

# The Comparison of Efficacy between Intracameral and Sub-conjunctival Dexamethasone for the Prevention of Postoperative Inflammation in Paediatric Patients with Cataract Surgery

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## ABSTRACT

**Objective:** The main purpose of this study is to evaluate the efficacy of intracameral and subconjunctival injections of dexamethasone in the prevention of postoperative inflammation in patients who are having cataract surgery.

**Study Design:** Observational/comparative study

**Place and Duration:** Conducted at Jinah International Hospital, Abbottabad, from February 2021 to August 2021.

**Methods:** Total 90 patients of both sexes with ages 3-15 years were presented in this study. All the included patients underwent cataract surgery. After obtaining the permission from parents, we collected demographic data on all of the enrolled children, including their age, gender, and place of residence. 45 patients received intracameral in group A and sub-conjunctival dexamethasone provided to 45 patients of group B. Post-operatively slit lamp biomicroscopy was done to assess inflammation after 1<sup>st</sup> and 3<sup>rd</sup> day between both groups. SPSS 22.0 was used to analyze all data.

**Results:** Among 90 patients, majority of the cases were males 57 (63.3%) and rest were females 33 (36.7%). The mean age of the patients in group A was 9.6±14.76 years and in group B mean age was 8.6± 8.52 years. 25 (55.6%) patients in group A and 22 (48.9%) cases of group B had urban residency. Post-operative, we found higher frequency of inflammation in group B in 12 (26.7%) as compared to group A in 3 (6.7%) cases with p value <0.05.

**Conclusion:** In children having cataract surgery, we came to the conclusion that an intracameral injection of dexamethasone is more successful than a sub-conjunctival injection of dexamethasone at preventing postoperative inflammation.

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

## INTRODUCTION

Cataracts are the most common cause of curable blindness in the world. As much as 51.5 percent of the country's total blindness is caused by cataracts [1]. In the globe, around 65 percent of patients with cataract-induced vision loss are over 50. Age-related cataracts may cause a severe loss of vision in more than half of adults over the age of 65 [2]. Cataracts are predicted to rise in number as the population ages, as well as the average lifespan. Among people in both developed and developing nations, cataracts are the most common cause of visual loss [3]. Ophthalmologists throughout the globe do the most cataract surgeries. Estimates suggest that the number of global cataract procedures is anticipated to rise as the population and longevity increase [4]. Small-incision cataract surgery by phacoemulsification has become the most common contemporary procedure and the gold standard in cataract surgery [5]. In spite of advances in surgical procedures and intraocular lenses, postoperative inflammation is one of the most prevalent problems after surgery. Because of surgical stress, proteins and inflammatory cells flow into the anterior chamber, damaging the blood-aqueous barrier. Inflammation after surgery may lead to increased intraocular pressure (IOP), synechia development, and cystoid macular edema [6].

Using corticosteroids after phacoemulsification surgery has a variety of uses and benefits. Some surgeons use such injections to reduce inflammation for the first 24 hours, while other surgeons use nothing but topical steroids for the first several days of treatment. [7] Steroid injections into the sub-conjunctival space are still one of the most common treatments for preventing postoperative inflammation, although they may be uncomfortable in instances when topical anaesthetic is used and can result in sub-conjunctival bleeding and chemosis. Previously, this approach was used to control inflammation at our clinic. The anterior vitrectomy aided by triamcinolone acetonide (TA) has been reported as an efficient way for seeing and removing the vitreous in difficult procedures and situations where the vitreous has been

removed. [8,9] Further research revealed that intracameral TA injections given during and immediately after surgery helped to reduce corneal inflammation and edema on the first postoperative day. After reading articles [10,11] on the safety and efficacy of intracameral injection of 2 mg/0.05 ml TA, we decided to change this approach as of today. Because of its particle shape and its potential to raise IOP in certain patients, we had to switch to intracameral 0.4 mg/0.1 ml dexamethasone in our clinic.

Visually significant cataracts are treated surgically, which is a very cost-effective operation with a great prognosis for vision restoration. An amblyopic infant will have a poor visual result without prompt treatment for their congenital cataract [12]. Congenital cataract surgery may produce in problems such as posterior capsule opacification, glaucoma, and retinal detachment. An inflammation-related consequence is the most prevalent postoperative complication in congenital cataract surgery [13]. Inflammation may cause issues such as peripheral anterior and posterior synechia, exudative membrane and pupil-block glaucoma, which hinder successful visual rehabilitation. The study's goal was to identify a medication that would lessen post-operative inflammation and lower the likelihood of adverse outcomes. Various methods such as sub-conjunctival injection during surgery, collagen shield, intracameral injection, sustained release intraocular drug delivery system [14,15] and intensive traditional topical steroid therapy are the most reliable ways to manage inflammation. Inflammation may be treated in a number of ways, each with varying degrees of effectiveness and safety.

Dexamethasone intracameral injection and dexamethasone sub-conjunctival injection were scheduled to be compared for their ability to prevent early postoperative inflammation following congenital cataract excision.

## MATERIAL AND METHODS

This Observational/comparative study was conducted at Jinah International Hospital, Abbottabad, from February 2021 to August 2021 and comprised of 90 patients. After obtaining the permission

from parents of the patients, we collected demographic data on all of the enrolled children, including their age, gender, and place of residence. Patients >15 years of age and those did not provide any written agreement were not included in this study.

