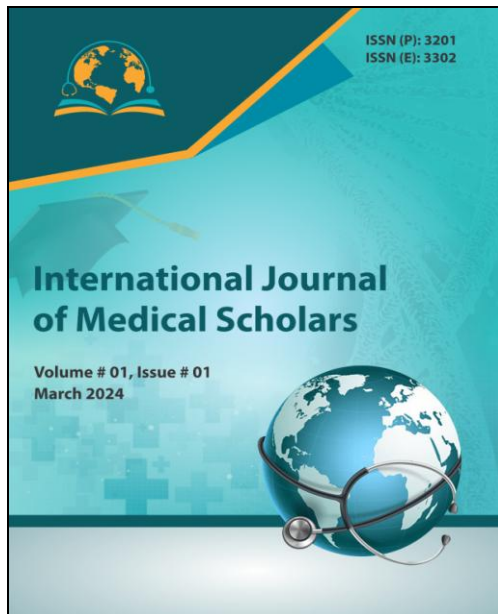


International Journal of Medical  
Scholars  
Article DOI:  
Volume 1, Issue 1, March 2023



**Comparing the Anti-inflammatory Effect  
between Topical Dexamethasone versus  
Intracameral Triamcinolone Acetonide  
after Phacoemulsification**

**Publication History**

Received: Jan 20, 2023      Revised: Jan 29, 2023  
Accepted: Feb 15, 2023     Published: Mar 30, 2023

**Authors**

Minahil Afzal<sup>1\*</sup>, Minahil Naul<sup>2</sup>, Zainab Hussain<sup>3</sup>,  
Muhammad Sher Zaman<sup>4</sup>  
<sup>1,2,3</sup> Shalamar Hospital Lahore, Pakistan  
<sup>4</sup>Government University Hospital Faisalabad, Pakistan  
\*Corresponding Author Email: sherzaman13@gmail.com

**Copyright & Licensing:**



Authors retain copyright and grant the journal right of first publication with the work simultaneously licensed under a [Creative Commons Attribution \(CC-BY\) 4.0 License](https://creativecommons.org/licenses/by/4.0/) that allows others to share the work with an acknowledgment of the work's authorship and initial publication in this journal.

**Conflict of Interest:**

Author(s) declared no conflict of interest.

**Acknowledgment:**

No Funding received.

**Citation:** Afzal M, Naul M, Hussain Z, Zaman MS. Comparing the Anti-inflammatory Effect between Topical Dexamethasone versus Intracameral Triamcinolone Acetonide after Phacoemulsification. International Journal of Medical Scholars. 2023 March 30; 1(1):12-17.

Please scan me to access online.



An official publication of  
**Medteach Private Limited, Multan, Pakistan.**  
Email: info@medteach.org, Website: <https://www.medteach.org/index.php/ijms>





## Comparing the Anti-inflammatory Effect between Topical Dexamethasone versus Intracameral Triamcinolone Acetonide after Phacoemulsification

Minahil Afzal<sup>1\*</sup>, Minahil Naul<sup>2</sup>, Zainab Hussain<sup>3</sup>, Muhammad Sher Zaman<sup>4</sup>

<sup>1,2,3</sup>Shalamar Hospital Lahore, Pakistan

<sup>4</sup>Government University Hospital Faisalabad, Pakistan

\*Corresponding Author Email: sherzaman13@gmail.com

### ABSTRACT

**Objective:** is to compare the effectiveness of intracameral triamcinolone acetonide injection and topical dexamethasone in the prevention of postoperative inflammation after phacoemulsification.

**Methods:** Total number of patients (80) were assigned in two group on basis of their treatment plan either topical dexamethasone or triamcinolone intracameral. Main variables of study were postoperative outcomes (cells or flare) and intraocular pressure at day 1, 7 and 28.

**Results:** Postoperative outcomes of Group A and Group B with respect to cells and flare were almost equal, ( $p > 0.050$ ). Further, the mean intraocular pressure at preoperative, day one, day seven and twenty-eight day in both the groups were almost equally distributed, and the differences were statistically insignificant, ( $p > 0.050$ ).

**Conclusion:** There was difference between intracameral injection of triamcinolone acetonide and topical dexamethasone in terms of postoperative inflammation and intraocular pressure after cataract surgery with phacoemulsification technique.

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

## 1. INTRODUCTION

Clouding of eye lens named as cataract, which affects vision and is the main reason treatable blindness around the world. In Pakistan, it is estimated that 51.5% of all cases of blindness are due to cataracts<sup>1</sup>. Globally, approximately 65% of all people with visual impairment due to cataracts are 50 years of age or older<sup>2</sup>. In addition to surgical treatment, there are also life style changes that can be made to help prevent and reduce the risk of cataracts. These include wearing sunglasses with UV protection, quitting smoking, eating a healthy diet, and reducing exposure to sunlight and other sources of UV radiation<sup>3</sup>.

