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Research Article

Unveiling Bevacizumab's Hidden Powers in the Management of Primary Pterygium

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ABSTRACT

Background- Pterygium is one of the common ocular diseases, characterized by the triangular growth of fibrovascular conjunctival tissue starting from bulbar conjunctiva towards the cornea. Studies have shown the role of Vascular endothelial growth factor (VEGF) in the pathogenesis of pterygium, so we can presume that anti-VEGF drugs may be useful for pterygium patients**. Objective :** Off label use of bevacizumab in the management of pterygium. **Study Design:** Prospective Study. **Methodology:** This prospective study included twenty (40) eyes with primary pterygium and the effect of single dose of Bevacizumab (0.05 ml,1.25 mg) injected via subconjunctival route. The vascularity, thickness and size (in cm^2) was recorded at baseline and 12 weeks after injection. Change in size, vascularity and thickness were the major outcomes, which were noted. **Result:** Overall there were 32 females (80%) and 08 males (20%), with an average age of 41.5 yrs. No significant difference in the mean surface area of pterygium during the follow up was seen. However, significant difference in the vascularity and thickness was noted. At baseline, there were 28 (70%) grade 2 and 12 (30%) grade 3 pterygium. At 12 weeks post injection, there were 14(35%) with grade 1 pterygium, 20(50%) with grade 2 & 6 (15%) with grade 3 pterygium. There was no serious ocular or systemic side effect noted during the course of the study. **Conclusion:** Subconjunctival injection of bevacizumab is very effective in decreasing the thickness and vascularity.

Keywords*: Bevacizumab, Off label, Pterygium, Vascular endothelial growth factor, Subconjunctival injection.*

INTRODUCTION

The word pterygium has its origin from the combination of two greek words (pteryx) meaning wing and (pterygion) meaning fin.(**1,2**) It is among the most common ocular diseases, characterized by the triangular growth of fibrovascular conjunctival tissue starting from bulbar conjunctiva towards the cornea. It can cause dry eye, gritty sensation, and sometimes decreased vision due to astigmatism.

Pathogenesis of pterygium is not fully understood .The major risk factors which have been studied to play a role are environmental factors, immune mechanism ,genetic predisposition and chronic environmental irritation such as UV rays , hot and dry weather , wind, dusty atmosphere ,role of HPV virus is also implicated in various studies .Various growth factors have also been implicated in the pathogenesis ,among them the most important is VEGF, which is known to be produced in response to several stimuli including UV rays**. (3)**

Worldwide prevalence of pterygium vary widely from 0.3% to 29% while in India, it ranges from 9.5% to 13%.**(1)** Among Ophthalmologists worldwide, there is a lack of consensus on pterygium management in both medical and surgical terms. Studies have shown the role of VEGF in the pathogenesis of pterygium, so we can presume that anti-VEGF drugs may be useful for pterygium patients. Bevacizumab is a full length, humanized, monoclonal antibody, and it acts against all types of VEGF produced in the body. **(4)** It is US-FDA approved for the treatment of colorectal carcinoma.

Off-label drug use refers to the use of drugs outside the conditions of the product license in terms of dose, patient age, route of administration, indications and contraindications. Off-label use should always be based on sound scientific knowledge. **(5)** The aim of this study was to assess off label use of bevacizumab in the management of primary pterygium. The outcomes of the study were change in the thickness, vascularity and size of pterygium at 12 weeks, and to assess the post injection complications and adverse events.

METHODOLOGY

This prospective interventional study was conducted at Government Medical College Jammu during June-September 2023.The clearance from ethical committee was taken. A sample size of 40 patients, diagnosed as a case of primary pterygium were included in the study. Tan and coworkers in 1997 grading scheme was used to grade pterygium **(6)**

Grade 2 and Grade 3 were included in the study. Exclusion criteria were mainly grade 1 pterygium, hypertension, previous MI, Stroke, chemical injury, ocular surgery, trauma. All the eligible subjects were explained about the off –label use of the drug and informed consent was taken. Detailed Ocular examination including visual acuity, intraocular pressure, slit lamp examination, anterior segment photography was done. The size of pterygium was determined with the help of anterior segment photograph while patients were asked to look in the extreme horizontal gaze.

The injection of the bevacizumab was done in eye OT under the binocular microscope.

Eyedrops Moxifloxacin 0.5% 4 times were instilled 2 days prior to the intervention. Topical anesthetic Proparacaine 0.5% eye drops were instilled followed by scrubbing of eyelids by 10% povidone- iodine and 5% povidone- iodine in the cul de sac several minutes before the procedure. A sterile eyelid speculum was inserted. Inj bevacizumab(1.25 mg in 0.05 ml) was injected sub conjunctivally with 30-guage needle. After that, a sterile cotton bud was placed, a drop of povidone iodine was instilled. A sterile eye pad was placed for 2 hours. Topical antibiotic drops 4 times a day were prescribed for 1 week. Patient was kept on regular follow up on next day, at 06 weeks and at 12 weeks, and were assessed for events like subconjunctival haemorrhage, corneal epithelial defects, post-injection inflammation and infection.

Statistical Analysis

Data was analysed with the help of computer software MS Excel for windows and SPSS version 17. Analysis of variance (ANOVA) was used to compare numerical variables. Paired t-test was used for pairwise comparison. A p value ≤ 0.05 was considered statistically significant.

RESULTS

There were 32 males (80%) and 08 females (20%) comprising total 40 patients with a mean age of 41.5 yrs. Mean surface area at baseline and 12 weeks was 1.28±0.2 cm2 and 1.28±0.18 cm2 respectively, their difference being statistically insignificant. However, significant change in the thickness and vascularity of the pterygium was noticed**. (Figure 1&2)** At baseline, there were 28 (70%) grade 1I and 12 (30%) grade 3pterygium. At 12 weeks post injection, there were 14 (35%) with grade 1 pterygium, 20 (50%) with grade 2 & 6(15%) with grade 3 pterygium.(**Figure3**)

DISCUSSION

There is a definitive role of Anti VEGF in the pathogenesis of pterygium. **(6-9)** Bevacizumab is a humanized monoclonal antibody which has an antiangiogenic effect by blocking all forms of VEGF. There are several studies on the role of Anti Vegf in pterygium with good results. (**10-13**) In our study, subconjunctival injection of 1.25 mg in 0.05 ml. of bevacizumab was used for primary pterygium. It was observed that bevacizumab was more effective in the management of grade 2 and grade 3 pterygium which are fleshy and have more fibrovascular tissue. Subconjunctival hemorrhage in few patients was the only ocular complication which was observed and it is probably due to the injection process. No systemic complications was seen during the followup. Our results showed the role single intralesional injection of bevacizumab in pterygium grade 2 and 3 pterygium, by decreasing the vascularity and thickness after 12 weeks (Figure 1) . Further studies with longer follow up periods, and larger number of patients is needed to evaluate the effect of injection on pterygium recurrence

Figure 1- showing the effect of intralesional bevacizumab, a significant difference in the vascularity and thickness before and after injection is seen .

CONCLUSION

Subconjunctival injection of bevacizumab is very effective in decreasing the thickness and vascularity and thus helps in the regression of pterygium with no significant difference in the size of the pterygium at the end of 12 weeks.

Small sample size & short duration of follow-up are the limitations of this study. We need to study the results on a large population for a better outcome.

Conflict of interest: None
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