

A Study of Role of Anterior Segment Antibiotic wash in Acute Post Operative Cataract Surgery Endophthalmitis

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Abstract: Acute postoperative Endophthalmitis is a dreaded and feared complication of cataract surgery. Though meticulous asepsis has managed to bring down the incidence to a great extent, the occurrence of such cases is of concern. Various methods have been advised to prevent and treat postoperative endophthalmitis. However, no single protocol is suitable for all cases. We hereby propose the use of anterior chamber antibiotic wash for management of these cases.

Keywords: Anterior Chamber Antibiotic Wash, Post Operative Endophthalmitis

I. Introduction

Acute postoperative Endophthalmitis is a rare, dreaded and feared complication of cataract surgery. Though meticulous asepsis has managed to bring down the incidence to a great extent, the occurrence of such cases is of concern. Various studies have reported a potentially higher rate of acute endophthalmitis following cataract surgery in recent years, presumably secondary to the adoption of clear corneal and suture less wounds.^{1,2,3,4} As the condition is rare with an incidence of approximately 1 in 1000 or less, the number is very small to conduct randomized prospective clinical studies. Moreover in the absence of such studies the prophylaxis, prevention and management strategies are based on clinical acumen and post personal experiences of treating such cases. Though there are now set guidelines for management of post operative endophthalmitis, we still have to use our best judgment in managing such cases. Although many mechanisms have been postulated, it seems that in majority of cases the entry of bacteria occurs at the time of surgery. The belief is that initially the main locus and bulk of infection is in the anterior chamber and capsular bag with IOL. Thus intracameral infusion of antibiotic solution is being used for prophylaxis by many ophthalmic surgeons. This article describes the success of anterior chamber wash with antibiotic solution in cases of acute post operative endophthalmitis after cataract surgery.

II. Material And Methods

The study is a retrospective analysis of 44 patients of infections cluster post operative endophthalmitis. The patients have been classified into three groups based on the treatment strategy that was administered to the patients.

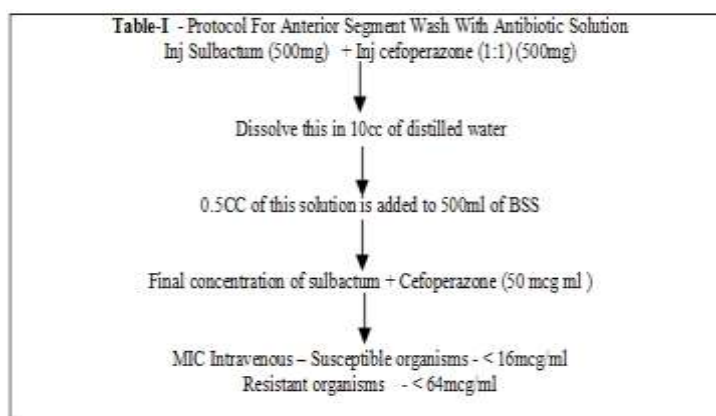
Group A		Group B		Group C
Intravitreal Antibiotics Only		Intravitreal Antibiotics + Anterior Segment Wash		Intravitreal Antibiotics + Vitrectomy
Prior To Year 2000		Year 2000 Onwards		Year 2000 Onwards
12 Cases		20 Cases		12 Cases
06 Cases *Responded Well *>6/24 Bcva	06 Cases *Phthisical	Intravitreal (Amikacin+Vancomycin) + Ac Wash (Vancomycin)	Intravitreal (Vanco+Ceftazidime) + Ac Wash (Sulbactam + Cefoperazone)	Criteria For Vitrectomy I) Vision Pl + Ii) Marked Media Haze (No Glow) Iii) No Response To Intravitreal In 24 Hrs Iv) Deteriorations Of Clinical Condition V) USG -Multiple Echoes In Vitreous Cavity Vi) Patients Presenting Late * Results :- I) 02 Cases -Rd- Rd Surgery >6/6 BCVA)
		* All 20 Cases - >6/18 BCVA * No Oil Was Explanted		