Phacoemulsification is able to reduce the amount of time it takes to complete the surgery, which is beneficial for both the patient and the clinician. Additionally, the technique uses less energy, is cost-effective, and offers better long-term outcomes<sup>4</sup>. Postoperative inflammation can lead to a variety of complications that can potentially cause serious damage to the eye. Raised intraocular pressure (IOP) is one of the more serious complications that can result from postoperative inflammation<sup>5</sup>. Cystoid macular edema (CME) is another possible complication of postoperative inflammation, where fluid accumulates inside the macula, leading to blurred vision. Postoperative inflammation can also result in increased recovery time and synechiae formation, which is the formation of adhesions in the anterior chamber of the eye that can cause glaucoma or cataract<sup>6</sup>.

Postoperative inflammation is a common complication of cataract surgery, and topical steroids are an effective form of treatment<sup>7</sup>. However, in some cases, other forms of administration are necessary. Intravitreal, intracameral, subtenon, and subconjunctival routes of steroid

administration can be used, with Triamcinolone providing the best results when given through the intracameral route<sup>8</sup>. Studies have shown that this steroid has a 100% efficacy rate after surgery<sup>9</sup>. Additional measures such as antifungal, antiviral, and/or antibacterial treatments may also be recommended, depending on the type and severity of the inflammation. In general, careful monitoring and periodic follow-ups with the ophthalmologist are advised to ensure the best possible outcome<sup>10</sup>.

## 2. METHODOLOGY

Trial was conducted in the Department of Ophthalmology at the Department of Ophthalmology and Shalamar Hospital, Lahore. In this study corneal endothelial cell density, graft survival rate and intraoperative complications of phacoemulsification with corneal endothelial cell transplantation (CEC) and without CEC were studied. The study, which obtained approval from the hospital's ethics committee, enrolled a total of 80 patients aged between 40 to 70 years. Inclusion criteria encompassed individuals of any gender undergoing phacoemulsification for cataract in the Department of Ophthalmology. Exclusion criteria involved patients with anterior uveitis, ocular pathology, a history of prior surgery, intraoperative complications, and other comorbid conditions.

The procedure, conducted under local anesthesia, was performed by a qualified consultant surgeon with a minimum of five years of experience. In Group A, triamcinolone acetonide 1 mg was given intracameral. In group B dexamethasone 0.1% eye drops were given, with a dosage of one drop every four hours for four weeks. Despite undergoing identical phacoemulsification procedures, the distinguishing factor between the groups

was the type of postoperative treatment administered.

A moxifloxacin eye drop solution was advised to all patients after surgery. The drops were administered every six hours at a dosage of 0.5% and treatment was continued for four weeks. Follow-up visits were scheduled over the course of the treatment period at day 1, 7 and 28 in order to assess the degree of inflammation, which was quantified by counting the number of cells in the anterior chamber and evaluating the aqueous flare. The cell count was graded according to the criteria of 0=50 or fewer cells. Aqueous flare was graded based on the following criteria: 0=none, 1=just detectable or mild, 2=iris details clear or moderate, 3=iris details hazy or marked flare, and 4=severe flare or heavy clots and fibrin deposits. These follow-up visits helped to monitor the efficacy of moxifloxacin eye drops in alleviating inflammation.

IBM SPSS Statistics for Windows, Version 23.0 was used to perform the statistical analysis of the research with 0.05 probability value.

### 3. RESULTS

Overall, 80 patients were included in our study. The study patients were equally divided into two equal groups as Group A 40 (50.0%) and Group B 40 (50.0%). The mean age of Group A and Group B was 48.61±6.02 years and 49.32±4.82 years, respectively. There were 25 (62.5%) males and 15 (37.5%) females, in Group A. whereas, there were 30 (75.0%) males and 10 (25.0%) females in Group B. age and sex distribution were almost equal in both the groups, (p>0.050). (Table. I).

Postoperative outcomes of Group A and Group B with respect to cells and flare were almost equal (p>0.050). (Table. II). Further, the mean intraocular pressure at

preoperative, day one, day seven and twenty-eight day in both the groups were almost equally distributed, and the differences were statistically insignificant, (p>0.050). (Table. III).

