Short term changes in intraocular pressure following intravitreal injections of anti-VEGF Bevacizumab

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Abstract

Purpose -To assess the intraocular pressure changes after intravitreal injections of anti-VEGF(0.05ml bevacizumab)

Methods

It is a prospective interventional study done on patients who received intravitreal injections of 0.05ml (1.25mg) of bevacizumab. Overall 32 eyes of 32patients were injected. Intraocular pressure was measured pre-operatively, 10 min and 45min after the injection by Goldman ApplanationTonometer in sitting position. The fellow eye was taken as control.

Results

Overall 32 eyes of 32 patients were injected. The mean age was 63 years(ranging from 48- 88 years) with 62.5% of patients being males.Treated eyes had a mean IOP before injection of 16.2 ± 6.5 mmHg; after 10 min of injection it was 42.1 ±7.5 mmHg (P<0.001) and 19.2 ± 6.5after 45 min. In control eyes, the mean IOP before injection was 14.9 ± 6.0 mmHg, and after 10 min of injection, it was 17.5 ± 6.0 mmHg and after 45 min the IOP was 17.2 ± 2.5mmHg.

Conclusion

IOP increased remarkably immediately after intravitreal injection of bevacizumab but returned to safe range within 45 min of injection. None of the patients required paracentesis. Only 2 patients required IOP lowering medications.

Keywords Intraocular pressure, intravitreal injection

INTRODUCTION

Bevacizumab (Avastin® F. Hoffmann-La Roche Ltd., Basel, Switzerland) is a humanized monoclonal antibody that inhibits endothelial growth factor, and is rapidly becoming one of the leading treatments for neovascular age-related macular degeneration (AMD)1.There is growing evidence of the benefits of bevacizumab for treating other ocular diseases associated with neovascularization, such as diabetic retinopathy2. Also, bevacizumab has been reported to cause rapid regression of anterior segment neovascularization in eyes with neovascular glaucoma3.

Given the addition of fluid into the vitreous cavity, an increase in intraocular pressure (IOP) should be expected after intravitreal anti-VEGF delivery4. This is usually transient, but occasionally, it can persist. An acute IOP rise has been shown to decrease both optic nerve head and juxtapapillary retinal blood flow proportionally to the quantitative rise in IOP5. The axonal transport to the optic nerve head has also been proved to be blocked by an acute IOP increase in animal models. Knowledge of the IOP fluctuations after intravitreal injection allows ophthalmologists to make a clinical judgment regarding whether a patient with glaucomatous optic nerve damage may benefit from an anterior chamber paracentesis to avoid the damage associated with repeated episodes of high IOP.

METHODS

It is a prospective interventional study done on patients receiving intravitreal injection of bevacizumab in the ophthalmology department of Veer Surendra Sai Institute

of Medical Sciences and Research,Burla between March 1, 2016 and Aug 31, 2016. The study included patients who were at least 18 years of age and who had a diagnosis of active choroidal neovascularization or macular edema with clinical criteria for antiangiogenic treatment. Patients with previous ocular surgeries, with the exception of cataract surgery, or intravitreal injections of corticosteroids within the previous 3 months were excluded. Informed consent was obtained for each patient.

Intravitreal injections were given at the operating theatre by surgeons who were familiar with the procedure and used the same technique. Intraocular pressure was measured pre-operatively and after the injection by Goldman ApplanationTonometer in sitting position. The fellow eye was taken as control.

RESULTS

Overall 32 eyes of 32 patients were injected. The mean age was 63 years(ranging from 48- 88 years) with 62.5% of patients being males.19 eyes were phakic and 4 patients had previous history of glaucoma.

Table1- profile of patients

characteristics		**frequency**	**percentage**
Age(mean) in years		63.2 years	
Eye	OD	21	65.6
	OS	11	34.3
Sex	M	20	62.5
	F	12	37.5
Glaucoma	Present	4	12.5
	Absent	28	87.5
Phakic status	Phakic	19	59.3
	Pseudophakic	13	40.6

Treated eyes had a mean IOP before injection of 16.2 ± 6.5 mmHg; 10 min after injection it was 42.1 ±7.5 mmHg (P<0.001) and19.2 ± 6.5 after 45 min. In control eyes, the mean IOP before injection was 14.9 ± 6.0 mmHg, and 10 min after injection, it was 17.5 ± 6.0 mmHg and17.2 ± 2.5 mmHg after 45 min. The average increase

in IOP for eyes with glaucoma treated with bevacizumab was 8.25 mm Hg, and without glaucoma was 4.79 mm Hg.2 eyes with previously known glaucoma required IOP lowering agents to lower the IOP.

DISCUSSION

As intravitreal anti-VEGF injection becomes a more common treatment modality for various vitreoretinal diseases, there is increased concern regarding acute IOP elevation after intravitreal injection in relation to the acute increase in volume inside the eye. Several studies have examined post-injection IOP spikes and most revealed that IOP spikes are transient and additional intervention to lower the IOP, such as anterior chamber paracentesis, is not necessary. Kim et al investigated the short term IOP changes immediately after intravitreal injection of anti -VEGF founded a higher mean IOP change of 30 mmHg from baseline7.

CONCLUSION

Intravitreal injection of bevacizumab is safe with respect to short-term IOP changes, most of the IOP returned to a safe range (<25 mmHg) within 45 min. Elevated IOP 45 min after injection only occurs rarely, so routine prophylactic use of anti-glaucoma medication is not indicated. However additional studies addressing the possible loss of retinal ganglion cells with repeated intravitreal injections are needed.

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