

## Efficacy of Intravitreal Bevacizumab in Vitreous Hemorrhage

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### Abstract

#### Aim

To evaluate the efficacy of intravitreal bevacizumab in improving visual outcome and preventing the recurrence in vitreous hemorrhage.

#### Setting

Manjunatha eye hospital, Kundapura, Udupi.

#### Design

Clinical prospective study

#### Materials and Methods

30 eyes of 30 patients were included in this study. 12 were females and 18 were males. All the patients underwent initial ophthalmological examination with visual acuity, refraction, anterior segment examination, intraocular pressure and dilated funduscopy. All the patients were given intravitreal injection bevacizumab 1.25mg/0.05ml on monthly basis. Patients were followed up 1 week post injection and visual acuity, anterior segment evaluation, IOP, posterior segment examination were done.

#### Statistical Analysis

Data was analyzed using descriptive statistics.

#### Results

30 eyes of 30 patients were included in this study. 12 were females and 18 were males. BCVA in all the 30 patients were less than counting fingers at half meters. Following 1st month, 13 patients had a BCVA better than 6/60. Remaining 17 patients had less than 6/60 BCVA. By the end of 3 months, 3 patients had BCVA less than 6/60, 15 patients had BCVA of 6/24-6/60, 8 patients had BCVA between 6/24-6/9 and 4 patients had 6/6 vision. By the end of 6 months, 11 patients had BCVA 6/60-6/24, 1 patient had 6/24-6/9 BCVA and 3 patients had BCVA of 6/9 and 5 patients had 6/6 vision.

#### Conclusion

Intravitreal bevacizumab is an effective way in improving visual outcome and in preventing the recurrence in vitreous hemorrhage. It also efficiently avoids the need of surgical intervention in any type of vitreous hemorrhage.

**Keywords:** Intravitreal Injection, Anti-VEGF, Vitreous Hemorrhage, Recurrence

### 1. Introduction

Vitreous hemorrhage is defined as the presence of extravasated blood in the vitreous cavity between the posterior lens capsule and zonules of the lens anteriorly, the non pigmented epithelium of ciliary body and ILM laterally, and the ILM posteriorly. The term encompasses hemorrhage into the Cloquet canal, the canal of Petit, and Bergers space and pre retinal (sub hyaloid and sub ILM) and intra vitreal or intra gel hemorrhage. Most common cause of vitreous hemorrhage is neovascularization [1,2]. Neovascularisation occurs as a result of ischemia due to various causes namely, Proliferative diabetic retinopathy, hypertensive retinopathy, anemic retinopathy, sickle cell retinopathy, Eales'

disease, old retinal vein occlusions etc. vitreous hemorrhage can also occur due to Posterior vitreous detachment with or without retinal tear, ocular trauma etc [3].

In our study, we had all the cases of vitreous hemorrhage were due to some or the other causes of neovascularisation.

Retinal ischemia results in pro-angiogenic environment resulting in increase in the levels of vascular endothelial growth factor (VEGF), basic fibroblastic growth factor, insulin like growth factor, all of which in-turn leads to angiogenesis [4,5]. These newly formed retinal blood vessels are fragile and often

bleed resulting in vitreous hemorrhage. Vitreous haemorrhage leads to sudden diminution of vision with or without floaters. Observation and surgical intervention have remained the principle management of VH. As the most common cause of VH is neovascularisation, use of anti-VEGF have shown to reduce neovascularisation and vascular leak. Multiple studies have shown the efficacy of intra vitreal anti VEGF agents in resolution of VH.

Hence in this study, we aimed to study the efficacy of anti-VEGF in improving the visual acuity and also in preventing the recurrence.

## 2. Objectives of the Study

1. To evaluate the efficacy of intravitreal bevacizumab in improving visual outcome and
2. To evaluate the efficacy of intravitreal bevacizumab in preventing the recurrence in vitreous hemorrhage.

## 3. Materials and Methods

A prospective observational study was conducted in 30 eyes of 30 patients attending the outpatient department of Manjunatha Eye hospital, Kundapura, Udipi. The study period was between 01/05/2022 to 30/04/2023. The patients were included in the study by applying the following Inclusion and Exclusion criteria.

### 3.1 Inclusion Criteria

Patients belonging to either sex irrespective of age who had vitreous hemorrhage due to PDR, Eales' disease, CRVO with NVE, hypertensive retinopathy who were attending outpatient department of Manjunatha eye hospital were all included in the study.

### 3.2 Exclusion Criteria

Vitreous hemorrhage associated with tractional retinal detachment,

### 3.3 Methodology

Patients fulfilling inclusion criteria were recruited into this study.

The aims and objectives of the intended study was properly

explained to the subjects and informed consent was taken. Data was collected as per the proforma sheet.

All the patients underwent initial ophthalmological examination with visual acuity, refraction, anterior segment examination, intraocular pressure and dilated funduscopy.

All the patients diagnosed with vitreous hemorrhage underwent following systemic examination and blood investigations prior to the procedure -

- a. Blood pressure test and physician evaluation,
- b. Random blood sugars,
- c. Glycated Hemoglobin(HbA1C),
- d. HIV and
- e. HbsAg.

