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Bilateral Steroid Induced Glaucoma in A 10-year-old Boy: A Neglected Common Case

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ABSTRACT

Introduction: Topical steroids are used in the treatment of various ocular disorders. However, it can cause numerous side effects. Steroid-induced glaucoma is the most severe complication of the unmonitored use of steroids. It is diagnosed by visual field defects, increased intraocular pressure (IOP), and glaucomatous optic neuropathy (GON) due to prolonged usage of steroids.

Case Presentation: a 10-year-old boy presented to the outpatient clinic in Undaan Eye Hospital complaining of headache, re dness and itchiness in both eyes. He started using dexamethasone 0.1% eye drops without a physician's supervision for the last 2 years. Steroid-induced glaucoma was diagnosed in both eyes. Topical and oral glaucoma medications were given. Both eyes IOP were still elevated in the following months. Trabeculectomy in both eyes was performed due to medically uncontrolled glaucoma. Furthermore, both eyes IOP were getting normal without any topical and oral glaucoma medications.

Conclusion: Unmonitored steroid usage must be avoided. This case suggests general practitioners and health care providers in the front line be aware of the usage of topical steroids. By increasing awareness concerning steroid-induced glaucoma, a patient's visual acuity can be saved, and irreversible blindness can be prevented, especially in children.

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INTRODUCTION

Steroids are one of the most frequently prescribed medications. It is used in various ocular and systemic conditions. Despite the fact that it has abundant benefits, steroids can cause numerous side effects on the eye. Steroid-induced glaucoma is the most severe complication of the unmonitored use of steroids [1,2,3]. In 59 children diagnosed with steroid-induced glaucoma, 87% had been prescribed with topical steroid [4]. Besides, topical steroids are also available in many drugstores. This accessibility contributes to overuse without monitoring by an ophthalmologist. The prolonged use of steroids may increase intraocular pressure (IOP). The IOP elevation leads to progressive damage of the optic nerve and visual field [5]. Glaucomatous optic neuropathy and glaucoma visual field defects are the signs of steroid-induced glaucoma due to prolonged IOP rise [5].

Steroid-induced glaucoma is a secondary open-angle glaucoma and is mostly associated with topical steroids but may also be related to systemic administration. It can also occur after intranasal, inhalational, systemic, and dermatological usage but is mostly seen after topical, periocular, or intraocular administration [5,6]. One-fourth of all acquired glaucomas in children were caused by steroid-induced glaucoma [7]. The increasing use of steroids increases the complication of steroid-related glaucoma and represents visual impairment worldwide [8,9,10].

Studies concerning steroid-induced glaucoma in children, especially in Indonesia, are still negligible. This study was considered to report one of the most dangerous side effects of steroids that lead to secondary glaucoma. Conceivably, this case report can highlight the role of healthcare workers, including general practitioners, nurses, and pharmacists in the front line, to be more aware of using steroid eye drops to prevent blindness in children.

CASE PRESENTATION

A 10-year-old boy presented to the outpatient clinic in Undaan Eye Hospital complaining of headache for 2 weeks. His mother stated that his son's eye frequently had redness and itchiness in both eyes before those complaints. He started using dexamethasone 0.1% eye drop, which his mother gave without a physician's supervision for the last 2 years.

Investigation

On the clinical examination, his visual acuity was 1/300 for the right eye and limited to light perception for the left eye. The IOP was 26 mmHg for the right eye and 57 mmHg for the left eye. The optic discs were almost cupping and pale in both eyes (Fig.1). He was given timolol 0.5% eye drop two times a day for both eyes, acetazolamide 2 x 125 mg orally, naphazoline HCL, pheniramine maleate eye drop six times a day for both eyes, and latanoprost 0.005% one time a day for both eyes. After a week, the right eye IOP was still elevated (45 mmHg). However, the left IOP is already in normal range (17 mmHg). Therefore, trabeculectomy for the right eye was performed. On the following day after surgery, his right eye IOP was 14 mmHg.

