

COMPARATIVE EVALUATION OF LMW HEPARINIZED INFUSION VERSUS BASALSALT SOLUTION (BSS) IN CONJENITAL, COMPLICATED AND TRAUMATIC CATARACT SURGERYHarpal Singh¹, V. K. Saini²**HOW TO CITE THIS ARTICLE:**

Harpal Singh, V. K. Saini. "Comparative Evaluation of LMW Heparinized Infusion versus Basalsalt Solution (BSS) in Conjenital, Complicated and Traumatic Cataract Surgery". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 26, March 30; Page: 4438-4441, DOI: 10.14260/jemds/2015/641

ABSTRACT: PURPOSE: To evaluate the role of LMW heparinised infusion in reducing post-operative inflammation of eyes at risk. **DESIGN:** Randomized prospective double-blind study. **METHODS:** Total 80 patients who underwent cataract surgery with heparinised infusion and BSS infusion were divided into two groups. Group-I-(40 patients) who underwent cataract surgery under heparinised infusion. Group-II-(40 patients) who underwent cataract surgery under BSS Infusion. Heparinised infusion at the concentration of 5IU/ML was used and it was prepared by adding 2500 IU of heparin to 500ml of balanced salt solution (BSS). Cases with preoperative complications were not included in the study. Early and late postoperative inflammatory complications, including fibrin formation, anterior and posterior synechia, cyclitic and pupillary membrane formation were recorded and compared. **RESULTS:** There were significant difference in post-operative anterior chamber reaction on day-1 in Heparin infusion, compare to BSS infusion. On day-4 no patient in the heparin infusion group had an anterior chamber reaction greater than grade-I compare to BSS Infusion group. **CONCLUSION:** Anterior chamber irrigation with heparin during surgery may minimize early inflammatory reaction and decrease the number of postoperative inflammation related complications.

KEYWORDS: pediatric, cataract, surgery, inflammation.

INTRODUCTION: Pediatric cataract surgery and high risk cataract surgery may result in preoperative and postoperative complications.¹ Cataract surgery and other intraocular procedures have a higher incidence and more pronounced postoperative inflammatory reactions in children compared with adults.¹ These reactions are associated with younger age and may be affected by surgical technique, intraoperative injury to adjacent structures such as iris, presence of antecedent ocular infection, and remnants of retained cortical material.¹ Heparin has anti-inflammatory and anti-proliferative effects in addition to its anticoagulant function,² inhibits fibrin formation after intraocular surgery, and has also been shown to inhibit fibroblast activity In this prospective study, we evaluated the influence of anterior chamber irrigation with heparin sodium on early postoperative inflammation and cellular reaction after high risk cataract surgery cataract surgery.

AIMS AND OBJECTIVE: To evaluate the role of LMW heparinised infusion in reducing post-operative inflammation of eyes at risk.

MATERIAL AND METHOD: Total 80 patients who underwent cataract surgery with heparinised infusion and BSS infusion were divided into two groups.

Group-I-(40 patients) who underwent cataract surgery under heparinised infusion.

Group-II-(40 patients) who underwent cataract surgery under BSS Infusion.

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INCLUSION CRITERIA:

- i. Traumatic cataract.
- ii. Complicated cataract.
- iii. Pediatric cataract.

The distribution of patients with three types of cataract as shown in Table.

Types of patients	Heparinised infusion	BSS infusion
Traumatic cataract	19	19
Pediatric cataract	08	08
Complicated cataract	13	13

Heparinised infusion at the concentration of 5IU/ML was used and it was prepared by adding 2500 IU of heparin to 500ml of balanced salt solution (BSS).

Preoperative patients work up was done:

- Visual acuity assessment, slit lamp biomicroscopy, fundus examination, tonometry, B-Scan etc.
- Routine and special blood investigation was done.

Preoperative topical ofloxacin eye drop were instilled 6 to 8 times prior to surgery in all cases.

Post operatively all patients were put on topical prednisolone and flurbiprofen eye drops and cyclopentolate eye drops for 4 weeks. Patients were admitted to hospital one day prior and remained for at least three days postoperatively.

