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Original Research Article

Comparative Study of Effect of Topical Corticosteroid Vs Combination of Corticosteroid with Non-Steroidal Anti Inflammatory Agents on Post-Operative Inflammation after Cataract Surgery

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Abstract:

Background: In India, cataract-related blindness is a major social, economic, and medical burden as well as a major cause of human illness. According to a survey conducted by the WHO and NPCB (National Programme for Control of Blindness), India has a backlog of over 22 million blind eyes and 12 million blind persons, 80.1% of whom are blind as a result of cataract.

Objective: To evaluate the comparative effectiveness of topical NSAIDs in combination with topical corticosteroids versus topical corticosteroids alone in controlling intraocular inflammation after uncomplicated phacoemulsification.

Methodology: Totally, 100 patients undergoing phacoemulsification with posterior chamber intraocular lens implantation were randomly assigned to receive either nepafenac 0.1% 3 times daily plus 1% prednisolone eye drops for 1 month or 1% prednisolone eye drops only as their postoperative anti-inflammatory medication with 50 cases in each group. The patients were examined at the 1st day (baseline), 1st week, 2nd week, and 4th week after surgery. Postoperative inflammation was evaluated subjectively by intraocular pressure, slit-lamp assessment of signs of inflammation, including conjunctival hyperemia, ocular pain, and aqueous cells and flare.

Result & Conclusion: We would want to draw the conclusion that there were no differences between groups randomly allocated to Corticosteroid monotherapy or combination treatment with NSAID & steroid in treating early inflammation following cataract surgery.

Keywords: Cataract, NSAID, Prednisolone, Eye Drops.

Introduction

The most frequent surgical operation globally is cataract surgery. Its main goal is to enhance patients' visual abilities. A postoperative inflammation is brought on by the procedure's breakdown of the blood-aqueous barrier and intraocular release of crystalline lens particles. [1,2] The inflammation can cause additional vision-disturbing complications, such as posterior synechia, secondary glaucoma, posterior capsular opacification, and pseudophakic macular oedema (PMO), if it is not adequately treated. This lowers patients' quality of life and raises costs for the healthcare system significantly. [3] The use of topical medicines both before and after modern cataract and lens surgery frequently helps the surgical process. In order to adjust intraocular pressure (IOP) during the perioperative period, these topical treatments may include antibiotics, steroids, Nonsteroidal anti-inflammatory drugs (NSAIDs), and the whole spectrum of glaucoma medications. NSAIDs are widely regarded as an essential tool by surgeons for achieving the best surgical results during both straightforward and challenging cataract operations. In the topical prevention and therapy of noninfectious ocular inflammation and cystoid macular edoema, NSAIDs have been shown to be a secure and productive substitute for corticosteroids (CME). [4,5] They have also been valued as a means of maintaining intraoperative mydriasis and

moderating postoperative pain. Whether used alone, synergistically with corticosteroids, or for specific high-risk eyes prone to the development of CME, the effectiveness of these medications is compelling. [6]

Material & Methodology

This prospective Cross sectional was conducted on 100 patients attending the Eye OPD in ophthalmology department of Govt Medical College, Ratlam, and Madhya Pradesh, India from Dec 2021- Dec 2022 with a clinical diagnosis of ocular cataract requiring surgical removal with 50 cases in each group.

All patients who had undergone phacoemulsification with posterior chamber intraocular lens implantation have been randomized to receive NSAIDs drops plus Steroid Drops or Only steroid drops.

5o cases Received nepafenac 0.1% 3 times daily plus 1% prednisolone eye drops for 1 month postoperatively(Group A) and another 50 cases Received1% prednisolone eye drops only for 1 month postoperatively.(Group B)

Postoperative inflammation was evaluated subjectively by intraocular pressure, slit-lamp assessment of signs of inflammation, including conjunctival hyperemia, ocular pain, and aqueous cells and flare.

Exclusion criteria:

Topical/inhaled/systemic steroid 14 days before surgery, topical/inhaled/systemic NSAIDs within 7 days of surgery, eyes with cells and flare and ocular pain in preoperative baseline examination, corneal opacity, suspected hypersensitivity to NSAIDs, chronic or recurrent inflammatory eye disease, diabetic patient, severe dry eye patient, cases in which there is intraoperative complications, glaucoma patient, patient having macular pathology. The allotment of the patients in the 2 groups was done by randomization. Simple randomization method was used, in which patients were chosen by assigning random numbers taken from a random numbers table of a statistical textbook.

Any sign of active ocular inflammation (redness, edema, tearing, or discharge) was documented. Conjunctival hyperemia was evaluated by slit-lamp examination and classified from 0 (no edema) to 4+.

Grading of anterior chamber cells was done using the narrowest slit of the slit lamp (1-mmwide, 1-mm high), the number of cells per high-power field in the anterior chamber was counted and recorded on a scale, where Grade 0 represented ≤5 cells, Grade 1 represented 5–10 cells, Grade 2 represented 11–20 cells, Grade 3 represented 21–50 cells, and Grade 4 rep-resented ≥50 cells.

Grading of aqueous flare: Five-point scale from 0: Nil (media clear), +1: Iris details, just detectable, +2: Moderate (iris andlens details clear), +3: Marked (iris and lens details not clear), +4: Intense (fibrinous exudate).

The intraocular pressure (IOP), visual acuity, slit-lamp examination, and fundoscopy were done at each visit. The measurement of IOP was done by Goldman applanation tonometer available in the department. Patients in four groups were followed postoperatively for any intraocular inflammation on the 1 day, 1 week, 2 week, and 4 week.