Treatment

One week postoperatively, both eyes' visual acuity were 1/300. The right eye IOP has already decreased (4 mmHg). Nevertheless, the left eye IOP remained elevated (43.4 mmHg). He was still prescribed topical and oral glaucoma medications for the left eye.

One month after the right eye surgery, the left eye trabeculectomy was performed (Fig.2). It was performed by creating a flap in the superior sclera, posterior to the limbus. A hole is made under the flap, and a small part of the iris is removed. Antifibrotic agent mitomycin C was administered by application of two to three soaked sponges. 30 ml of saline solution was irrigated in the surgical site. In addition, the conjunctiva and the flap were sewn back in place using 10.0 monofilament nylon sutures. Topical antibiotic was given six times a day for his left eye.

Outcomes and Follow Up

The following postoperative evaluation was done after one day, one week, and two weeks after surgery. His IOP decreased from 10 mmHg to 6 mmHg. The bleb was still formed (Fig.3). Topical and oral glaucoma medications were not prescribed after surgery.

DISCUSSION

Topical steroids are applicable medications in the treatment of numerous ocular disorders [10]. However, unmonitored use of steroids can lead to potential complications [11,12]. Some of these complications are steroid-induced glaucoma and cataracts [5].

Steroid-induced glaucoma is a type of secondary open-angle glaucoma due to the long-term use of steroids. Studies showed that steroids improve the deposition of debris and up-modulation of substance over the trabecular meshwork. This condition leads to morphological structural changes in trabecular meshwork, consequently increasing resistance to aqueous outflow [11,13].

We reported a case of steroid-induced glaucoma in both eyes in a 10-year-old boy demonstrating the disastrous effect of unmonitored and long-term use of steroids in children. The steroid was given by his parents without any evaluation by an ophthalmologist. Clinically presented to our center, the patient's both eyes were in visual impairment, presenting glaucomatous optic disc changes and increasing intraocular pressure. This rare case might be unnoticed until glaucomatous optic neuropathy is presented. The previous study reported that children are less frequently being steroid-induced glaucoma. Increased IOP can occur in all age groups. Besides, the most commonly occur in the elderly [14].

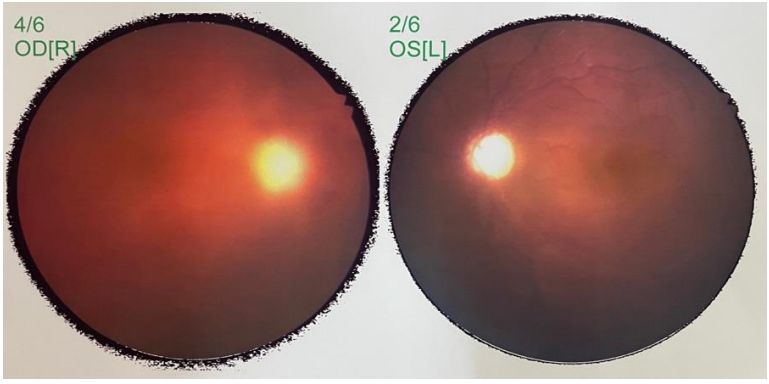


Fig.1. Fundus Image. Blue signs demonstrated cupping and pale of optic disc in both eyes