### 3.3a Procedure

Under aseptic precautions, Intravitreal bevacizumab 1.25mg/0.05ml injected using a sharp tipped 30 guage needle in inferotemporal quadrant of the eye under topical anesthesia. Following injection, topical antibiotic was instilled and eye was patched for 2 hours. Oral acetazolamide 250mg tablet was given to all the patients after the injection.

Patients were followed up 1week post injection and visual acuity, anterior segment evaluation, IOP, posterior segment examination were done.

Patients were then followed up at 1month, 3months and 6months. Every follow up, patients underwent following tests- best corrected visual acuity, anterior segment, intraocular pressure measurement and dilated funduscopy.

Data was analyzed using descriptive statistics.

## 4. Results

A total of 30 eyes of 30 patients were included in this study. 12 were females and 18 were males. Causes of vitreous hemorrhage is tabulated in table no.1

Causes of VH	Total no of patients
PDR	22
HTN	5
Old RVOs	2
Eales' disease	1

**Table 1: BCVA in all the 30 patients were less than counting fingers at half meters**

All the patients were given intravitreal injection bevacizumab 1.25mg/0.05ml on monthly basis.

Causes of VH	No of cases	Total no. of Injections per patient
PDR	12	4
	5	5
	5	6
HTN	3	4
	2	3

Old RVOs	2	5
Eales' disease	1	3

**Table 2: BCVA at the end of 1month was as follows(table no 3)**

BCVA \ Cause of VH	Less than CF3mtrs	CF3m- 6/60	6/60-6/24
PDR (22)	6	7	9
HTN(5)		4	1
Old RVOs(2)			2
Eales'(1)			1
30	6	11	13

**Table 3: At the end of 3months, visual acuity was as table no.4**

BCVA \ Cause of VH	<6/60	6/60- 6/24	6/24- 6/9	6/6
PDR (22)	3	12	6	1
HTN(5)		2	2	1
Old RVOs(2)		1		1
Eales'(1)				1
30	3	15	8	4

**Table 4: At the end of 6months, BCVA was as shown in table no.5**

BCVA \ Cause of VH	6/60- 6/24	6/24- 6/9	6/9	6/6
PDR (22)	8	1	3	10
HTN(5)	2			3
Old RVOs(2)	1			1
Eales'(1)				1
30	11	1	3	15

**Table 5: By the end of 6months , VH had cleared in all 30patients. Total of 12 patients had BCVA less than 6/9. These 12 patients had cataracts of various grade which was the cause for not achieving 6/6 vision.**

These patients later underwent phacoemulsification with foldable IOL implantation under local anesthesia, following which 8 out of 12 patients attained BCVA 6/6. Remaining 4 patients had spongy macular edema, they were maintained on topical anti-inflammatory agent nepafenac 0.5% thrice a day for 6months duration.

All were followed up for a period of 1 year and there was no recurrence of vitreous hemorrhage.

## 5. Discussion

Prior to the advent of modern vitrectomy, observation with head end elevation was the only mode of managing vitreous haemorrhage. Observation and surgical intervention have remained the principle management of VH [1]. Surgical intervention requires the patient to be systemically stable as well as associated with a longer post operative recovery time as compared to an intravitreal injection, whereas an indefinite

observation period would be required in patients who are not systemically fit for surgery. An alternative in such cases was required to hasten the resolution of VH [1].

As the most common cause of VH is neovascularisation, use of anti-VEGF have shown to reduce neovascularisation and vascular leak. Multiple studies have shown the efficacy of intra vitreal anti VEGF agents in resolution of VH in proliferative retinopathy including Eales vasculitis and PDR with clearance rates as high as 92% of cases in less than 3 months [6-11].

In our study, VH was cleared in all our patients by 6months. Total of 12 patients had BCVA less than 6/9. These 12 patients had cataracts of various grade which was the cause for not achieving 6/6 vision.

These patients later underwent phacoemulsification with foldable IOL implantation under local anesthesia, following

which 8 out of 12 patients attained BCVA 6/6. Remaining 4 patients had spongy macular edema, they were maintained on topical anti-inflammatory agent nepafenac 0.5% thrice a day for 6 months duration.

All were followed up for a period of 1 year and there was no recurrence of vitreous hemorrhage. Anti VEGF agents are also commonly used prior to vitrectomy in patients with PDR to regress fibrovascular proliferation and neo vascularization, hence facilitating dissection of membranes and reducing intraoperative bleeding and postoperative rebleed. However, their use in advanced PDR may be associated with “crunch syndrome”, which is defined as the worsening of tractional retinal detachment in patients associated with sudden loss of vision within 1 and 6 weeks of injection [12]. We followed our patients for 1 year and none of them had developed crunch syndrome or worsening of tractional retinal detachment.



Figure 1

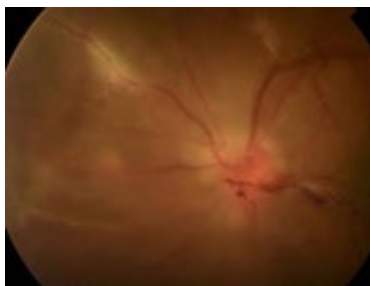


Figure 2

## 6. Conclusion

Intravitreal bevacizumab is an effective way in improving visual outcome and in preventing the recurrence in vitreous hemorrhage. It also efficiently avoids the need of surgical intervention in any type of vitreous hemorrhage.

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