DOI: https://doi.org/10.53350/pjmhs20221611502

ORIGINAL ARTICLE

Comparison Between Intra Vitreal Bevacizumab and Triamcinolone in Reducing Macular Thickness in Central Retinal Vein Occlusion

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ABSTRACT

Objectives: To compare the effect of intra vitreal bevacizumab (IVB) and intra vitreal triamcinolone (IVT) in reducing macular thickness in central retinal vein occlusion.

Methods and Materials: This quasi experimental study was conducted at Department of Ophthalmology, Hayat Abad Medical Complex Peshawar in the period from 01 January 2020 to 30 June 2020. Total 40 patients presented with central retinal vein occlusion (CRVO). Patients were divided into two groups, group A received IVB treatment and group B received IVT treatment. The patients were followed up on 6th month post treatment. The primary outcomes of the study were visual acuity and reduction in macular thickness on OCT post treatment.

Results: 40 patients were enrolled in the study. The mean age of patients was 60.70±15.49 in group A and in group B 60.40±12.83. There were 13 males and 7 females in group A and 12 males and 8 females in group B. Mean VA at baseline was 1.0825±0.25 logMAR in group A and
0.9745±0.29 logMAR in group B. Mean macular thickness at baseline was 625.40±47.15 µm in group A and 642.05±44.23 µm in group B. Mean VA at 6th month post treatment follow up was 0.4195±0.23 logMAR in group A and in group B was 0.4960±0.27 logMAR. At 6th month follow up macular thickness was 261.80±26.269 µm in group A and 263.80±22.209 µm in group B.

Conclusion: Intravitreal injections of bevacizumab and triamcinolone have shown a reduction in macular edema in CRVO patients along with improvement in visual acuity.

Keywords: Bevacizumab, Triamcinolone, Macular Edema, Central Retinal Vein Occlusion, Visual Acuity

INTRODUCTION

Retinal vein occlusion (RVO) is a predominant ischemic optic neuropathy (ION), secondary to diabetic retinopathy and categorizing RVO as one of the most common retinal vascular complications. RVO is considered to be as fatal as it may cause blindness and is supposed to be the fifth prevalent factor behind loss of sight[1-2].RVO is classified as central retinal vein occlusion (CRVO) and branch retinal vein occlusion (BRVO), affected vein lesion is the key factor behind those two conditions.CRVO is a vascular retinal problem of a common type in which the region close to the lamina cribrosa of the cranial nerve II is afflicted and poses danger to the central retinal vein .e.g symptoms might include blurred vision and complete vision loss etc. In BRVO obstruction, occurs in the central retinal vein's one or two divisions that route through the cranial nerve/optic nerve which leads to symptoms like blurred vision and loss of peripheral vision[3-4].

Visual acuity baseline in CRVO and BRVO eyes ranges 20/40 to <20/200 is considered poor, if CRVO eyes not treated in time visual acuity gradually reduces in time, but BRVO eyes improve even without any treatment[5].

In CRVO eyes tenacious loss of sight is due to macular edema (ME), macular ischemia, and in some cases neovascular glaucoma.CRVO eyes revealed proofs of expression of mRNA and intraretinal vascular endothelial growth factor VEGF. ME is a medical condition in which substantial leakage occurred from an injured retinal blood vessel and sometimes the development of anomalous blood vessels in the deep retina, which causes macular thickness. Patients affected with RVO experienced reduced vision associated with the underlying condition of ME[6-8]. It is the major cause of blindness with intermediate uveitis cases of 85% and panuveitis cases of 59%[9]. Diagnosis of CRVO is possible by thorough clinical examination and its progression is usually monitored by visual acuity and central foveal thickness (CFT) with the help of optical coherence tomography (OCT)[10].

Treatment like intravitreal (IVT) bevacizumab and suprachoroidal IVT triamcinolone acetonide both are considered to be effective treatments for macular edema reduction in CRVO along with improved visual acuity, similarly, both drugs have their advantages and disadvantages. Intravitreal bevacizumab consists of an antibody (humanized monoclonal), which successfully helps in the binding of VEGF and prevents its contact with receptors present in endothelial cells, results in the lessening of VEGF activity with an outcome of vascular permeability and angiogenesis[11]. Some studies suggested CRVO and macular degeneration concerning age in response to intravitreal bevacizumab but other studies reported ME reduction and improvement in visual acuity in CRVO patients administered by bevacizumab injection[8].

Suprachoroidal injection offers a different path of provision that has benefits for corticosteroids management and provides a path to choroid and retina by minimizing the risks for glaucoma and cataracts, suprachoroidal injection of triamcinolone acetonide is a comparatively new method for dealing with diverse retinal vascular pathologies, the drug transfer method of this technique has shown promising outcomes with the success of posterior segment drug concentrations simultaneously drug exposure reduction to the eye's anterior portions. A 4mg suprachorodial injection of triamcinolone reported efficacy in patients with 0% elevation observed in intraocular pressure IOP related to steroid[12]. A Tanzanite study revealed the efficacy of suprachoroidal triamcinolone acetonide along with intravitreal aflibercept in RVO patients in terms of anatomical and visual outcomes[13].