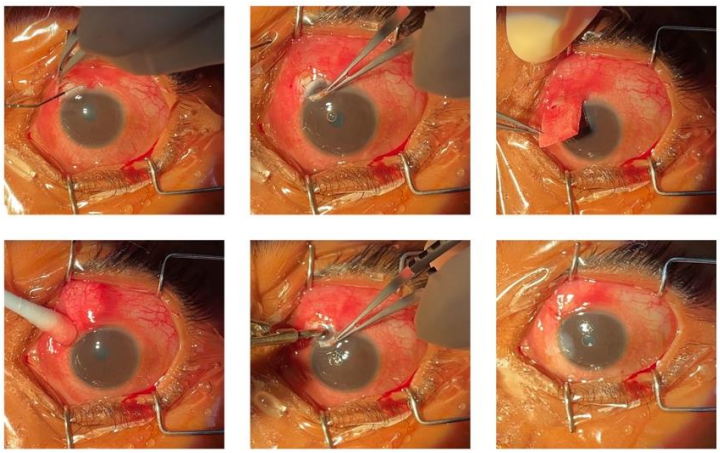


Fig.2. Clinical Images of Trabeculectomy

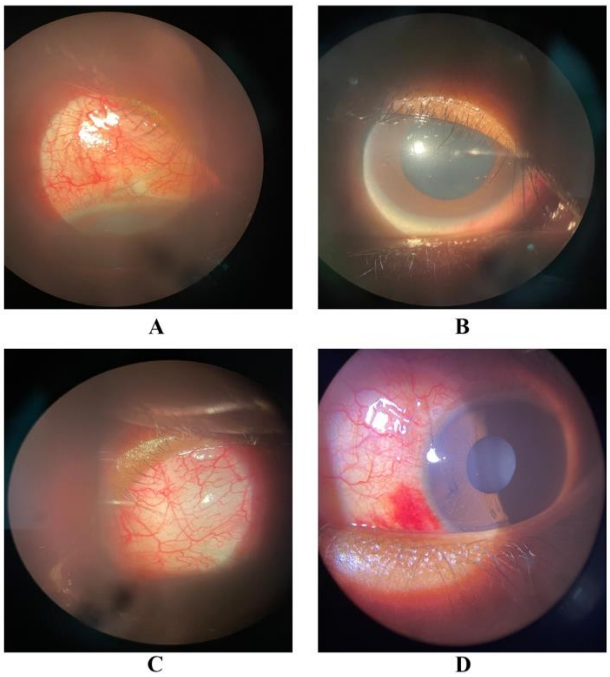


Fig. 3. (A,B) Postoperative evaluation of patient's right eye after 2 weeks; (C,B) postoperative evaluation of patient's left eye after 1 week

Exogenous steroid, which may be given topically, periocular, or systemically is the leading cause of steroid-induced glaucoma. On the other hand, endogenous steroids can also cause this condition [13,15]. Our patient also experienced an increase of IOP due to dexamethasone topical steroid. Corticosteroids like betamethasone, dexamethasone, and prednisolone have a consequential predilection to induce glaucoma [14,16]. On the contrary, fluorometholone and medrysone are less induced IOP elevations [14]. Studies reported that the highest IOP increase response is dexamethasone 0.1% [16,17,18]. Approximately 77.14% of patients using dexamethasone eye drops experience steroid-induced glaucoma [14].

Topical corticosteroids can lead to IOP elevation within 2 to 6 weeks. Furthermore, it may take a varied duration from 1 week to 5 years [14]. This can occur because most patients are asymptomatic at first and do not evaluate their IOP.

Treatment of steroid-induced glaucoma is firstly to stop the use of steroids and to decrease the IOP. Antiglaucoma medications are initially given to decrease the IOP. Surgical intervention such as trabeculectomy can be performed for medically uncontrolled glaucoma [19]. Trabeculectomy is the most

common surgical intervention for glaucoma, with a high success rate and low complication rate [20]. It is in line with our patient, who was successfully treated with trabeculectomy after oral medication failure. Surgical intervention must be performed immediately to prevent further optic nerve damage.

CONCLUSION

Steroid-induced glaucoma in both eyes, especially in children, is considered a rare condition that can lead to irreversible blindness. This case suggests general practitioners and healthcare providers be aware of the usage of topical steroids. Parents also should be informed of the danger of using topical steroids, especially in prolonged usage. We suggest that topical steroids should only be prescribed by ophthalmology with actual IOP follow-up. Self-medication must be avoided. By increasing awareness between general physicians and pharmacists concerning steroid-induced glaucoma, a patient's visual acuity can be saved, and irreversible blindness can be prevented.

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CONFLICT OF INTEREST

The authors declared there is no conflict of interest.

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