				Ii) 02 Cases- 2 IOL (6/6-6/12 BCVA Iii) 08 Cases- Opaque/Phthisical Globes.
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All patients suspected of having acute post phaco endophthalmitis were instituted conventional therapy in form of:-

- (i) Antimicrobial treatment (Intravitreal and topical)
- (ii) Anti inflammatory therapy (systemic and topical)
- (iii) Supportive treatment
- (iv) Vitrectomy on presentation was the preferred option in :-
 - (a) Vision grossly reduced – PL+ PR *
 - (b) Marked media haze (Faint or no glow)
 - (c) No response to Intravitreal in 24 hrs
 - (d) Rapid deterioration of clinical condition.
 - (e) Patients presenting late
 - (f) USG multiple echoes in vitreous cavity

Vitreous tap specimens were sent for staining, culture and antibiotic sensitivity testing in all case. AB scan ultrasound was done in all cases at presentation for vitritis and retinal detachment. All patients were administered Intravitreal antibiotics at presentation and assessed after 6 hrs and 12 hrs. Patient who deteriorated or who did not have a definite improvement were subjected to an anterior segment wash with antibiotic solution along with removal and peeling of exudates and membranes from anterior chamber, pupil, around the IOL and the capsular bag. This was done using a set protocol (Table-1).



Definite clinical improvement was seen in 24 hrs of performing an anterior segment wash. In a few situations when the clinical condition remained same or deteriorated, the Intravitreal antibiotics and anterior segment antibiotic wash was repeated.

III. Discussion

Our belief and experience has shown that the main locus and reservoir of infection is in the anterior chamber and capsular bag with IOL. Ophthalmic surgeons have been using intracameral Inj Vancomycin, Moxifloxacin etc as a bolus directly into the capsular bag behind the IOL just before completing the surgery. Dr Paola Arpa in vitreoretinal surgery round table conference recommended IOL and capsule excision in order to eliminate the substrates where the pathogens find favorable growth conditions. However, in less compromised cases, he was more conservative where he cut only the posterior capsule by a vitrectome and penetrated into the capsules recess to wash it with the same antibiotic solution used for the infusion. In a few instance, Dr Paola Arpa maintained that the infection is limited to the anterior segment only. In such cases after the diagnostic procedure it is possible to wash the anterior chamber with a solution of antibiotics where good results may be obtained, but there may be a temporary worsening in the corneal condition. It has been amply elucidated in this study that is the anterior segment which is initially the locus and reservoir of infection and the phaco wound is the entry point of infection in majority of cases. It is only later in the course of the disease process that the

infection spreads to the vitreous cavity to involve the posterior segment. It is possible that by administering intravitreal antibiotics the infection gets controlled in the vitreous cavity, but the drug may not achieve bactericidal levels in the anterior segment where the majority of the infection resides in cases which present early.

In our opinion, along with intravitreal antibiotics the anterior segment has to be dealt with as well. The antibiotic wash of anterior segment is an effective mechanism to eliminate microbes instantaneously along with removal of debris and fibrinous exudates.

Anterior segment antibiotic wash is undertaken if there is no definite response within 6-12 hrs of intravitreal injection. The signs of improvement are decrease in pain, improvement in vision, reduction in height of hypopyon, improved fundal glow and media clarity. (This is in contradiction to EVS study where the intravitreal is repeated after).

The infective process in acute post phaco endophthalmitis is dramatic and rapid. Thus holding back the treatment for the choice of antibiotic till bacterial cultures and antibiotic sensitivity results have been received can be catastrophic. We deal with both the anterior and posterior segments with effective concentration of antibiotics and see the response before proceeding to vitrectomy. Post experience has shown that vitrectomy needs to be resorted to in a large majority of cases can the final outcomes are not very favorable. These inflamed eyes have concomitant retinal vasculitis and retinal edema thus increasing the chances of iatrogenic retinal breaks and retinal detachment. Post vitrectomy some patient's continue to have diminished vision which is further hampered by post vitrectomy complications. Since the adoption of this procedure of anterior segment wash, we have observed that the numbers of patients undergoing vitrectomy have substantially declined.

