Original Article

Post operative Anterior Chamber Reaction in Adult Cataract Surgery after Adding Heparin in Irrigating Solution

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Purpose: To document the post operative anterior chamber reaction in adult cataract surgery after adding heparin in irrigation solution.

Material and Methods: It was a Quasi Experimental Study in which 193 eyes of patients, with ages 50 years to 75 years, were selected by Convenience (Non Probability) sampling technique for cataract surgery in Redo Eye hospital, Rawalpindi from Feb 2011 to Dec 2011. All the cases under went operation by the single surgeon having expertise in the technique of manual sutureless cataract surgery (MSCS). At the beginning of the surgery, 1 ml of heparin sodium (concentration 10 IU/ml) was added to the balanced salt solution to irrigate the anterior chamber during the surgery. All patients were followed on the first post operative day and after one week. At follow up visits, postoperative intraocular cellular reaction based upon modified Hogan's classification was noted.

Results: On the first post operative day, 5.2% of the cases had mild and 1% cases had moderate anterior chamber reaction. The patient were put on the standard topical treatment and on first week follow up the anterior chamber reaction was absent in all of the cases.

Conclusion: We found that after adding heparin in the irrigating solution there was mild anterior chamber reaction in 5.2% of our cases and it can play a role to reduce the post operative inflammation in adult cataract surgery.

Key Words: Cataract Surgery, Heparin, Anterior Chamber

Among the world's blind population, 4% lives in Pakistan; 80% of which is avoidable.[1] Cataract is one of the leading causes of reversible blindness in the world and cataract surgery consists of major work load of every ophthalmic unit.[2]

Every procedure whether phacoemulsification, extracapsular cataract extraction or manual suture less cataract extraction merits and demerits are being debated by the ophthalmology community but one consensus remains for every procedure that the postoperative inflammation after surgery should be minimal[3]. Anterior chamber inflammation following cataract surgery has been reported up to 30% varying from mild to severe.[4] Post operative anterior chamber reaction is significant as it may lead increased intraocular pressure (IOP), corneal edema, endothelial injury, fibrin formation on intraocular lens (IOL) surface, posterior synechia (PS), posterior capsular opacity (PCO), cystoid macular edema (CME), and chronic anterior uveitis.

Heparin having anti-inflammatory properties is being used in pediatric cataract surgery in the form of coatings on the intraocular lenses [5] and in irrigating solutions to reduce the post operative inflammation[6]. We conducted a quasi experimental study to document the severity of post operative anterior chamber reaction after adding heparin to the irrigating solution during cataract surgery in adults.

MATERIAL AND METHODS

This prospective study was conducted in the Redo Eye hospital, Rawalpindi from Feb 2011 to Dec 2011. Two hundred cases, with ages 50 years to 75 years, were selected by Convenience (Non Probability) sampling technique for cataract surgery. They were allotted a hospital number and had to sign an informed consent for the procedure. Preoperative examinations like slit lamp examination, intraocular pressure measurement by Goldman's applanation tonometry, indirect ophthalmoscopy, A-scan and keratometry were carried out for all cases.

Criteria were patients diagnosed with senile uncomplicated cataract and pupil diameter equal or greater than 7 mm after mydriasis. Exclusion criteria were history of ocular pathology, a relative afferent pupillary defect glaucoma, uveitis, high myopia, pseudoexfoliation, or corneal pathology, traumatic, subluxated and posterior polar cataract, previous ocular surgery, diabetic retinopathy and patients with Fuchs dystrophy and any ocular surface disease. Dark brown cataracts were also excluded because of prolonged surgical time. Cases with intra operative complications like posterior capsular rent were also excluded from the study.

All the cases under went operation by the single surgeon having expertise in the technique of manual sutureless cataract surgery (MSCS).

At the beginning of the surgery, 1 ml of heparin sodium (concentration 10 IU/ml) was added to the 500cc balanced salt solution to irrigate the anterior chamber during the surgery. Procedure was started with a conjunctival flap made at superotemporal part of the limbus. Scleral tunnel was constructed using a crescent knife and extended up to 1.0 mm into clear cornea. A 3.2 mm keratome was used to access the anterior chamber and the internal corneal incision was extended for about 0.5 mm more than the external scleral incision. The anterior chamber was deepened using a standard viscoelastic i.e. 2% hydrooxypropyl methylcellulose and continuous curvilinear capsulorrehexis of 5 - 6 mm was done using a bent 27 – gauge needle mounted on the irrigating infusion. The nucleus was delivered by visco expression and the cortex was washed using a simcoe cannula. A 6.5 mm optic PMMA PC IOL was implanted in the capsular bag inflated by viscoelastic. The viscoelastic material was replaced by BSS solution .The integrity of the self-sealing scleral incision was ensured and the cut conjunctival flap was apposed using a forceps fitted to bipolar diathermy. In the event of any intraoperative complication the surgical technique was modified accordingly and the case was excluded from the study.