MATERIALS AND METHODS

This quasi experimental study was conducted at Department of Ophthalmology, Hayat Abad Medical Complex Peshawar in the period from 01 January 2020 to 30 June 2020. Total40 patients from the OPD were selected for the study and were divided into two groups having 20 patients each. A written consent was taken from the patients. Patients having age between 40 to 80 years, with central macular thickness >250 µm, visual acuity of 20/200 and clinically diagnosed with Central retinal vein occlusion by an expert vitreo-retina consultant were included in the study. Patients previously treated for CRVO, having history of glaucoma and diabetic retinopathy were excluded from the study. Group A patients received intravitreal bevacizumab (1.25mg) and Group B patients received suprachoroidal triamcinolone (4mg). The primary

outcome of this study were visual acuity and macular thickness on OCT at baseline and at six months after treatment.

Categorical variables were presented as percentages and frequencies, numerical variables were presented as mean and standard deviation. Nonparametric test was applied to assess association between both groups keeping P value < 0.05. All the analysis were performed using IBM SPSS version 20.

RESULTS

A total number of 40 patients were enrolled in this study. 20 patients were allocated in Group A which received IVB treatment and 20 patients were allocated in Group B which received IVT treatment. The mean age in group A was 60.70±15.49 and in group B 60.40±12.83. There were 13 males and 7 females in group A and 12 males and 8 females in group B. Visual acuity was 1.0825±0.25 logMAR in group A and 0.9745±0.29 logMAR in group B at baseline. There was no statistical significance between two groups in visual acuity (p = 0.245). Macular thickness at baseline was recorded 625.40±47.15 µm in group A and 642.05±44.23 µm in group B, no statistical significance was recorded in both groups (p = 0.239). at 6 months' post treatment follow up, visual acuity in group A was 0.4195±0.23 logMAR and in group B was 0.4960±0.27 logMAR, no statistical significance was recorded in both groups (p = 0.351). Macular thickness was recorded 261.80±26.269 µm in group A and 263.80±22.209 µm in group B, no statistical significance was found between both groups (p = 0.796)

Table 1: Baseline demographics

Treatment Group	Gender Distribution		Patient's Age (Mean±SD)	LogMAR at baseline (Mean±SD)	Macular thickness at baseline (Mean±SD)
	Male	Female			
Group A IVB (n=20)	13 65%	7 35%	60.70±15.49	1.0825±0.25	625.40±47.15
Group B IVT (n=20)	12 60%	8 40%	60.40±12.83	0.9745±0.29	642.05±44.23
P value	0.744		0.935	0.245	0.239

Table 2: Visual acuity and macular thickness at 6th month post treatment

Treatment Group	LogMAR at 6 months (Mean±SD)	Macular thickness at 6 months (Mean±SD)
Group A IVB (n=20)	0.4195±0.23997	261.80±26.269
Group B IVT (n=20)	0.4960±0.27144	263.80±22.209
P value	0.351	0.796

DISCUSSION

Triamcinolone has been appeared to suppress the outflow of the vascular endothelial development factor (VEGF), likewise to anti-inflammatory properties, anti-permeability function and neuroprotective impacts; Anti-VEGF agents, for example bevacizumab, apply immediate, strong suppression of VEGF[14]. Several studies have shown a decrease in macular edema because of CRVO with triamcinolone or bevacizumab have uncovered promising results[15,16].

In our study the mean age of the patients receiving IVB treatment was 60.70±15.49 and patients receiving IVT treatment was 60.40±12.83, which is comparable to a study conducted in Pakistan[17] in which the mean age in IVT+IVB group was 60.93±4.38 and IVB alone group was 60.73±3.67. In another study conducted in Korea[18] the mean age of Bevacizumab group was 67.5 ± 16.6 and Triamcinolone group was 72.6 ± 2.9. In our study the IVB group had 65% males and 35% females while IVT group had 60% males and 40% females, which is comparable to study conducted in Korea[19] which showed 45.5% males and 54.5% females in Bevacizumab injection group and 39.3% males and 60.7% females in Triamcinolone acetonide injection group.

At baseline the visual acuity of IVB group was 1.0825±0.25 logMAR and IVT group was 0.9745±0.29 logMAR, which is comparable to a Pakistani study[17] which showed visual acuity of IVT+IVB group 0.87±0.09 logMAR and IVB alone group 0.88±0.10 logMAR. At 6th month post treatment follow up there was a promising improvement in visual acuity in both groups in our study. The IVB group showed visual acuity 0.4195±0.23997 logMAR and IVT group showed 0.4960±0.27144 logMAR. Similar findings were recorded in the aforementioned study which showed significant improvement on 6th month post treatment follow up in visual acuity in IVT+IVB group and IVB alone having 0.32±0.06 logMAR and 0.44±0.06 logMAR respectively. In our study the macular thickness at baseline was 625.40±47.15 µm in IVB group and 642.05±44.23 µm in IVT group. Similar findings were recorded by a Korean study [18] which showed macular thickness 713.6±179.3 µm in Bevacizumab group and 716.7±199.1 µm in Triamcinolone group at baseline. Our study showed improvement in reduction of macular thickness on OCT at 6th month post treatment follow up, the IVB group showed reduction in macular thickness 261.80±26.269 µm and the IVT showed 263.80±22.209 µm. The Korean study[18] showed reduction in macular thickness at 6th month post treatment in both groups.

Several studies have advocated the use of Bevacizumab over Triamcinolone, one study reported an increase in intraocular pressure and development of cataracts as two major side effects of intravitreal triamcinolone[18]. Since our study was limited to 6 months of follow up, long term follow up of both treatments can further explore the side effects and benefits of both treatments.

CONCLUSION

We conclude from our study that intravitreal injections of bevacizumab and triamcinolone have shown a reduction in macular edema in CRVO patients along with improvement in visual acuity. However, the results have shown no significant difference in both treatment groups.

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