In the developing world the health care facilities are limited and vitreoretinal surgical centers are few. Either the surgical facilities are inadequate or located at a far off distance. The equipment needed to perform. Vitrectomies, the technical know how and surgical expertises to carry out such complex procedures are insufficient. In such circumstances, before a patient is transferred which involves logistic hassles and delays; the procedure of anterior segment antibiotic wash comes as a boon for the treating ophthalmologist. The phaco surgeon himself can attempt the procedure through the same phaco entry wound.

Even in desperate situations this procedure works well by diffusion of antibiotic from the anterior to posterior segment. A key point which needs to be emphasized at this juncture is that anterior segment antibiotic wash is not intended to be a substitute but an adjunct to the existing guidelines of managing acute post phaco endophthalmitis.

In tertiary eye care centers in multispecialty hospitals such as ours, the proximity of intensive care units emergency surgical wards and burns unit to the operation theatres is well known. Also there are issues of lines and instruments being sent from intensive care units and acute wards for autoclaving to the CSSD (Central sterile supply Dept) which is located adjacent to the operation theatres. This could relate to the high incidence of gram- re infection (>80%) in our series.

Following these trends, in early 2003 we switched over to a Broad spectrum sulbactam and cefoperazone combination which was active against gram +ve, gram-ve as well as anaerobes. This empirical use of wide spectrum antibiotic was aimed at knocking out any infection instantaneously as waiting for culture and antibiotic sensitivity would be catastrophic. This therapy relies on the rupture of blood aqueous barrier which increases the drug permeability in intraocular cavity. The concentration of these bactericidal drugs administered systemically was through to achieve a sufficient kill rate due to the ruptured blood aqueous barriers. Our assumption was that if we administered a marginally comes concentration of the drug than MIC levels intravenously, we would achieve an excellent bactericidal result without compromising the safety.

In 1996 we had started off with Gentamicin but immediately discarded it because of its corneal toxicity. Later we switched over to vancomycin but this drug also fell out of favor as we were mainly dealing with gram-ve infections. Also vancomycin has a slow kill curve so that the drug drains out of the eye through the orbicular meshwork before it has a chance to be effective.

In early 2003 we had a cluster infection of 06 cases and decided to use the latest and the best available wide spectrum antibiotic combination. The choice narrowed down to sulbactam and cefoperazone and the concentration to be used was decided to be marginally lower than MIC levels intravenously. The MIC level of cefoperazone in blood is >64 mcg/ml for resistant organisms and < 16 mcg/ml for susceptible organisms. For the anterior segment wash we keep the concentration at 50 mcg/ml so as to have a high bactericidal rate as also to avoid corneal toxicity.

The only impediment for its use for anterior segment wash was the issue of corneal toxicity as there have been no reports till date of such procedures being undertaken.

IV Conclusion

The limitations of the EVS today result from multiple new surgical techniques susceptible to postoperative infection—but not included in the EVS protocol, alternate interpretation of its results based on potential complications rather than vision differences, the evolution of new surgical techniques and viewing apparatus, and the development of new pharmacological agents with improved ocular penetration. In addition, the EVS left many other management questions unanswered including use of intraocular steroids. Results of the EVS, however, still serve as a primer and able platform from which vitreoretinal surgeons may base current management of postoperative endophthalmitis. Like all medical conditions, the number of presenting historical and clinical variables is large. Even well-performed randomized prospective studies have their limits as well as ‘shelf life’ due to the normal pace of medical innovation and discovery.⁵ As physicians and surgeons, we are a product of training and experience. Introduction of bias into the treatment equation is a normal consequence of complicated and multi-factorial disease states. This does not necessarily make one approach correct or not, only different.

As has been already mentioned that in spite of extensive research and set guidelines for management of endophthalmitis, we still have to use our best judgment in difficult situations. And fortunately Anterior chamber antibiotic wash has worked well for us and this procedure is now an indispensable arm in managing acute postoperative endophthalmitis cases.

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