

Evaluate the Efficacy of Intracameral and Sub-Conjunctival Dexamethasone in Preventing Postoperative Inflammation in Patients Undergoing Cataract Surgery

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ABSTRACT

Objective: This study aims to assess the efficacy of injecting dexamethasone intracamerally and subconjunctivally into individuals having cataract surgery in order to lower the risk of inflammation following the procedure.

Methods: This study included 160 patients, who underwent cataract surgery and were no older than 14 years. Group I consisted of 80 patients who got subconjunctival dexamethasone, whereas group II, also consisting of 80 patients, received intracameral injections of dexamethasone. On the first and third post-operative days, slit lamps were used to examine post-operative inflammation. SPSS 24.0 was used to analyze all data.

Results: A significant difference was identified between the two groups, with a p-value of less than 0.005. In group I, postoperative inflammation was found in 25 patients, which accounts for 31.3% of the total, while in group II, it was found in 5 patients, which accounts for 3.8% of the total.

Conclusion: It was determined that intracameral injection of dexamethasone is far more successful than sub-conjunctival injection for preventing inflammation after cataract surgery in youngsters.

Keywords: Intracameral, Post-operative Inflammation, Cataract surgery, Sub-conjunctival, Dexamethasone

INTRODUCTION

Synechial development, secondary glaucoma, cystoid macular oedema (CME), and posterior capsule opacification (PCO) are among complications that might increase the risk of intraocular surgery (IOP), postoperative inflammation can prolong the healing process, and increase inflammation overall. Recent advances in surgical techniques, surgical instruments, and intraocular lens (IOL) engineering have reduced the amount of inflammation following cataract extraction¹ Preoperative pharmacologic treatment and prophylaxis currently include the use of topical corticosteroids and non-steroidal anti-inflammatory drugs. It is difficult to get patients to take their prescribed eye drops as directed because of the frequency and duration of dosing required to alleviate inflammation following surgery. There are a number of factors that decrease the efficacy of topical medicines, including corneal absorption, significantly variable intraocular concentrations over the treatment course, and poor compliance. a subsequent Therefore, there is an opportunity to enhance the management of inflammation following surgery^{2,3} Recently published articles have revealed the efficacy of various steroid delivery techniques in reducing inflammation following cataract surgery in eyes that are otherwise healthy. Injecting triamcinolone acetonide (TA) into the posterior sub-Tenon's capsule once phacoemulsification (PE) is complete is an excellent substitute for steroid eye drops in reducing inflammatory symptoms after surgery. Furthermore, TA intracameral injections had anti-inflammatory effects comparable to prednisolone eye drops after cataract surgery^{4,5} Similar to dexamethasone eye drops, a seven-day dexamethasone implant was shown by Wadwood and colleagues; it reduces inflammation following PE. The optimal method of treating uveitic eyes involves injecting TA intravitreal or intracameral after PE, in addition to the standard postoperative corticosteroid eye drops⁶ To relieve inflammation in the anterior region, eyes that had previously had intraocular inflammation were significantly helped the first day following cataract surgery by administering betamethasone subconjunctivally. According to recent studies, 34% of patients report eye pain in the first three days after cataract surgery,

and 10% report pain even in the sixth week after surgery⁷ Inflammation could impede healing and make patients miserable by causing dryness, discomfort, and pain in the eyes following surgery⁸ Therefore, lowering inflammation should be the primary goal of postoperative treatment. The efficacy of corticosteroids in treating inflammatory ocular disease was recognised as early as 1950. Reduce inflammation in the anterior chamber and accompanying problems more effectively with NSAIDs and topical corticosteroids than with placebo, according to numerous studies. As the most recommended course of medication for patients after cataract surgery, 97% of surgeons polled by the Association of Veterans Affairs Ophthalmologists in 2012 recommended corticosteroid or nonsteroidal anti-inflammatory drug (NSAID) drops^{7,8}. Presently, the gold standard of treatment involves these patients using postoperative eye drops, which is a huge hassle for them. Patients over the age of 65 undergoing cataract surgery are at increased risk of not following their treatment regimen as directed. Research monitoring patients' compliance with post-glaucoma surgery topical therapy regimens found that over 30% of patients did not comply to the suggested procedure. Cataract surgery patients may have a higher risk of pharmaceutical wastage and early therapy termination compared to those undergoing other types of ocular surgeries, according to some research⁹ It is, therefore, critically important to discover less complicated methods of administering safe and effective medications following surgery. Presently, the gold standard of treatment involves these patients using postoperative eye drops, which is a huge hassle for them. Patients over the age of 65 undergoing cataract surgery are at increased risk of not following their treatment regimen as directed. Research monitoring patients' compliance with post-glaucoma surgery topical therapy regimens found that over 30% of patients did not comply to the suggested procedure¹⁰ When treating inflammatory eye diseases, Graham and Peyman 1974 looked on the safety of intraocular dexamethasone (DXM). Unfortunately, there have been very few studies examining the effectiveness of intracameral DXM in decreasing inflammation following cataract surgery in the past 20 years.^{11,12} This study tried injecting dexamethasone subconjunctivally and intracamerally into children who had cataract surgery to see if it would help reduce inflammation after the procedure.

