

Incidence of Glaucoma in Patients Using Topical Steroids Eye Drops

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Abstract:- Topical corticosteroids are used as anti-inflammatory agents for treating ocular conditions. Excessive unmonitored use of steroids results in undesirable side effects which include cataract and glaucoma [4]. This article describes the incidence of glaucoma in patients using topical corticosteroids over a period of few weeks.

Keywords:- Glaucoma, Topical Steroids, Intraocular Pressure, Inflammation.

I. INTRODUCTION

Intraocular hypertension can occur as an adverse effect of corticosteroid therapy. Different methods of steroid administration has shown to increase the intraocular pressure. In steroid responders, the IOP rises after a few weeks of continued therapy and returns to normal after stopping the therapy [2].

Patients with family history of glaucoma are at higher risk for developing corticosteroid-induced ocular hypertension[17,18]. Armanly and Becker [5] and Becker [6] independently reported that the normal population of individuals exposed to steroids can be divided into 3 categories: (1) high responders, developed IOPs greater than 31mm Hg; (2) moderate responders developed IOPs between 20-31 mm Hg; (3) non responders had IOPs less than 20 mm Hg.

The most common route of causing iatrogenic glaucoma is by intraocular, periocular or topical administration of corticosteroids [3]. The glaucoma response is mostly reversible and if intervened at an early stage can prevent vision threatening complications[4]. The purpose of this review is to find out the incidence of glaucoma in individuals who have been exposed to continuous therapy of topical steroids, especially in post-operative patients after eye surgery.

II. TIMING OF RESPONSE

Although many studies have reported that ocular hypertension occurs 3-6 weeks after steroid usage, some elevation in IOP is found in most patients within the 1st or 2nd week [7-10]. Armanly reported that there is an average increase in IOP of 19% at the end of first week [7,8].

Francois reported that the time of onset of glaucoma was dependent on the potency of the steroid used [11]. In steroid responsive patients, the IOP may increase within a few hours after administration. However, the IOP normalises within 1 to 4 weeks after discontinuing the drug [3].

III. RISK FACTORS

There is increased probability of glaucoma in the following cases: cases with primary open angle glaucoma or glaucoma suspects, first degree relatives with POAG [12], age of the patient (old age or less than 6 years), connective tissue disorders[13], high myopia [14,15] and angle recession glaucoma [16].

IV. METHODOLOGY

A prospective study was conducted at Saveetha Medical College and Hospital for a period of 6 months (from January 2019 to June 2019). The review involved collecting the IOP values for post operative patients who were using topical steroids eye drops in the ophthalmology in-patient ward for 200 patients along with their demographic details. Inclusion criteria was all post-op patients who were on continuous steroid treatment for three weeks. The IOP was measured in both the eyes using Non contact tonometry. This study was adhered to the tenets of our Institutional Review Board (IRB) and Ethics committee (IEC). The study population consisted of 200 patients undergoing topical steroid treatment. The study group was further classified based on the age-groups, gender and IOP values for both the eyes. The values were tabulated in an Excel sheet and the incidence of glaucoma amongst these patients was calculated. Statistical analysis of the same was done by calculating the incidence rates of glaucoma using the patient's intraocular pressures in both the eyes.

V. RESULTS

Table 1: Totally, 200 patients were studied for the incidence of glaucoma. The study population comprised of 97 males and 103 females within the age group of 21-87 years. The IOPs in the right eye varied from 10-29mmHg and left eye 11-32mmHg. All the patients used the same steroid Prednisolone.

		N
Total		200
Gender (M:F)		97:103
Age (years)		21-87
IOPs (in mmHg)	Right eye	10-29
	Left eye	11-32
Drug used		Prednisolone eye drops

Table 1:- Demographic details of the subjects

No. of people with glaucoma	No. of people without glaucoma
14	186

Table 2:- Number of subjects affected after topical usage of steroids

Incidence rate is a measure of the number of new cases per unit of time. Overall incident rate of glaucoma in

