TRAUMATIC ENDOPHTHALMITIS IN CHILDREN
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ABSTRACT: AIM: To study the clinical profile and visual outcome in children with traumatic endophthalmitis undergoing vitrectomy. METHODS: A retrospective analysis was performed from hospital records of Minto ophthalmic hospital, Bangalore between 1st April 2014 to 31st March 2015 on traumatic endophthalmitis in children less than 15 yrs. Complete ocular examination along with B scan was done and endophthalmitis was confirmed. Systemic evaluation and necessary blood investigations for general anaesthesia were done. 23 Gauge Three port pars plana Vitrectomy was done as early as possible. RESULTS: A total of ten children with traumatic endophthalmitis who underwent vitrectomy for traumatic endophthalmitis between July 2014 to April 2015 were studied. Nine cases presented with corneal tear and one case presented with self-sealed scleral tear. Nine cases underwent primary tear repair with intravitreal antibiotics, followed by an early vitrectomy and one case underwent primary tear repair and vitrectomy as a single procedure. Vitreous biopsy was sent for grams stain, KOH mount and culture and sensitivity. Nine cases underwent lensectomy along with vitrectomy. One case underwent repeat vitrectomy after 4 day since the exudates filled the vitreous cavity. Two cases developed retinal detachment and underwent surgery for the same. At the end of two months 3 cases had vision of 6/24 or better, three cases had vision of 1/60 and 4 cases had total retinal detachment with subsequent phthisis bulbi. CONCLUSION: Nature of injury, delay in communication by the children, delay in observation by the parents, delay in arrival for treatment and virulence of the organism may result in poor visual prognosis in children with endophthalmitis. KEYWORDS: Endophthalmitis, 23 Gauge Three port pars plana vitrectomy.

INTRODUCTION: Trauma is one of the leading cause for uniocular blindness world-wide.1 According to WHO declaration 55 million ocular injuries occur world wide and 1.6 million become blind.2 Endophthalmitis is defined as an intraocular inflammation which predominantly affects the inner spaces of the eye and their contents, that is the vitreous and/or the anterior chamber.3 Endophthalmitis is the most serious complication after any penetrating ocular injury.2,4 It occurs due to invasion of virulent organism into the eye during penetrating trauma.4

MATERIALS AND METHODS: A retrospective analysis of vitrectomy performed for traumatic endophthalmitis in children was done from hospital records of Minto ophthalmic hospital, Bangalore between 1st April 2014 to 31st March 2015.
Inclusion Criteria:
- Patients less than 15 years.
- Traumatic Endophthalmitis which underwent vitrectomy.

Exclusion Criteria: Non penetrating ocular trauma.

Cases which improved with intravitreal antibiotics.

General history noted including the age, sex, mode of injury, eye affected, mode of injury, time of initial presentation, history of earlier treatment if done elsewhere. In three cases history was elicited retrospectively after the parents noticed redness of the eye in their children. Seven cases with corneal tear had undergone primary corneal tear repair in our institution and were referred to vitreoretinal department, one case had undergone primary corneal tear elsewhere and later referred, one case had undergone corneal tear repair and lensectomy and later referred. Clinical examination of the eye was performed. Visual acuity was recorded in both the eyes using Snellen chart, counting fingers or IDO light. Anterior segment slit lamp examination was performed. Posterior segment examination was done using slit lamp and indirect ophthalmoscopy. B scan was done using Alcon on cases who had undergone primary repair and in self-sealed corneal tear. Transverse, longitudinal and axial scans were done. Medium reflective echogenic membranes in vitreous cavity and thickening of retinochoroidal layer noted. Endophthalmitis was confirmed. Necessary blood investigations were done. X-ray orbit lateral and anteroposterior view were done to rule out intraocular foreign body in all cases.

All cases were started on topical moxifloxacin hourly and intravenous ciprofloxacin (10mg/kg of body weight) the dose calculated depending on the weight of the child.

Decision to perform vitrectomy was done. Criteria for vitrectomy were based on Endophthalmitis vitrectomy study.
1. Vision less than hand movements,
2. Hypopyon in anterior chamber and thick exudates in vitreous cavity.

All cases were taken up for surgery under general anaesthesia. Twenty three gauge vitrectomy set was used. Vitreous biopsy was taken in all cases before starting the infusion using 2cc syringe attached to suction tubing of vitreous cutter. Lensectomy was done in eight cases who had cataract. Core Vitrectomy was done, PVD induction attempted in all cases however it was not possible. Intravitreal antibiotics Vancomycin 1mg in 0.1ml and Ceftazidime 2.25mg in 0.1ml was given in all cases. In four cases additional intravitreal antifungal Amphotericin- B was given.