Patients of both sexes with ages 3-15 years were presented in this study. All the included patients underwent cataract surgery. Cataracts of more than 3 millimetres in diameter were considered to be visually significant when the Snellen's visual acuity of the verbal kid was less than 6/6 and the cataract size was more than 3 millimetres. Cases with no underlying anterior or posterior segment disease were chosen for this study. Prior ocular surgery patients as well as secondary cataract patients, were excluded from the research. Lens aspiration, surgical capsulotomy and anterior vitrectomy were performed on all of the youngsters. Patients were equally divided in two groups. 45 patients received intracameral dexamethasone 0.4mg in group A and sub-conjunctival dexamethasone 2mg was injected to 45 patients of group B. Post-operative slit lamp biomicroscopy was done to examine inflammation after 1<sup>st</sup> and 3<sup>rd</sup> day among both groups. SPSS 22.0 was used to analyze all data.

**RESULTS**

Among 90 patients, majority of the cases were males 57 (63.3%) and rest were females 33 (36.7%).(fig 1)

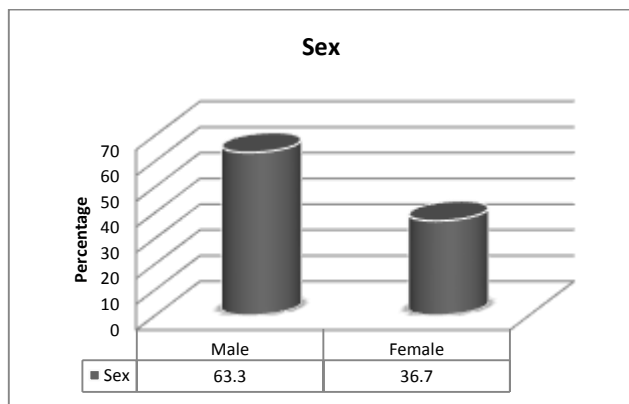


Figure-1: Included patients and gender distribution

Table-2: Detailed demographics of all patients

Variables	Group A	Group B
Mean age (years)	9.6±14.76	8.6± 8.52
Place of Living		
Urban	25 (55.6%)	22 (48.9%)
Rural	20 (44.4%)	23 (51.1%)

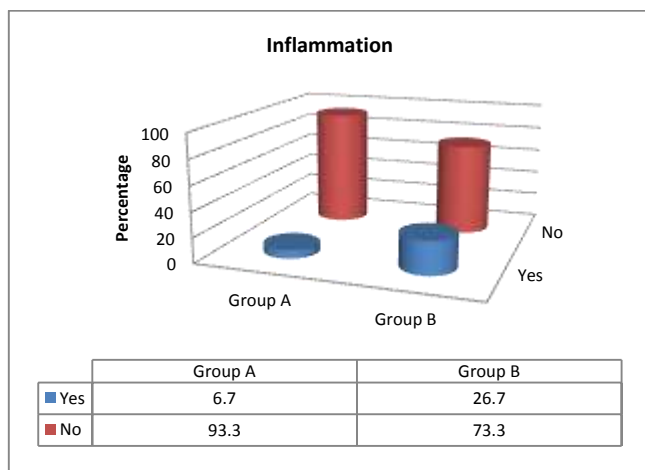


Figure-2: Post-operatively comparison of inflammation

The mean age of the patients in group A was 9.6±14.76 years and in group B mean age was 8.6± 8.52 years. 25 (55.6%) patients in group A and 22 (48.9%) cases of group B had urban residency.(table 2)

Post-operative, we found higher frequency of inflammation in group B in 12 (26.7%) as compared to group A in 3 (6.7%) cases with p value <0.05.(fig 2)

**DISCUSSION**

It has so been a major emphasis in current cataract surgery[16] to manage inflammation. The significant anti-inflammatory effects of steroids work on a variety of inflammatory mediators inside cells. [17] Ophthalmologists have employed steroids since the 1950s to minimize postoperative intraocular inflammation by regulating cell leakage and reducing proliferation of fibroblasts and granulation tissue formation[17]. Systemic steroids in the form of oral medicine, intramuscular injections, or intravenous injections may be used in a variety of eye conditions. Dexamethasone injection has been widely utilized to minimize postoperative inflammation in cataract surgery patients over the last two decades[18,19]. For the prevention of postoperative inflammation, this research compared the efficacy and safety of sub-conjunctival and intracameral dexamethasone injections.

In this study 90 children of both genders were presented. Among 90 patients, majority of the cases were males 57 (63.3%) and rest were females 33 (36.7%). The mean age of the patients in group A was 9.6±14.76 years and in group B mean age was 8.6± 8.52 years. 25 (55.6%) patients in group A and 22 (48.9%) cases of group B had urban residency. These results were comparable to the previous researches.[20,21] Study participants who received dexamethasone by sub-conjunctival injection were more likely to have postoperative inflammation (26.7%) than those who got intracameral injections (6.7%) and their differences were statistically significant (pvalue:0.05). Researchers in Pakistan found that intracameral dexamethasone injection was more effective and safe in preventing postoperative inflammation in cataract surgery patients than subconjunctival dexamethasone injection[20]. The researchers found that the intracameral group had a postoperative inflammation frequency of 4.21 percent while the subconjunctival group had a frequency of 15.79 percent. There is another research by Gungor et al [22] comparing intracameral dexamethasone with intracameral triamcinolone acetonide for the prevention of postoperative inflammation, and they found that both were equally efficient in managing postoperative inflammation after phacoemulsification.

Intracameral dexamethasone is safe for ocular endothelial cells, according to a recent research.[23] The average inflammatory score was considerably lower in the Dexamethasone group compared to the Indomethacin and Ciprofloxacin groups in the research by Zhang et al. Dexamethasone also resulted in lower intraocular pressure when compared to other research interventions[24].

**CONCLUSION**

In children having cataract surgery, we came to the conclusion that an intracameral injection of dexamethasone is more effective than a sub-conjunctival injection of dexamethasone in preventing postoperative inflammation.

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