200 subjects was calculated to be **15/11.538 person years of observation.**

	Male	Female
Incidence rates	9/5.596 person years	6/5.942 person years

Table 3:- incidence rate of glaucoma in males and females

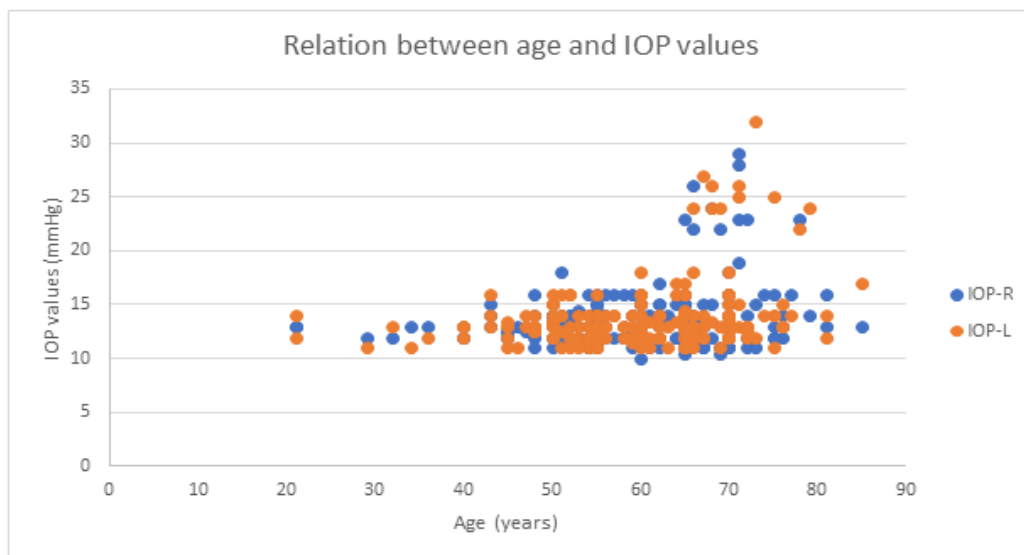


Fig 1:- Association between age and intraocular pressure – The rise in IOPs is more evident in older age groups than younger ones.

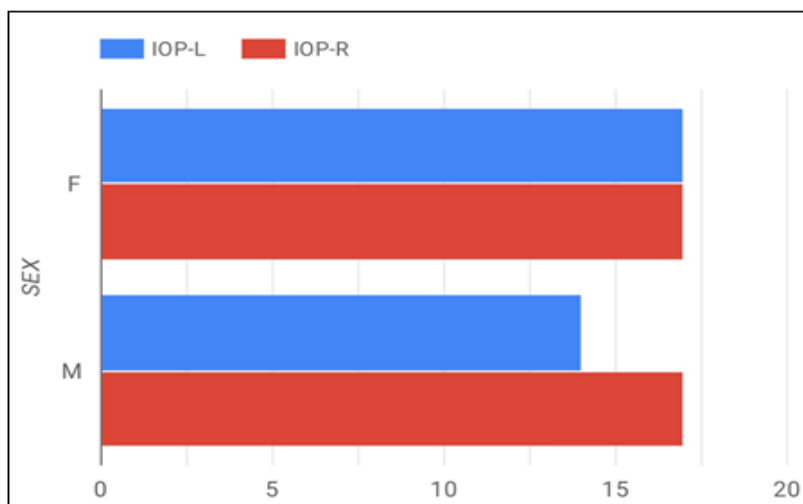


Fig 2:- Intra ocular pressure variations in males and females-

VI. DISCUSSION

The study was carried out to find the incidence rate of glaucoma in steroid using patients. Since the time period of steroid usage was only three weeks, the incidence rates are not very significant. Out of the 200 cases that were studied for IOP elevation, the number of people affected with glaucoma were 14. Overall incident rate of glaucoma in 200 subjects was calculated to be 15/11.538 person years of observation.

From the above study, it is evident that rise in intraocular pressure is more significant in older age groups (60-100 years) compared to younger ones. This is in correlation with previous studies which have proved that the effect of steroid induced glaucoma is greater in older age groups.[7]

The incidence rates amongst males and females showed a slight variation. The incidence rate amongst males was found to be 9/5.596 person years. The incidence rate amongst females was found to be 6/5.942 person years. This indicates that there is a higher incidence of glaucoma amongst males. However, earlier studies indicate that women are at higher risks for angle closure glaucoma, but there is no clear sex predilection for open angle glaucoma[19].

VII. CONCLUSION

The exact mechanism of steroid-induced glaucoma is not yet known. It is important to identify those patients who have an early intra ocular pressure rise after instilling corticosteroids in order to prevent them from developing permanent visual loss. Prevention of steroid induced glaucoma can be achieved by identification of risk factors and continuously monitoring the IOPs in case of long term therapy.

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