Standardized postoperative treatment comprised of prednisolone acetate 1% four hourly and moxifloxacin four times a day for one week. No oral steroids or topical mydriatic treatment was given. All patients were followed on the first post operative day and after one week. At follow up visits, postoperative intraocular cellular reaction based upon modified Hogan's classification[7], was noted i.e. cell counting in the anterior chamber performed by slit-lamp biomicroscopy examination adjusting the lamp as 3 mm height, 1 mm width and x40 magnification defined as in table 1.

RESULTS

This study was completed in Redo Eye hospital, Rawalpindi in a period of 10 months. A total of 193 cases were included in the study consisting of 54.45% females and 45.55% males with age ranging between 50 to 75 years table 2. All patients underwent the same procedure of MSCS.

On the first post operative day, 5.2% patients had mild and 1% cases had moderate anterior chamber reaction (table 3). The patient were put on the standard topical treatment and on first week follow up the anterior chamber reaction was absent in all of the cases.

Table 1: Grading

Severity of Anterior Chamber Reaction	Grade	Cells Per Field
Mild	0	No cells
	±	1 - 5
Moderate	+1	6 - 15
	+2	16 - 25
Severe	+3	26 - 50
	+4	Hypopyon

Table 2: Gender distribution (n = 193)

Gender	No. of Patients	Mean Age
Male	88 (45.55%)	64.2 ± 10.2
Female	105 (54.45%)	62 ± 9.5

Table 3: Anterior chamber reactions on 1st post operative day

	Mild	Moderate	Severe
1st operative day	10 (5.2%)	2 (1%)	0
7th post operative day	Nil	Nil	Nil

DISCUSSION

Age – related cataract is the commonest cause of avoidable blindness all over the world. Cataract surgery forms the major workload of eye units worldwide and is a major health care expense. It is one of the most cost effective of all public health interventions in terms of restored quality of life. Initially cataract surgery was aimed to prevent blindness. Now it has progressed to a refractive procedure that aims for post operative emmetropia. The quality of vision and early visual rehabilitation are the important parameters which determine the success of modern cataract surgery. These two parameters are in turn dependent upon complications associated with the surgical procedure and the post operative inflammation.

Addressing the post operative inflammation is always a challenge for the ophthalmologist. In the era of modern phacoemulsification the post operative inflammation is minimal and it is the procedure of choice in the developed countries. But due to high cost of phacoemulsification;[8] manual sutureless cataract surgery (MSCS) is preferred in the developing countries.[9]

During MSCS the iris manipulation is universal during the some point of surgery[10]. This may lead to higher incidence of postoperative iritis. A series from South India had iritis in 6% and moderate iritis in 3% in the first postoperative week[11]. Similarly a study conducted in Pakistan mentioned patients having mild iritis in 16% and moderate iritis in 5.6% of their cases.[12] We added heparin in the infusion solution and found that there was mild anterior chamber reaction in 5.2% of our cases. This finding is in accordance to other findings of the researchers. Xia et al added heparin for cataract surgery and observed less fibrin and pigment deposits on the lens.[13] Similarly a study conducted in Germany[14] concluded that Heparin – sodium added to the infusion solution during small incision cataract surgery reduced inflammation in the early postoperative period. A comparative study by Kruger et al[15] reported that heparin sodium group had lesser number of inflammatory cells postoperatively. They also reported a complication of hyphema in their study but we did not encounter any such complication in our study.

Heparin an anti coagulant has associated anti inflammatory actions[16]. It inhibits Fibrinous reactions after intraocular surgery by inhibiting fibroblastic activity[17]. These unique properties of heparin lead researchers to use heparin in surface modified IOLs[18] and in pediatric cataract surgery. Similarly Bayramlar and colleagues[19] also concluded that the addition of heparin to the irrigating solution during surgery decreases postoperative fibrinoid reaction and late inflammatory complications. The same was concluded by Ihsan Ç and colleagues[20] in their study.

We are aware of the short comings of the study. The sample size was small and it was not a comparative study but to best of our knowledge we were the first to conduct such a study in Pakistan. Our results may prove a key role in decreasing the post operative inflammation.

CONCLUSION

We found that by adding heparin in the irrigating solution there was mild anterior chamber reaction in 5.2% of our cases and it can reduce the post operative inflammation in adult cataract surgery.

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