



HYPERHEMA DUE TO BLUNT INJURY: A REVIEW OF 100 PATIENTS

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ABSTRACT

Purpose- To determine the causes, associated ocular findings and visual acuity on presentation, complications and visual outcome following treatment in patients of hyphema due to blunt injury **Methods-** A retrospective study was performed in 100 patients with hyphema due to blunt injury admitted to Maharani Laxmi Bai Medical college, Jhansi. The gender, age, race, cause of blunt injury resulting in hyphema, eye involved, vision at admission, other associated ophthalmological findings, complications and visual outcome were noted from the case records of patients. **Results-** Males were more predominantly affected (83%). 65% patients were aged below 30 years. Sports related injury (42%) was the most common cause for hyphema. Hyphema disappeared within 5 days in 67% of patients. Iris injuries were very commonly associated in the form of mydriasis, sphincter tear and iridodialysis. Associated vitreous haemorrhage was noted in 12% of patients. During the hospital stay, secondary haemorrhage was observed in 4% of patients. The best corrected vision of 6/18 or better was noted in 86% of patients at the last follow-up. The follow-up of these subjects was very poor and thus the incidence of secondary glaucoma could not be established. **Conclusion-** Most common cause of hyphema in India is sports related injuries. Good visual recovery, without serious complications, is possible with appropriate and in-time treatment in hyphema patients due to blunt injury.

KEYWORDS : blunt injury, hyphema, sports injury.

INTRODUCTION

Injury to the eye is one of the most common causes of unilateral blindness worldwide. Hyphema is defined as a collection of blood in the anterior chamber of the eye. Microhyphema is a small amount of blood that is visible only under microscopic examination. Hyphema is most commonly caused by blunt or penetrating trauma. Hyphema and concomitant injuries to ocular structures following blunt trauma are not an infrequent cause of presentation to the emergency unit in many hospitals^{[1][5]}. Even small amounts of blood within the anterior chamber can lead to complications such as glaucoma, corneal blood staining, and secondary hemorrhage; thus, proper management of this condition is crucial to prevent loss of vision. Recognition of factors related to poor visual outcome, appropriate medical therapy, surgical intervention when indicated and careful follow up will help in preserving vision in these patients. Posterior segment injuries^[6], size of hyphema at presentation and retinal damage^[7] have been reported to be significant predictors of poor visual outcome in these patients; while topical steroids and/or cycloplegic medication^[7] and occurrence of secondary haemorrhage^{[6][7]} did not influence the final visual outcome.

MATERIAL AND METHOD

This is a retrospective study of 100 patients with traumatic hyphaema due to blunt injury treated in the emergency department and ophthalmic OPD in Maharani Laxmi Bai Medical college, Jhansi over a period of 1 year. After taking history, visual acuity was tested on Snellen chart and the anterior segment was examined with slit-lamp biomicroscope. Intraocular pressure (IOP) was measured with applanation tonometer and fundus examination was done after dilating pupil with 2.5% phenylephrine eye drops using 90D lens and slit-lamp.

METHODS:

The age, gender, race, type of blunt injury, vision at admission, other ocular findings, grading of hyphema, treatment given, time taken for absorption of hyphema, follow-up period, complications and best corrected vision at last follow-up were noted from the patients' records. Based on the level of blood in the anterior chamber (AC) at slit-lamp examination, hyphema was graded as microscopic hyphema when no clot was present (circulating red blood cells only),

- Grade I - blood filling < 1/3 of AC,
- Grade II - blood filling < 1/2 of AC,
- Grade III - blood filling more than 1/2 of AC,
- Grade IV - total hyphema with red or black clots^[1].