Results

This prospective Cross sectional includes 100 patients of cataract of age Group 40-70 years of age groups.

Among them Majority of them were Male (60%) and rest were female (40%). The mean age group was 58± 5.6 year.

Table 1: Baseline characteristics and use of phacoemulsification energy

characteristic	Group A (nepafenac 0.1% 3 times daily plus 1% prednisolone eye drops)	Group B (prednisolone eye drops)
Participants, n	50	50
AC flare, median (IQR)	9.9 (7.8, 12.6)	10.2 (7.5, 13.0)
VA (logMAR), mean (SD)	0.31 (0.15)	0.28 (0.14)
IOP (mm Hg), mean (SD)	15.3 (4.1)	15.4 (3.8)
AREDS, median (range)	2.0 (1.0, >3.0)	2.0 (<1.0, >3.0)
CDE, median (IQR)	8.6 (6.1, 11.4)	7.8 (5.6, 10.8)

There were no differences in vision findings in the patients under the study at various time intervals across groups. The mean IOP at various time intervals was comparable in all the groups under our study. Further, it was observed that the comparison of IOP at various time intervals among the was not significant.

Table 2: Postoperative results on AC flare and cells in AC at 3rd postoperative day(P value less than 0.05 significant)

characteristic	Group A (nepafenac 0.1% 3 times daily plus 1%prednisolone eye drops)	Group B (prednisolone eye drops)	P value
AC flare, median (IQR)	17.1 (16.1, 20.2)	18.6 (17.5, 22.0)	0.175
Cells in AC	3.9 (3.3, 4.4)	4.1 (3.4, 4.5)	0.200
IOP (mm Hg)	14.4 (12.8, 14.0)	15.0 (10.4, 11.6)	0.506
VA (logMAR)	0.11 (0.06, 0.13)	0.10 (0.06, 0.13)	0.860

Anterior chamber flare grade: There was no significant difference observed between groups. (p value <0.175) (Table 2).

Anterior chamber cells: There was no significant correlation between the anterior chamber cell grades among the groups. The overall ocular pain score was comparable between two groups however, there was no significant difference observed between Group.

The mean IOP at various time intervals was comparable in all the groups under our study. Further, it was observed that the comparison of IOP at various time intervals among the two groups was not significant.

Postoperatively, visual acuity improved significantly in all groups from a baseline mean at 0.31 logMAR but there were no statistically significant differences between the groups.

Discussion

Modern developments in cataract surgery, including advancements in surgical tools and methods like phacoemulsification, have reduced physical surgical stress and the generation of prostaglandins, the primary mediators of postoperative ocular inflammation. Nonetheless, surgical inflammation still contributes to patient pain, a slower rate of recovery, and occasionally, subpar visual outcomes. If left untreated, this inflammation may hinder patients' recovery or perhaps aid in the emergence of another problem like cystoid macular edema (CME). After cataract surgery, noninfectious ocular inflammation is frequently managed and prevented with topical nonsteroidal anti-inflammatory medications (NSAIDs) and steroids. Clinical data indicates a synergistic relationship between the use of steroids and NSAIDs. [7]

We found no statistically significant differences between combination of steroid and NSAID eye dropsand NSAID eye drops alone, Although we did not find an increase in IOP in groups receiving steroids, we found a statistically significantly lower reduction in postoperative IOP in these groups. Visual acuity improved in all participants with no statistically significant differences compared with the control subjects.

Postoperative inflammation causes breakdown of the blood–ocular barrier and might lead to complications. It is, therefore, highly relevant to test the efficacy of prophylactic anti-inflammatory regimens on early postoperative inflammation. We used an objective measurement: flare photometry.

The rate of anterior chamber cell loss served as the primary efficacy indicator. After the first postoperative day, slit-lamp examination revealed a steady decline in anterior chamber cell count, indicating that the inflammatory reaction was under control in both groups. Previous research has shown that moderate tapering is the most effective way to prevent ocular rebound inflammation, which can appear after quick tapering or abrupt cessation of topical ocular steroid treatment. [8,9] The processes through which ocular disease relapses may occur after steroid cessation are currently unknown. After cataract surgery, topical corticosteroids are frequently used as a standard treatment for a period of several weeks to reduce the inflammatory response.

We discovered that 100% of participants in the group receiving nepafenac 0.1% had a normal IOP throughout all four visits. Nepafenac was also proven to be efficient and secure in reducing postoperative ocular discomfort and inflammation. Nepafenac 0.1% was shown to be superior to the placebo group in preventing and treating ocular inflammation in a research by Lane et al. [10] and Stewart et al. [11].

In our investigation, we discovered that prednisolone 1% was more efficient at lowering anterior chamber cells and flare while managing postoperative intraocular inflammation. In a research conducted by Simone et al. [12], it was shown that prednisolone acetate was superior than ketorolac on day 7 following cataract surgery for lowering intraocular inflammation, albeit this difference vanished by day 28. Ketorolac tromethamine 0.5% may be just as efficient and secure as prednisolone acetate 1% in reducing inflammation after cataract extraction, according to a research by el-Harazi et al. [13].

Conclusion

We would want to draw the conclusion that there were no differences between groups randomly allocated to Corticosteroid monotherapy or combination treatment with NSAID & steroid in

treating early inflammation following cataract surgery.

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