Amongst retinal vein occlusion branch retinal vein occlusion(BRVO) is most common cause. Macular edema occurring in about 60% of cases is the most frequent cause of visual loss in patients with BRVO.[2] BRVO can lead to fluid leakage which occurs in response to increased intravascular pressure behind the occlusion. In BRVO retinal is chemia induces the secretion of inflammatory mediators like vascular endothelial growth factor (VEGF) which is the major cause of breakdown of the blood-retinal barrier, endothelial dysfunction and increased vascular permeability.[3] Based on the localization, branch RVO (BRVO) is defined as occlusion of a branch of the retinal vein system and central RVO (CRVO) is defined as occlusion located in the central retinal vein.[4,5] RVO is a significant cause of vision loss with overall incidence of 0.21% among patients above 40 years of age.[6] It is estimated that approximately 16 million people develop RVO worldwide out of which BRVO comprises 80% of cases. [8]

RVO causes severe loss of vision due to macular edema, retinal neovascularization and retinal detachment.[9] Arterial stiffness is main pathogenesis for the development of BRVO. It can cause venous compression in the common adventitial sheath. [4,7] The main risk factors of BRVO are aging, cardiovascular diseases, smoking and hypertension.[10]

Several treatment modalities for treatment of macular edema secondary to BRVO which are currently available are laser photocoagulation, intravitreal dexamethasone implants and anti-VEGF agents such as ranibizumab, bevacizumab, and aflibercept.[11] Recently anti-VEGF agents are being used more frequently in macular edema in BRVO treatment. VEGF and the aqueous concentration of inflammatory factors are found significantly increased in eyes with macular edema secondary to BRVO.[12] Anti-VEGF agents can achieve anatomical resolution of macular edema, stabilization and improvement of the best-corrected visual acuity (BCVA) in BRVO patients.[13,14] Ranibizumab is the first VEGF inhibitor to be approved by USFDA for use in BRVO.[15] A Study of the Efficacy and Safety of Ranibizumab Injection in Patients With Macular Edema Secondary to Central Retinal Vein Occlusion (CRUISE) trials have demonstrated the benefits of ranibizumab on visual acuity and central macular thickness (CMT) both branched retinal vein occlusion and central retinal vein occlusion.[15,16]

Aim and objective :

To study the efficacy of intravitreal injection ranibizumab on cystoid macular edema in the retinal vein occlusion (RVO).

Method and material :

We conducted an observational study in which we observed 22 eyes of 22 patients with cystoid macular edema due to retinal

vein occlusion were given intravitreal injection ranibizumab 0.50 mg in 0.05ml and followed up in the post op period to see the effect. This is study was done in B.R.D medical college, Gorakhpur.

Inclusion Criteria :

- Age >20
- Macular oedema secondary to BRVO and CRVO
- BCVA between 6/60 -6/18

Exclusion Criteria :

- Participant not willing to give informed consent
- Any ocular infection in either eye present at time of study.
- Previous episode of RVO.
- History of corticosteroid in traocular or periocular within 3 Month.
- Any ocular disease that compromise visual acuity or require medical or surgical intervention in the study eye during study period.
- Glaucoma with in traocular pressure (IOP) ≥30 mmHg on medication at the screening or within 6 months before the baseline visit.
- Neo vascularization of the iris or neo vascular glaucoma in either eye at time of study.
- Past episode of RVO in the study eye.
- Previous treatment with any anti-angiogenic drug in either eye within 3 months before the baseline visit.
- Any systemic anti-VEGF drug taken within 6 months before the baseline visit.
- History of stroke.
- Uncontrolled blood pressure ⩾170/110mmHg

Examination :

- Informed consent was taken from all patients taken for the study and following preoperative evaluation
- Visual acuity assessment
- Intra-ocular pressure
- Slit lamp examination for anterior Segment
- Fundus examination-Direct and Indirect ophthalmoscopic
- Optical coherence tomography

Technique of injecting intravitreal Ranibizumab :

The test eye was topically anesthetized and povidone iodine (10%) disinfection was done on lids and lashes. Using sterile speculum eyelids were retracted and three times Povidone iodine (5%) drops were instilled on the ocular surface. Additional topical anesthesia was achieved via 4% lidocaine. Then Ranibizumab (0.05 ml in 0.50mg) in an insulin syringe with a 30-gauge needle was injected through the pars plana into the vitreous cavity through the sclera 3 to 4 mm posterior to the limbus at infero-temporal quadrant. After injecting Ranibizumab light perception was assessed and in traocular pressure(IOP) was taken. Then patient was asked to put topical antibiotics to the injected eye 4 times a day for 3 days. Post injection follow-up was done on day 1 , day 7, day 15 and on day 30.

OBESERVATIONS :

Table 1: Number of patients distributed into the type of RVO:

Disease	Male	Female	Total	%
CRVO	4	2	6	27.27
BRVO	1	6	16	72.73

Table 2 : Change in BCVA in BRVO patients with respect to number of patients following 1 month of 1st, 2nd Intravitreal ranibizumab injection

BCVA	1st IVR	2nd IVR
1 line(6/60)	1	2
2 line(6/36)	2	1
3 line(6/24)	10	11
4 line(6/18)	3	2
5 line(6/12)	-	-
Total no. of patients	16	16

Table 3 : Change in central macular thickness(µm) 1 month after 1st and 2nd intravitreal ranibizumab injection.

INTRAVITREAL RANIBIZUMAB INJECTION	CMT PRIOR TO IVR (µm)	CMT POST -IVR (µm)	DIFFERENCE IN CMT POST - IVR (µm)
PRE-INJECTION	546.32 ± 41.50	-	-
1ST IVR	546.32 ± 41.50	373.45 ± 87.01	173.77 ± 72.90
2ND IVR	373.45 ± 87.01	315.45 ± 74.36	58.09 ± 40.96

Results :

22 patients with retinal vein occlusion were included in our study. 6 patients had CRVO while rest 16 patients had BRVO.

The mean age group being 56.36 ± 8.11.

Observations in relation to cmt :

It was observed that the mean central macular thickness in pre-injection patients was 546.32 ± 41.50 µm.

After 1 month of post-injection of 1st intravitreal Ranibizumab the mean central macular thickness was found to be 373 ± 87.01 µm, a mean difference of 173.77 ± 72.90 µm.

2nd intravitreal ranibizumab injection had CMT of 373 ± 87.01 µm resulted in mean reduction of CMT 315 ± 74.36 µm, with a mean difference of 58.09 ± 40.96 µm.

Discussion :

This study was done to confirm the effect of Ranibizumab 0.50 mg in patients with macular edema secondary to BRVO and CRVO.

Ranibizumab treatment was associated with rapid gain of BCVA within the first month after treatment was started.

It was associated with a rapid decrease of central macular thickness of 173µm in first intravitreal injection of Ranibizumab..

IOP was stable post injection.

No injection related complications were seen.

None of patients developed systemic or ocular side effects.

Conclusion :

In observational study, an intravitreal Ranibizumab injection 0.50 mg in 0.05 ml for cystoid macular edema due to retinal vein occlusion was found safe and well tolerated with improvement in visual acuity and reduction in central macular thickness on OCT.

Gain in visual acuity and decrease in central macular thickness was statistically significant after intravitreal Ranibizumab 0.50mg in 0.05ml.

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