Received on 03-06-2023

Accepted on 22-08-2023

MATERIALS AND METHODS

In this comparative observational study 160 patient were included and this study was conducted at Department of Ophthalmology PAQSJ institute of medical sciences and Gambat medical college Gambat during January 2022 to May 2023. This study incorporated 160 male and female patients receiving cataract surgery, with the youngest patient's age being 14 years. Following the acquisition of signed informed consent from patients' parents or guardians, comprehensive demographic information, including sex and age, was recorded. Each patient was randomly assigned to one of two groups; 80 patients in group I got 2 mg of subconjunctival dexamethasone injected, and 80 patients in group II got 0.4 mg of intracameral dexamethasone injected. Using a slit light, postoperative inflammation was assessed on the first and third postoperative days. The inspection was conducted under sedation or general anaesthesia using a microscope in cases where the youngster was not cooperative. The incidence of inflammation following surgery was compared between the two groups. We used SPSS 24 to analyse all of the data. The inflammatory response after surgery was compared between groups I and II using a chi-square test. A p-value less than 0.05 was deemed significant.

RESULTS

There were majority males 92 (57.5%) and 68 (42.5%) females among all cases. 40 (25%) cases had age <6 years, 85 (53.1%) cases had age 6-10 years and 35 (21.9%) cases had age 11-14 years.(table 1)

Table-1: Demographics of the presented cases

Variables	Frequency	Percentage
Gender		
Male	92	57.5
Female	68	42.5
Age		
<6years	40	25
6-10 years	85	53.1
11-14 years	35	21.9

A significant difference was identified between the two groups, with a p-value of less than 0.005. In group I, postoperative inflammation was found in 25 patients, which accounts for 31.3% of the total, while in group II, it was found in 5 patients, which accounts for 3.8% of the total.(figure 1)

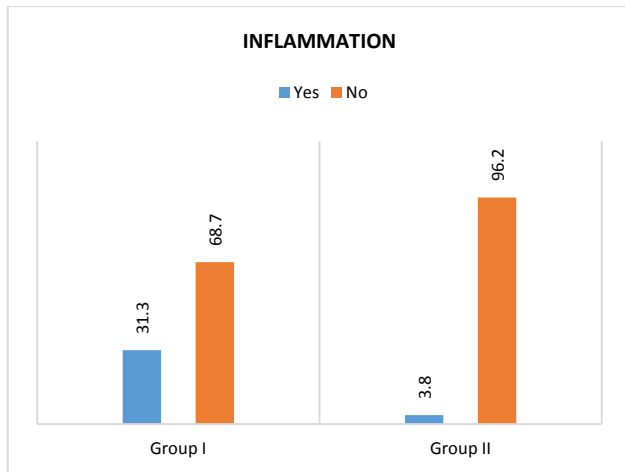


Figure-1: Post-operative comparison of inflammation among both groups

DISCUSSION

Surgery to correct congenital cataracts is associated with an increased risk of postoperative inflammation. For patients undergoing cataract surgery, injecting dexamethasone is a well-known and successful way to avoid posterior synechiae, often

known as postoperative inflammation. Many investigations and therapy approaches have focused on this strategy^{13,14}. In order to reduce inflammation following cataract surgery, this research aimed to examine intracameral dexamethasone injection vs subconjunctival injection. Postoperative inflammation was considerably more common in patients who had subconjunctival injections of dexamethasone (31.3% vs. 3.8% for intracameral injections). The statistical significance of this difference was established (p <0.005). One safer and more effective technique to avoid inflammation after cataract surgery was to inject dexamethasone into the eye's intracameral canal, according to a study conducted in Pakistan by Afia et al.¹⁵. Inflammation following surgery was more common in the intracameral canal group (4.21% vs. 15.79%), according to the study. In their study on postoperative inflammation prevention during phacoemulsification, Gungor et al.¹⁶ discovered that intracameral triamcinolone acetonide and intracameral dexamethasone were equally efficient in suppressing inflammation. Zerener et al. found no difference between dexamethasone and TA in reducing postoperative oedema, pain, and trismus in individuals undergoing cataract surgery¹⁷. Lindholm et al. discovered no statistically significant differences between TA and dexamethasone when it comes to visual acuity and intraocular pressure (IOP) on the last day of follow-up.¹⁸ In Gungor et al. found no statistically significant differences between the dexamethasone and TA groups with respect to visual acuity, anterior cell count, or flare¹⁹. The small doses of dexamethasone and TA used in the studies that included them, along with the exclusion of patients with glaucoma in their family or an early response to systemic or local corticosteroids for ocular hypertension, are likely to blame for the lack of statistical significance. The majority of the research only tracked individuals for a maximum of 28 days, which could be a contributing factor. Although both the TA and dexamethasone groups reached an aqueous flare peak at 7 days, the TA group returned to baseline levels by 90 days, while the dexamethasone group stayed elevated, indicating that the anti-inflammatory effects of TA are more long-lasting, according to Lindholm et al.^[18] Depending on the location of the disease, different drug delivery routes have been utilised to manage eye disorders. Utilising pharmaceutical formulations with an extended pre-corneal retention or medicines with a high corneal permeability can enhance the bioavailability of the ocular surface and anterior segment. It is recommended to deliver the treatment locally in order to minimise systemic side effects to eye problems affecting the front of the eye^{20,21}. Previous studies have demonstrated that injecting TA directly into the anterior chamber is a safe and effective method for reducing inflammation after cataract surgery^{22,23}. Because injecting TA into the eye is not one of the listed uses, additional caution is required.

CONCLUSION

It was determined that intracameral injection of dexamethasone is far more successful than sub-conjunctival injection for preventing inflammation after cataract surgery in youngsters.

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This article may be cited as: Shah SSA, Khan SS, Naeem M, Chauhdary AMM, Awan LCAH, Iqbal MZ: Evaluate the Efficacy of Intracameral and Sub-Conjunctival Dexamethasone in Preventing Postoperative Inflammation in Patients Undergoing Cataract Surgery. *Pak J Med Health Sci*, 2023;18(9): 79-81.