RESULTS: From retrospective analysis of cases from April 2014 to 31 March 2015, total of 37 cases underwent vitrectomy for endophthalmitis among which 10(27.03%) were for traumatic endophthalmitis in children less than 16 years of age.

In this study equal number of males and females were affected (5 males and 5 females). The youngest child was 18months and oldest was 11 years old. Mean age was 5.75 years. None of the cases had intraocular foreign bodies. All cases were on close follow up. One case of eleven year old female developed thick hypopyon the next day which increased on subsequent days.
Anterior chamber wash and intravitreal antibiotics and antifungals were repeated after twenty four hours. Decision for repeat vitrectomy was taken when exudates increased. Subsequently the eye developed phthisis bulbi.

One case with lens sparing vitrectomy developed superior retinal detachment with sparing of macula. She underwent surgery for the same and maintained good vision of 6/12 on 3 months follow up.

| Sl. No. | Age/sex | Duration | Mode of injury | Self/Bystander | Presentation | Vision at presentation | Vision at 3 M |
|--------|---------|----------|----------------|----------------|--------------|------------------------|--------------|
| 1      | 8y/m    | 8hr      | stick          | Self           | Corneal tear | HM+                   | 1/60         |
| 2      | 3yr/m   | >48hr    | stick          | bystander      | Corneal tear | HM+                   | 6/12         |
| 3      | 9yr/m   | 8hr      | scissors       | Self           | Corneal tear, iris prolapse | PL+         | phthisis              |
| 4      | 3yr/f   | >36hr    | needle         | bystander      | Self-sealed scleral tear | 1/60       | 6/12                   |
| 5      | 1.5yr/f | 8hr      | belt           | bystander      | Corneal tear, iris prolapse | PL+         | phthisis              |
| 6      | 5yr/m   | 6hr      | stick          | bystander      | Corneo scleral tear, iris prolapse | PL+         | 3/60                   |
| 7      | 11yr/f  | >24hr    | stick          | Self           | Corneal tear | HM+                   | phthisis    |
| 8      | 3yr/m   | >24hr    | stick          | bystander      | Corneal tear | HM+                   | 6/24         |
| 9      | 6yr/m   | 10hr     | stick          | Self           | Corneal tear | HM+                   | 3/60         |
| 10     | 8yr/m   | >24hr    | pencil         | bystander      | Corneal tear | PL+                   | phthisis    |

**Table 1**

**DISCUSSION:** Endophthalmitis is a potentially devastating complication of open globe injuries. Children suffer a higher percentage of open globe injuries than adults comprising 19-58% of all cases of ocular trauma. Ocular trauma is the leading cause of monocular blindness worldwide. Delayed repair of penetrating ocular trauma is among the major risk factors for development of infective endophthalmitis. In a study by Sameer afjal et al in 2010 it was observed that 46.6% subjects reported after 24 hours of trauma. In a study from India 48.62% of patients reported after 24 hours. In our study 50% cases reported after 24 hours which is in accordance with the aforementioned studies. In our study 4(40%) children had self-inflicted injuries while six (60%) were bystanders.

In a previous study from Europe, among 7 cases who underwent vitrectomy for endophthalmitis 5(71%) cases improved in vision. In our study 6 out of 10 cases had improvement in vision however 3(30%) cases have visual acuity of 6/24 or better. Four cases developed total retinal detachment and phthisis bulbi. Retinal detachment could be due to trauma or retinal necrosis leading to multiple retinal breaks.

B scan which is a non-invasive technique helps in early diagnosis of posterior segment pathology. In our case series all cases had B scans and this helped in diagnosis, management and follow up of cases.
In previous case series of traumatic endophthalmitis streptococcal species was found in 55.6% of cases that was culture positive while staphylococcus epidemidis and bacillus series was positive in 12.5% case.\textsuperscript{8} In our study grams stain, KOH mount and culture and sensitivity of vitreous biopsy did not yield positive results for bacteria or fungus. May be polymerase chain reaction would have been a better choice. In previous studies polymerase chain reaction was found to give a much more sensitive and rapid result than gram stain and culture technique with comparable high specificity.\textsuperscript{9} PCR adds new information in diagnosis of infectious endophthalmitis.\textsuperscript{6}

CONCLUSION: Early diagnosis and management of endophthalmitis is a major prognostic factor for the final visual outcome. However in children additional factors in the form of nature of injury, delay in communication by the children, delay in observation by the parents, delay in arrival for treatment and virulence of the organism may result in a more-poor visual prognosis in children with endophthalmitis.

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