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Original Research Paper

Opthalmology

THE ROLE OF INTRAVITREAL ANTI VASCULAR ENDOTHELIAL GROWTH FACTOR IN CLINICAL OUTCOME OF NEOVASCULAR GLAUCOMA

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KEYWORDS :

INTRODUCTION

Neovascular glaucomais a type of secondary glaucoma. It is characterized by the growth of abnormal new blood vessels (neovascularization) on the iris and the angle of the eye.

In NVG, the abnormal vessel formation is often a response to retinal ischemia, which stimulate the production of VEGF, this promotes new vessel growth.These new vessels can obstruct the normal flow of aqueous humor, leading to increased intraocular pressure (IOP), which can cause damage to the optic nerve and loss of vision if untreated.

Aim

To study the role of intravitreal antivascular endothelial growth factor injection (Anti-VEGF) and its clinical outcomes in neovascular glaucoma

MATERIAL AND METHODS

This is a prospective and observational study conducted in the OPHTHALMOLOGY department MIMS, nellimerla from 1st June 2023 to 31st October 2024

Sample Size:- 50 subjects (58 eyes)

Inclusion Crieteria:- Patients diagnosed with neovascular glaucoma, typically secondary to retinal conditions. AGE:- >40years

Exclusion Cretieria:-

1. Any active intraocular inflammation (like anterior uveitis)
2. Recent ocular surgery (eg- cataract surgery, trabeculectomy, or vitrectomy)
3. Patient who didn't give their consent.

Methology

A total 58eyes of 50 patients with neovascular glaucoma are studied to observe the effectiveness of intravitreal Anti-VEGF (RANIBIZUMAB) injection.The study was concentrated on medical history, complete ophthalmological examination including

1. Visual acuity testing
2. Intraocular pressure recording
3. Gonioscopic evaluation
4. Detailed fundus examination

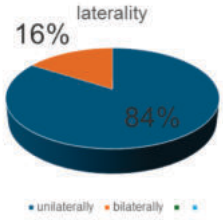
Patients with Intraocular pressure (>21mmhg) and significant anterior segment finding suggestive of neovascular glaucoma (NVI,NVA, fibrosis of the angle, hyphema, ectropion uvea) initially given topical beta blockers, topical and systemic carbonic anhydrase inhibitors to reduce IOP.

INTRAVITREAL RANIBIZUMAB injection (0.5 mg/0.05 ml) is given through the pars plana route and follow up of the patient is done (1WK,1MONTH, 3MONTHS, 6 MONTHS and 1 YEAR)

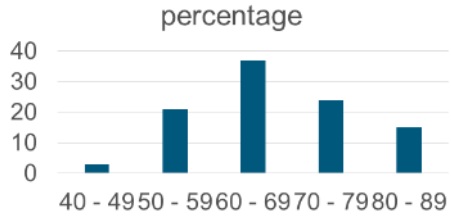
During follow up visual acuity testing, IOP recording, grading of neovascularisation is done.

RESULTS

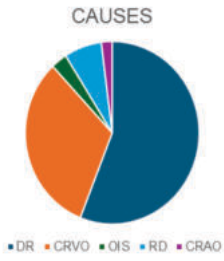
Out of 58 eyes in 50 patients with neovascular glaucoma, disease involvement is seen unilaterally than bilaterally.



Age distribution- most of the patients were between 60-69yrs (37%), 70-79yrs (24%), 50-59yrs (21%), 80-89yrs (15%) and 40-49yrs (3%).



NEOVASCULAR GLAUCOMA caused mainly due to DIABETIC RETINOPATHY (56%) CENTRAL RETINAL VEIN OCCLUSION (31%) OCULAR ISCHEMIC SYNDROME (3%)



RETINAL DETACHMENT (7%)CENTRAL RETINAL ARTERY OCCULSION (2%)

VISUAL acuity before giving intravitreal ranibizumab injection

VA	Before giving intravitreal ranibizumab
NO LIGHT PERCEPTION	17 eyes (29%)
LIGHT PERCEPTION	12 eyes (20.68%)
HAND MOVEMENTS	13eyes (22.41%)
CF 1METER	5 eyes(7.14%)
CF 2 METER	5 eyes (7.14%)
CF 3 METER	4eyes (6.89%)
CF 5 METER	2 eyes (3.44%)

There is an improvement of vision by 1-2 metres is seen in 54% of cases. There is no significant improvement of vision in 34% patients. Vision improvement >2mtrs seen in 12%.

The p value using chi square test is 0.878 which shows no statistical significance.

Follow up at 1st month after intravitreal injection, mean IOP was significantly reduced from 36.1 mmHg (range 17–60 mmHg) preoperatively to 15.6 mmHg (range 3–32 mmHg) ($P < 0.01$). After giving intravitreal injection, the mean reduction of 3-5mmhg is observed at 1st post operative day. Reduction in IOP followed by decrease in pain seen in 68%. Follow up after 1month there is decrease in IOP is seen. fter a mean follow-up of 1year , 53 eyes had controlled IOP (mean 12.1 mmHg, range 6–20 mmHg). Among which there was only 3 eyes which needed one anti-glaucoma medication [beta blockers]. Two eyes were considered as failure and needed surgery(like Glaucoma drainage devices, trabeculectomy).

Gonioscopic Evaluation:- divided into 3 groups: group 1 is Non specified status of the angle status, group 2 is open angles and group 3 is closed angles. NVI, NVA, NVE or NVD is seen in <25% of eyes in group 1 and 3 and 70-75% of eyes in group 2.

This reflects the poor visibility of the angle in these groups compared to open angles with clear cornea. Clinical features like AC flare is seen in 11-23% of eyes. In all eyes, the NVI (baseline mean NVI=2.64±1.11) rapidly regressed or disappeared without an IOP elevation within 1 week after first injection. But there was recurrence of NVI in second week (mean=1.12±0.93, p=0.0000) which was regressed completely after second injection.

At the end of 3 months, mean NVI was 0.52±0.59 (p=0.0000), suggestive of statistically significant effect of intravitreal Anti-VEGF on anatomical regression of NVI.

At the end of 3 months, there was complete regression of NVA in all the cases in which gonioscopy was possible.

DISCUSSION

Ranibizumab is an anti-VEGF which inhibits angiogenic activity and fibroblast proliferation. Both effects are critical for ocular neovascularization and wound modulation4.

The present study demonstrates that Intravitreal administration of Ranibizumab results in rapid regression of NVI and NVA in 3-7days.

Wolf S et al. shows IVB resulted in a marked regression of anterior segment neovascularization and relief of symptoms within 48 hours1.

In Palfi Salavat MC et al. study shows the regression of neovascularization was observed in the first 4-7 days after the injection with Avastin2.

Roberti G et al. study shows Anti-VEGFs as an adjunct to conventional treatment could help reduce IOP in NVG in the short term (four to six weeks), but there is no evidence that this is likely in the longer3.

In our study, mean reduction of 3-4mmhg is seen in 1st postoperative day followed by mean reduction of 12.1 mmHg in 1year.

Our study shows no significant improvement in visual outcome which is similar to that of Aparna rao et al. study5.

CONCLUSION

Visual morbidity by NVG remains as high as 75-90% in developing countries, even with the availability of anti-VEGF and after improved management / investigative at all stages. Anti-VEGF aims to stop progression of neovascularization, minimize the impact on quality of life, functional preservation of vision, and preservation of eyeball.

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