The standard protocol of management of hyphema was followed which included admission to the hospital, complete bed rest with restricted ambulation, head elevation upto 45 degrees was done, patching the affected eye with rigid shield, using topical cycloplegics (homatropine 20g/L eye drops bd), corticosteroid (dexamethasone

1g/L eye drops qid), and Tab. Vitamin C 500 mg daily. Eyes with raised intraocular pressure were treated with timolol 5g/L eye drops bd, and Tab. Acetazolamide 250 mg tds. When the IOP was high (more than 30mmHg) in spite of glaucoma medications, IV mannitol was given. Surgical evacuation of the blood was performed in eyes with total hyphema and uncontrolled intraocular pressure with medication. Patients were monitored of blood level in the anterior chamber, visual acuity and intraocular pressure daily during their stay in the hospital. Secondary haemorrhage was diagnosed if the size of hyphema was increased or if fresh blood was present in the anterior chamber. Gonioscopy was performed during the examination in first follow-up visit. The angle appearance was noted according to Shaffer classification from grade 0 to grade IV angle and abnormalities such as angle recession and peripheral anterior synechiae were also noted. In patients where gonioscopy was not done, it was listed as not done while noting down the findings from records. The above data were tabulated and analyzed using SPSS programme.

Statistical Analysis:

The data was entered regularly. Nominal data was presented as numbers & percentage. Data analysis & percentage calculation was done using Microsoft Office Excel.

RESULTS

Majority of patients were males (82%) i.e; 82 patients out of 100.

Table 1: Distribution of patients according to the age

Age	Number of patients	Percentage
5-20	31	31%
21-30	29	29%
31-40	18	18%
41-50	17	17%
51-60	5	5%

Hyphema was present in one eye only in all the patients in our study, and 62 eyes (62%) were in the right; 38 eyes (38%) were in the left. Sports injuries (n=42, 42%) were the most common cause of hyphema, the others being industrial (n=29, 29%), home (n=24, 24%) and motor vehicle accidents (n=5, 5%).

Table 2: Different objects responsible for blunt injury in 100 patients with hyphema.

Different objects	Number of patients	Percentage
Football	12	12%
Table tennis ball	11	11%
Shuttlecock	15	15%

Wooden stick	13	13%
Fire cracker	12	12%
Metal piece	9	9%
Nail	8	8%
Wire	6	6%
Screw driver	5	5%
Battery explosion	5	5%
Racquet	4	4%

Table 3: Distribution of patients according to visual acuity at the time of presentation

Visual acuity	Number of patients	Percentage
6/60	29	29%
6/12	16	16%
Hand movement positive	11	11%
PL positive	9	9%
6/36	10	10%
6/24	10	10%
6/18	5	5%
Normal	10	10%

The IOP at admission ranged between 8 and 46 mmHg. The IOP of 20 mmHg or below was seen in 79(79%) patients; 12 (12%) had 21-30mmHg and 9(9%) had >30mmHg. Echymosis/haematoma of patients, sub conjunctival haemorrhage seen in some patients. There was no fracture of orbital bones in any of the patients. The most common form of hyphema in our study was grade I, seen in 50 (50%) patients, Grade II in 25 (25%), Grade III in 15 (15%), Grade IV in 10 (10%).

Table 4: Distribution of patients according to the hyphema grading

Hyphema grading	Number of patients	percentage
Grade I	52	52%
Grade II	23	23%
Grade III	15	15%
Grade IV	10	10%



Image 1: Patient with Grade IV Hyphema in Left Eye.

Patients with grade III/IV hyphema had associated periorbital haematoma in 16 patients, traumatic mydriasis in 19 patients and iridodialysis in 2 patients. All patients were treated as per the standard protocol as mentioned in the methods. Surgical intervention was needed only in 2 elderly patients of grade IV hyphema (vision only hand movements) in whom the IOP did not come down to normal level in spite of medical treatment. Paracentesis and evacuation of blood clot was done in both patients.

The IOP was controlled with medical treatment. The best corrected vision improved to 6/18 in one patient. However, the other patient developed moderate blood staining of cornea and vision improved to only 6/60. This patient had cataract in the affected eye; following extracapsular cataract extraction and posterior chamber intraocular lens implantation, the best corrected vision improved to 6/24 only. The IOP on discharge was 20 mm Hg or below in 90 (90%) patients and between 21 and 30 mm Hg in 3 (3%) patients.