**Table-I: Demographic characteristics of both the groups**

Characteristic	Group A n=40	Group B n=40	p-value
Age (years)	48.61±6.02	49.32±4.82	0.554
Sex			
Male	25 (62.5)	30 (75.0)	0.228
Female	15 (37.5)	10 (25.0)	

**Table-II: Postoperative characteristics of both the groups**

Outcome	Period	Group A n=40	Group B n=40	p-value
Cells	1 <sup>st</sup> day	1.81±0.46	1.78±0.41	0.819
	7 <sup>th</sup> day	0.31±0.17	0.30±0.19	0.925
	28 <sup>th</sup> day	0.14±0.10	0.12±0.07	0.334
Flare	1 <sup>st</sup> day	0.26±0.19	0.34±0.23	0.091
	7 <sup>th</sup> day	0.22±0.12	0.21±0.11	0.799
	28 <sup>th</sup> day	0.08±0.05	0.07±0.04	0.952

**Table-III: The average intraocular pressure comparison of both the groups**

Period	Group A n=40	Group B n=40	p-value
Pre-operative	18.24±2.35	18.66±2.16	0.412
1 <sup>st</sup> day	17.61±3.01	17.35±3.38	0.720
7 <sup>th</sup> day	14.39±2.43	14.77±1.76	0.429
28 <sup>th</sup> day	12.61±1.81	12.58±1.89	0.962

### 4. DISCUSSION

The use of steroids in treating postoperative inflammation is generally safe and effective, as long as patients follow their doctor's advice and use the recommended dose<sup>11</sup>. Additionally, steroid injections have the benefit of being relatively quick and easy to administer, and can provide immediate relief from inflammation<sup>12</sup>.

However, there is still some uncertainty about the exact mechanism by which steroids reduce inflammation, and further research is needed to fully understand the effects of this type of treatment. In addition, due to their potential side effects, steroids should only be used sparingly and under the supervision of a qualified ophthalmologist<sup>13</sup>.

A study by Oh et al<sup>14</sup> (2016) investigated the use of triamcinolone acetonide as an intraocular injection in rabbit eyes, to assess the effects on the corneal endothelium. The study found that microvilli in the anterior chamber of the rabbit eyes decreased 2 hours after injection, however there was no statistically significant difference in the endothelial cell counts or central corneal thickness. Several studies have found toxic effects of triamcinolone acetonide on cultured corneal endothelium. Chang et al<sup>15</sup> for example, demonstrated that triamcinolone acetonide had a negative effect on the cell viability of cultured endothelium. Despite these findings, it is still commonly used to control postoperative inflammation after cataract surgery.

Gills JP et al<sup>16</sup> demonstrated the efficacy of an intracameral steroid injection as a replacement for postoperative steroid drops. The study showed that the high-concentration steroid injection resulted in better outcomes in terms of pain, inflammation, and reduced vision-threatening complications compared to postoperative use of steroid drops. The study highlighted the importance of sufficient concentrations of intracameral steroid injection to achieve better and more sustained outcomes after cataract surgery. Karalezli et al<sup>17</sup> conducted a study in which they investigated the efficacy of intracameral triamcinolone acetonide injection for the suppression of postoperative inflammation after cataract

surgery. The authors concluded that intracameral triamcinolone acetonide injection is a safe and effective intervention for the suppression of post-operative inflammation after cataract surgery.

In a study by Manzoor A<sup>18</sup> reported that Intracameral injection of triamcinolone acetonide is an effective way to reduce post-operative inflammation following phacoemulsification without the need for topical steroids. Recent research has suggested that the single dose of triamcinolone acetonide injected directly into the anterior chamber of the eye has similar efficacy to topical dexamethasone in reducing post-operative inflammation.

In an another study Dada et al<sup>19</sup> concluded that single injection of triamcinolone during phacoemulsification is more effective and safe in reduction of postoperative inflammation as compare to administration of postoperative steroid. In a study Elkhodary et al<sup>20</sup> studied anti-inflammatory effect intracameral triamcinolone acetonide and steroid injection and concluded that intracameral injection is a safe alternative of dexamethasone.

Limitations: There is currently no consensus on the optimal route of administration for corticosteroids after cataract surgery. The choice between topical and intracameral administration remains a subject of debate in the ophthalmic community.

Recommendations: Comparative studies are needed to provide evidence-based recommendations for the most effective anti-inflammatory approach.

## 5. CONCLUSION

Our results reveal that there was difference between intracameral injection of triamcinolone acetonide and topical dexamethasone in terms of postoperative

inflammation and intraocular pressure after cataract surgery with phacoemulsification technique.

