

■ *Short Communication*

## Steroid induced ocular hypertension following pterygium surgery

BK Khatri<sup>1</sup>, H Ton<sup>2</sup>

<sup>1</sup>Consultant Ophthalmologist, Seva Sight Program, Cambodia

<sup>2</sup>Ophthalmologist, Battambang Ophthalmic Care Center, Cambodia

### Abstract

**Background:** Steroid induced glaucoma is an important cause of ocular morbidity and blindness. **Objective:** To determine the incidence of steroid induced ocular hypertension following pterygium surgery. **Methods:** A total of 202 eyes of 202 patients with primary pterygium which received steroid eye drops after undergoing surgical excision were selected. Pre-operative and post-operative intra-ocular pressure (IOP) were measured and followed up after 2<sup>nd</sup> and 6<sup>th</sup> weeks following surgery. **Results:** Ocular hypertension developed in 47 (23.27 %) eyes. The IOP returned to normal after two weeks following discontinuation of topical steroid drops (dexamethasone) and initiation of anti-glaucoma medication (Timolol drops 0.5% BD). **Conclusion:** Nearly one fourth of the patients receiving topical steroid following pterygium surgery presented with ocular hypertension. Measurement of IOP as early as 2 weeks of initiation of steroid drops helps identify steroid induced ocular hypertension.

**Keywords:** glaucoma, pterygium, ocular hypertension

### Introduction

Pterygium is a common eye disease in Cambodia. Pterygium excision with conjunctival free auto-graft is the treatment of choice. Topical steroid drops are used postoperatively to reduce inflammation and recurrence rate.

Elevated intraocular pressure persists as long as steroids are continued. Once the steroids are withdrawn, IOP returns to baseline levels within 10 days in approximately 98 % of the eyes. In the remaining population, it may even take up to 3 weeks. However, there have been few cases of irreversible IOP, ultimately requiring glaucoma surgery.<sup>2</sup>

The known risk factors for the steroid induced glaucoma are preexisting primary open angle glaucoma, family history of glaucoma, high myopia, diabetes mellitus, and young age.<sup>3</sup>

This study was carried out to determine the occurrence of steroid induced ocular hypertension following steroid eye drops use after pterygium surgery.

### Methods

Primary pterygium cases with no other ocular and systemic pathology were included. They were prescribed dexamethasone eye drops four times a day

Address for correspondence:

Dr Bal Kumar Khatri, MD

Consultant Ophthalmologist, Seva Sight Program Cambodia

Email: kcbalkumr@gmail.com

after pterygium surgery and followed up at sixth weeks. The subjects with known glaucoma were excluded.

An informed consent was taken from all the patients before their enrollment in the study. Pterygium excision with conjunctival auto-graft was performed on 202 eyes of 202 patients from July to September 2010 at Battambang Ophthalmic Care Center (BOCC), Cambodia. Dexacol (Dexamethasone + Chloramphenicol) containing 5mg of dexamethasone sodium phosphate and chloramphenicol 20 mg (1 drop) was used 4 times a day. Similarly, 1% tetracycline eye ointment was also used three times a day. Patients were discharged at the next day and follow up was done at week 2 and 6. IOP Check up before and after surgery was measured by The Icare® tonometer. IOP>21 mm of Hg was considered as ocular hypertension.

### Results

When intraocular pressure (IOP) was measured at week 2 during the follow-up, nearly 25% of the operated cases receiving topical steroid presented with ocular hypertension.

Steroid induced ocular hypertension is due to reduced aqueous humor outflow facility.<sup>1</sup>

Steroid responders (5% general population) may develop elevated IOP within a short time following steroid administration

**Age and Sex characteristics**

| Age Group    | Sex         |              | Total        |
|--------------|-------------|--------------|--------------|
|              | Male        | Female       |              |
| 20-39        | 22          | 22           | 44 (21.78%)  |
| 40-60        | 43          | 115          | 158 (78.22%) |
| <b>Total</b> | 65 (32.18%) | 137 (67.82%) | 202 (100%)   |

Ocular hypertension developed in 47 (23.27%) eyes overall.

At 2<sup>nd</sup> week: 10 eyes (22-28 mm of Hg) mean 23.8±2.2

At 6<sup>th</sup> week: 37 eyes (22-53mm of Hg) mean 28.7±7.7

IOP was lowered down to normal in all eyes after 2 weeks following discontinuation of topical steroids and initiation of anti-glaucoma medications.

**Discussion**

Topical steroid drop use for more than 2 weeks increases IOP in 18-36 % of the population and 46-92 % of patients with POAG.<sup>4</sup> Armlay (1963) in the 1960s reported that after receiving dexamethasone or betamethasone 3-4 times daily for 4 weeks, 34-42% of normal individuals demonstrated an IOP rise from a baseline value of 6 to 15 mm hg to a final level of 20-31 mm Hg.<sup>5</sup> The exact pathophysiology of steroid induced glaucoma is unknown. Based on histological studies<sup>6</sup> accumulation or deposition of extracellular matrix material, decrease protease and stromelysin activity, recognition of the TM cytoskeleton and DNA content, increased nuclear size and DNA content, decreased phagocytic activities and changes in the synthesis of specific proteins, and changes in the synthesis of specific proteins are considered as the pathogenetic mechanism of steroid induced glaucoma.

Increased laminin deposition is also reported to be responsible for decreased outflow facility both in steroid induced glaucoma and in primary open angle glaucoma.<sup>7</sup>

Dexamethasone treatment causes specific up regulation of glycosaaminoglycan or the TIGR (Trabecular meshwork –inducible glucocorticoid response)/MYOC (Myocilin) gene in the human trabecular meshwork cells but not in other cells. TIGR /MYOC is a 504-amino- acid secretory protein found normally in the ciliary body, human retina and optic nerve head astrocytes and skeletal muscles.<sup>8</sup>

The findings of our study showed that the IOP may rise as early as two weeks after steroid eye drop use.

But the likelihood of ocular hypertension increases with increase in duration of the steroid use.

**Limitation**

Having no control group and no visual field evaluation are the limitations of this study.

**Conclusion**

Topical steroid may cause ocular hypertension following pterygium surgery. Early detection, prompt treatment and close follow up are recommended. We suggest measuring IOP in all steroid using patients no later than 2 weeks after initiation of steroid treatment.

**Acknowledgement**

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