The IOP came to normal reading with continued glaucoma medication in these 3 patients during the follow up examination after 3 weeks. The time taken for absorption of hyphema ranged between 2 and 20 days;

(67%) hyphema was absorbed within 5 days. All these patients were discharged from the hospital only after complete absorption of hyphema

DISCUSSION & CONCLUSION

The higher frequency of hyphema in males in our study is because of more males working in different industries, their participation in sports and their involvement in assaults/accidents. The male to female ratio in our study (2.5:1) is similar to that reported from Nigeria^{[5][48]}. Two-thirds of patients in our study were young (below 30 years) and a similar figure was reported from UK (77%)^[3]. In our study, sports/games related injuries were the most common cause for hyphema (42%), of which shuttle badminton game accounted for 15 out of 42 cases. The ocular injury in this game occurs commonly with round ended shuttle cock in the smash hit by opponent player in the single game, while the injury is due to long stick end of the racket of the partner player or with shuttle cock hit by the opponent player in the doubles game. Getting injury to the eye is an unacceptable price while playing this game. Wearing the protective glasses during play like in squash game can prevent ocular injuries. Sports/play related injuries reported from UK (49.2%)^[3], Nigeria (42.1%)^[5] and Pakistan (66.6%)^[4] are much higher than our study (38.1%). However, a much lower figure (9.1%)^[6] has been reported in a recent study of 472 cases of hyphema from Nigeria. Industrial accidents/accidents at work place responsible for hyphema were more common in foreigners (Indonesians, Bangladeshis) because majority of the construction workers/people working in factories are from Indonesia and Bangladesh. Kearns^[3] reported accident at work was the cause of hyphema in 9.9% of patients in UK, while a less frequency of the same (7.6%)^[6] was observed in Nigeria. Domestic causes/injury at home was responsible for hyphema in 13.5% of the cases in our study, while the same was higher (17.8%)^[3] in UK patients. However, a much lower figures (7.9%)^[5] and 2.5%^[8] were reported in Nigerian patients. Secondary haemorrhage was seen on second day after trauma in 3.4% of patients, while the same was reported to be varying between 3.8%^[6], 4.1%^[3], 6.7%^[2], 8.7%^[9] and 9.2%^[5] of patients in different countries. Secondary haemorrhage was seen on second day after trauma in 3.4% of patients, while the same was reported to be varying between 3.8%^[6], 4.1%^[3], 6.7%^[2], 8.7%^[9] and 9.2%^[5] of patients in different countries. The main treatment is bed rest and topical medical therapy to prevent iritis. Visual acuity and intraocular pressure are to be monitored daily during the hospitalization of the patient. Surgical evacuation of the blood has to be done when the IOP is 50 mm Hg for >5 days, or 30mmHg for >7 days inspite of maximal anti glaucoma medications; when there is no sign of absorption of blood within 3-4 days after injury in patients with total hyphema and when there is impending blood staining of cornea. The optimum duration of surgery is 5th to 7th day after injury for the following reasons: 1) if the IOP is normal, blood staining of cornea is unlikely to occur after 5th day of trauma; 2) too early attempts to remove the blood clot may in fact cause further bleeding because of manipulations in the anterior chamber, sudden lowering of IOP and dislodgement of clot; 3) surgery after 7 days of injury would be difficult due to firm adhesions and fibrosis; 4) new blood vessels and organization of clots occur within the first 5 days after trauma; 5) secondary haemorrhage mostly occurs in the first 4 days after trauma^[10]. The best corrected vision of 6/18 or better in 85.6% of patients in our study indicates the beneficial effect of appropriate and in-time treatment in patients of hyphema due to blunt trauma. The causes of poor vision in the rest of patients were the effects of associated retinal findings such as commotion retinae, macular edema and scarring, macular hole and secondary glaucoma. Wearing protective glasses during shuttle badminton, squash games and at work places, supervision of children while playing, dissemination of preventive methods of eye injuries through media and in the schools/colleges will help to reduce the ocular morbidity in young patients.

RESULT

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