## REFERENCES

1. Elgazzar AF. Anti-inflammatory Effects of Intracameral Triamcinolone Acetonide Injection versus Topical Dexamethasone after Cataract Surgery: A Prospective Comparative Study Akram Fekry Elgazzar and Riad Elzaher Hassan Ahmed. *Global J Curr Res Vol.* 2019;6(4):149-53.
2. El-Haddad NS. A Single Dose Intracameral Triamcinolone Injection Following Phacoemulsification. *The Egypt J Hospital Med.* 2021;84(1):2667-70.
3. Murthy GVS, John N, ShamannaBR, Pant HB. Elimination of avoidable blindness due to cataract: Where do we prioritize and how should we monitor this decade? *Ind J Ophthol.* 2012; 60: 438-445.
4. Choopong P, Taetrongchit N, Boonsoon S, Nimkarn A, Srisukkosalin K, Chonpimai P et al. Efficacy of subtenon 20-mg triamcinolone injection versus 0.1% dexamethasone eye drops for controlling inflammation after phacoemulsification: a randomized controlled trial. *Sci Reports.* 2022;12(1):16471.
5. Khairallah M, Kahloun R, Bourne R, et al. Number of people blind or visually impaired by cataract worldwide and in world regions, 1990 to 2010. *Invest Ophthalmol Vis Sci.* 2015 Oct; 56 (11): 6762-9.
6. Khan MA, Ahmad F, Ahsen M, Anwar F, Shahzad MA, Bhatti SA. Examine the Comparison of Efficacy Between Intracameral and Sub Conjunctival Dexamethasone for the Prevention of Postoperative Inflammation in Patients with Cataract Surgery. *Pak J Med Health Sci.* 2022;16(05):1435-.1440.
7. Dayal SM, Rehman M, Abbas I. Effectiveness of intracameral and subconjunctival dexamethasone for prevention of postoperative inflammation in cataract surgery. *Pak J Med Health Sci.* 2021;15(3):583-5.
8. Waseem AM. Intracameral Versus Sub-conjunctival Dexamethasone Injection for Postoperative Inflammation in Congenital Cataract Surgery. *Pak J Ophthalmol.* 2019 Jul 1;35(3):123-34.
9. Grzybowski A, Sidaraite A, Zemaitiene R. Management of inflammation after the cataract surgery. *Current Opinion in Ophthalmology.* 2023;34(1):9-20.
10. Jamil AZ, Ahmed A, Mirza KA. Effect of intracameral use of Dexamethasone on corneal endothelial cells. *Coll Phys Surg Pak.* 2014; 24: 245-248.
11. Chen P, Han X, Zhu Y, Xu J. Comparison of antiinflammatory effects of flourometholone 0.1% combined with levofloxacin 0.5% and tobramycin/dexamethasone eye drops after cataract surgery. *Int J Ophthalmol.* 2016; 9 (11): 1619–1623.
12. Ellis PP. Pharmacological effects of corticosteroids. *Int Ophthalmol Clin.* 1996; 6: 799–819.
13. Simaroj P1, Sinsawad P, Lekhanont K. Effects of intracameral triamcinolone and gentamicin injections following cataract surgery. *J Med Assoc Thai.* 2011 Jul; 94: 819-25.

14. Oh JY, Wee WR, Lee JH, Kim MK. Short-term effect of intracameral triamcinolone acetonide on corneal endothelium using the rabbit model. *Eye (Lond)* 2007; 21: 812–8.
15. Chang YS, Tseng SY, Teseng SH, Wu CL, Chen MF. Triamcinolone acetonide suspension toxicity to corneal endothelial cells. *J Cataract Refract Surg.* 2006; 32: 1549– 55.
16. Gills JP, Gills P. Effect of intracameral triamcinolone to control inflammation following cataract surgery. *J Cataract Refract Surg.* 2005; 31: 1670–1.
17. Karalezli A, Borazan M, Akova YA. Intracameral triamcinolone acetonide to control postoperative inflammation following cataract surgery with Phacoemulsification. *Acta Ophthalmol.* 2008; 86: 183–7.
18. Manzoor A, Moin M. Comparison of Anti-inflammatory Effect between Intracameral Triamcinolone Acetonide and Topical Dexamethasone after Phacoemulsification. *Pak J Ophthalmol.* 2018;34(1):19-24.
19. Dada T, Dhawan M, Garg S, Nair S. Safety and efficacy of intraoperative intravitreal injection of triamcinolone acetonide injection after phacoemulsification in cases of uveitic cataract. *J Cataract Refract Surg.* 2007; 33: 1613– 18.
20. Elkhodary NM, Hasan ZS, El-Din Mohamed NS. Comparison of Anti-inflammatory Effect between Intracameral Triamcinolone Acetonide and Topical Dexamethasone after Phacoemulsification. *The Egyptian Journal of Hospital Medicine.* 2023;90(1):601-6.