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CATARACT;

CORTICOSTEROID INDUCED INTRAOCULAR PRESSURE ELEVATION AFTER EXTRACTION

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ABSTRACT... Objective: To observe the tendency of corticosteroids to raise the intraocular pressure after prolonged use of 0.1% dexamethasone eye drops during post operative period of cataract extraction. **Study Design:** Observational study. **Period:** From August 2008 to December 2009. **Subjects and Setting:** In the study 50 patients were included. These patients had age related cataract in one or both eyes. The IOP of every patient was measured preoperatively with the help of Goldman applanation tonometer. After cataract extraction, every patient received 0.1% dexamethasone eye drops four times a day for one month. The IOP was measured fortnightly. **Setting:** Department of Ophthalmology, Allied Hospital, Faisalabad and the clinics of the authors. **Results:** Topical administration of 0.1% Dexamethasone Eye Drops ,four times a day for one month after age related cataract extraction caused elevation of intraocular pressure more than 21 mm Hg in 8% of general population.

Key words: Corticosteroid, Intraocular pressure (IOP), Cataract extraction.

INTRODUCTION

Cataract is one of the most common ocular diseases all over the world. As compared with the incidence in USA[1,2,3] it is about three times more common in subcontinent including Pakistan. Here the incidence is 14.7% in people aged 50 to 59 years, while 42% in 60 to 69 years and 87.7% among those aged 79 years or older[4]. Ultraviolet light, as has been implicated in cataract formation, does not appear to be of major importance in cataractogenesis[5] in Pakistan. Cataract extraction is the commonest surgical procedure in Ophthalmology and perhaps common than any other procedure in any branch of medicine[6]. It is well established that one third of general population is corticosteroid responder especially the patients of glaucoma, relatives of glaucoma patients, older patients, high myopes, and diabetics. The corticosteroids lead to an outflow obstruction to aqueous humor at the level of trabecular meshwork because of deposition of abnormal proteins and glycosaminoglycans in trabeculum[7]. Most effective treatment of corticosteroid induced IOP elevation is discontinuation of the drug.

The intraocular pressure generally returns to normal level within a few days to weeks, although it may take months or years[8]. In some patients elevation of IOP may persist even after discontinuation of steroid therapy. In such cases topical anti glaucoma medication may be required.

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Argon Laser Trabculoplasty has variable success in treating corticosteroid induced glaucoma. However, if progressive optic nerve cupping and visual field loss develop, filtration surgery is indicated[9].

METHODS AND SUBJECTS

A total 50 subjects were included in this observational study. 20 patients were male and 30 patients were female. All patients were more than 40 years of age, ranging from 41 to 79 years .The mean age was 57.76 years. The subjects were selected by simple random technique. All patients were admitted with diagnosis of senile cataract. All patients had two functioning eyes with good vision except the visual deficit caused by senile cataract. The fundus examination of all the patients was performed after dilatation of pupil with tropicamide 1 % eye drops with the help of slit lamp to see any signs of present or previous glaucoma. The patients with optic nerve abnormality were excluded from study.

The intraocular pressure (IOP) was measured with Goldmann applanation tonometer. Proparacaine 0.5% eye drops were instilled 3 times after every five minutes, then tear film was stained with fluorescein strips and IOP was measured in cobalt blue light with slit lamp. The IOP of all patients was less than 21 mm Hg ranging from 8 to 18 mmHg (average 12.40 mm Hg).

The gonioscopy was performed with Goldmann 3- Mirror Goniolens to confirm the open angle of the anterior chamber. All the patients had wide open angle of grade 3 and 4 by Shaffer's grading system. Those patients were excluded who had previous history of glaucoma, IOP more than 21 mm Hg, any sign of uveitis, or abnormal or closed angle of anterior chamber. There were four diabetics and six having family history of diabetes mellitus. No patient had family history of glaucoma while two patients were myopes. All the patients underwent Phacoemulsification or extracapsular cataract extraction with posterior chamber intraocular lens implantation. From 1st post operative day, 0.1 % dexamethasone eye drops were started 4 times a day. All patients with any complication during or after surgery that could have affected the IOP, were excluded from the study. Topical administration of 0.1 % dexamethasone eye drops 4 times a day was continued for 1 month. All the patients were advised to come for follow-up post operatively. Complete slit lamp examination was performed and IOP was measured with Goldman applanation tonometer fortnightly for 1 month.