Post-operative inflammation was assessed on day 1 to 4 by slit lamp examination as:

- i. Aqueous flare and cells using a 1 mm beam (graded as I to IV according to the number of cells and density of flare).
- ii. Exudative membrane in the anterior chamber or on the surface of IOL.
- iii. Precipitates or pigments deposits on the IOL.
- iv. Iridocapsular/ Iridolenticular synechiae.

OBSERVATIONS & RESULTS: There were significant difference in post-operative anterior chamber reaction on day-1 in Heparin infusion, compare to BSS infusion. On day-4 no patient in the heparin infusion group had an anterior chamber reaction greater than grade-I compare to BSS Infusion group.

EXCLUSION CRITERIA: Cases with preoperative complications were not included in the study.

DAY-I:

A/C Reaction	Heparin Infusion	BSS infusion
Grade -I	12(30%)	00
Grade-II	19 (47.5%)	07(17.5%)
Grade-III	06(15%)	15(37.5%)
Grade-IV	03(7.5%)	18(45%)

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DAY-IV:

A/C Reaction	Heparin Infusion	BSS infusion
Grade -I	34(85%)	09(22.5%)
Grade-II	06(15%)	12(30%)
Grade-III	0	13(32.5%)
Grade-IV	0	06(15%)

COMPLICATIONS:

Complication	Heparin Infusion	BSS infusion
Hyphaema	03	0
Exudative membrane	05	11
Hypopyon	01	0

DISCUSSION: The pathogenesis of postoperative fibrinoid inflammation is unknown. Any defect in the blood-aqueous barrier (BAB), possibly due to intraocular inflammation, preoperative high intraocular pressure (IOP), or excessive eye manipulation during surgery may lead to a disturbance in the coagulation and fibrinolytic pathway.³ A tendency towards increased postoperative inflammation in children is well recognized.⁴ Intraocular inflammation manifests itself as increased cells and flare, inflammatory precipitates on the IOL and the endothelium, formation of synechia, and inflammatory cyclitic membranes.¹ The fibrinoid reaction after pediatric cataract surgery is caused by the breakdown of the immature BAB and insufficient trabecular meshwork fibrinolytic activity.⁵ Secondary complications of severe fibrinoid reaction include papillary membrane and opacification of the anterior hyaloid face.⁵ Therefore, measures that may prevent or decrease inflammation in these eyes deserve consideration.⁶ In addition to its well-known anticoagulant activity, heparin has anti-inflammatory and anti-proliferative properties.⁵

Heparin inhibits fibrin formation after intraocular surgery and has also been shown to inhibit fibroblast activity.⁷ Due to its anti-thrombin effect, heparin inhibits fibrin formation by accelerating the control mechanisms for thrombin and activated X-factor.⁸ Previous studies elucidate several mechanisms through which heparin may inhibit inflammation including induction of apoptosis in human peripheral blood neutrophils, inhibition of the complement activation and lymphocyte migration, l- and p-selectin, adhesion-molecule support of the initial attachment of leukocytes to the vessel wall at the inflammation site, neutrophil chemotaxis, and generation of refractive oxygen species by mononuclear and polymorphonuclear leukocytes.^{1,3,5} Another useful adjunct for the prevention of membrane formation over the IOL optic is the use of a heparin-coated IOL. And its additive effect to prevent PCO in children. Our results suggest that adding heparin sodium to the irrigating solution seems to be a safe, effective, and promising method to prevent early postoperative inflammatory reactions in high risk cataract surgery.

CONCLUSION: A significant reduction in the post-operative inflammation was observed using heparinised infusion. The anterior chamber reaction with this intervention was comparable to that with heparin coated IOL.

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The study shows that addition of 5IU/ml of heparin in the BSS infusion is safe, cost effective means of reducing postoperative inflammation in eye at high risk. As many studies were done on paediatric cataract cases due to unpredictable higher rate of post-operative inflammatory reactions with excellent results, however its utility in complicated cataract and traumatic cataract surgery was found to be equally good in reducing post-operative inflammation as in our study.

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