RESULTS

Preoperatively all patients had IOP < 21 mm Hg. The IOP range was from 8 to 18 mmHg. The average IOP was 12.40 mmHg. There was no patient who got an acute rise of IOP resembling acute angle closure glaucoma during early days of corticosteroid administration. After continuous instillation of 0.1% dexamethasone 4 times a day for 1 month, two patients had IOP more than 30 mmHg; one patient had 32 mmHg and other had 34 mmHg. Two patients had IOP more than 21 mmHg but < 30mm Hg; one had IOP 24 mmHg and other had 26 mmHg. 36 patients had IOP more than their pre operative readings but less than 21mmHg. 6 patients did not show any change in IOP, their final readings were same as preoperative readings.

Four patients had final readings less than their preoperative readings. On average preoperatively mean IOP value was 12.40 mmHg. After 1 month of continuous topical administration of 0.1% dexamethasone 4 times a day, their mean value of IOP was 15.56. So the average increase in IOP was 3.16 mmHg as shown in Table I.

Table-I. Distribution of the patients with IOP after instillation of 0.1% dexamethasone.

Range of IOP	No. of Patients	%age
> 30 mmHg	02	04
21-30 mmHg	02	04
Base line value to 21 mmHg	36	72
No change in IOP	06	12
< Base line IOP	04	08
Total	50	100

DISCUSSION

Topical corticosteroid eye drops are prescribed for every patient who undergoes cataract extraction to suppress the postoperative ocular inflammation. There are so many reports from all over the world which show that prolonged topical administration of corticosteroid can cause elevation of IOP. In 1954, Francois published the first report of IOP rise following prolonged use of corticosteroids[10]. In 1991, Ohji et al[11]and in 1992, Jannus[12] and Barlett JD[13] reported IOP rise after prolonged corticosteroids therapy. In April 2009 Erdurmus, Mesut MD. Et al reported the incidence of postoperative IOP rise more than 22 mmHg in 22% patients and more than 30 mmHg in 6% patients[14]. As compared with our results the incidence of high responders is almost the same in both studies, while the incidence of moderate responders was more (22%) than our result (4%). This difference may be due to the difference of the base line IOP of these patients. These results are comparable but slightly different than our results. It is well established that about one third of the general population is corticosteroid responder especially the patients of glaucoma, the relatives of glaucoma patients, older patients, high myopes, and diabetics[7]. The exact mechanism of increased IOP caused by corticosteroids is not known[13]. Several mechanisms have been proposed to explain this complication. It has been found that trabecular and endothelial tissues posess specific steroid receptors[15].

In 1989 Philips tried to block these corticosteroid receptors with mifepristone and concluded from his study that mifepristone can block the ocular hypertensive effect of progesterone and positively can block the effect of dexamethasone[16]. The most commonly accepted hypothesis is that glycosamnoglycans accumulate in the out flow pathways causing an increase in out flow resistance[I7]. Another explanation is that corticosteroids inhibit prostaglandin synthesis by human trabecular cells. Dexamethasone can inhibit synthesis of both prostaglandins whose normal functions is to lower IOP by increasing outflow facility. These prostaglandins are PGE2 and PGF2[18].

CONCLUSION

According to the results of our study the incidence of postoperative corticosteroid induced IOP elevation is 8% after continuous topical administration of 0.1 % dexamethasone eye drops four times a day for one month. The incidence of high response (IOP more than 30 mmHg) is 4% while the incidence of moderate increase in IOP (between 21 and 30 mm Hg) is also 4%. According to the results of this study there are definite chances of postoperative corticosteroid induced elevation of IOP. This aspect of postoperative corticosteroid administration should be kept in mind. So that there could be ultimate better outcome of so sophisticated and advanced surgical procedure. Careful and ongoing observation of IOP throughout the prolonged follow-up period is recommended for these individuals with prompt attention to treatment of raised IOP.

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