Original Article

Management of Traumatic Hyphema with Raised Intraocular Pressure

Bakht Samar Khan, Ibrar Hussain, Abid Nawaz

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See end of article for authors affiliations

Correspondence to:
Bakht Samar Khan
Eye "B" Unit,
Khyber Teaching Hospital
Peshawar

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Purpose: To find out the incidence of high IOP (≥ 25 mm Hg), its management and visual outcome in traumatic hyphema patients.

Material and Methods: A retrospective study was carried out of all patients with traumatic hyphema admitted to Khyber Teaching Hospital Peshawar between January 2003 and December 2004.

Results: Out of 118 patients with traumatic hyphema requiring hospitalization high IOP was found in 50 cases. Amongst these more than 60% had an IOP≥45mm Hg. The mean age at time of presentation was 7 years. Glaucoma was controlled in 26% cases by medical means while 74% needed surgical intervention. Visual out come was 6/12 or better in 22% cases.

Conclusion: Surprisingly traumatic hyphema with raised IOP has high incidence and poor visual outcome than expected.

Hyphema is not an uncommon intraocular pathology. The incidence has been reported as 17-24 100,000 population[1]. The peak incidence is below 20 year of age. Blunt trauma ruptures vessels of iris stroma and ciliary body by antero posterior compression and equatorial globe expansion, which causes stress. A lacerating injury directly damages the blood vessels and causes hypotony.

Both these cause hyphema. Hyphema can also occur after intraocular surgery. Hyphema absorption occurs through the anterior surface of iris.[2] Uncomplicated hyphema clears in about a week. The serious complications of hyphema include raised IOP corneal staining and poor VA. One third of all hyphema patients have increased IOP. The IOP is elevated for several reasons. These are,

1. Occlusion of trabecular meshwork by clot, inflammatory cell or RBC debris.
2. Pupillary block due to blood clot.
3. Peripheral anterior synechiae.
4. Other late causes include damaged trabecular meshwork with angle recession, fibrosis of trabecular meshwork, siderosis of trabecular endothelium[3] and ghost cell glaucoma[4].

The raised IOP in hyphema is treated medically, if these measures fails, surgical intervention is required. Despite of all these measures the final visual acuity in traumatic hyphema is not satisfactory. This is either due to uncontrolled glaucoma or corneal blood staining. The purpose of this study is to find out the incidence of glaucoma with hyphema, its acceptable management and the visual outcome.

MATERIAL AND METHODS

A retrospective study of all patients with traumatic hyphema admitted to Khyber Teaching Hospital Peshawar was carried out between January 2003 and December 2004. History charts of these patients were reviewed and the examination data was analyzed. This included VA recording both with and without correction, corneal pathology likes edema and blood staining, the size and colour of hyphema and daily

hyphema drawing, cells and flare in the anterior chamber, synechiae, pupillary reaction, lens pathology, daily morning and evening IOP measurement with applanation tonometer and fundus examination.

Traumatic hyphema patients with retinal detachment, ectopia lentis, traumatic maculopathy and those patients requiring only outdoor treatment were excluded from the study.

RESULTS

The study comprised a total of 118 cases of hyphema admitted in KTH, Peshawar. The males being 63% and female 37% (Table 1). Among these, 50 cases (42.37 %) were associated with raised IOP. The highest incidence of hyphema with and without raised IOP was in patients up to 10 years of age (Table 2).

In 9 cases (18%) the IOP range was 25 to 30 mm Hg, in 8 cases (16%) it was 31 to 45 mm Hg, while in 33 cases (66%) it was more than 45 mm Hg (Table 3).

Table 1: Hyphema and Glaucoma

Intraocular pressure	No. of eyes n (%)
High IOP (≥ 22 mmHg)	50 (42.37)
Within Normal limit	68 (57.63)
Total	118 (100)

Table 2: Age distribution

Age	Hyphema	No. of eyes with increased IOP
Up to 5 years	30	14 (21.34%)
05 – 10 Years	45	21(46.66%)
11 – 20 years	18	6 (33.33%)
21 – 40 years	15	6 (40%)
41 +	29	3 (10.30%)

Table 3: Raised Intraocular Pressure

No. of eyes	IOP range (%)
9	25 – 30 (18)
8	31 – 45 (16)
33	> 45 (66)

Visual acuity at the time of admission was doubtful perception of light in 11 eyes, (22%), perception of light with good projection in 18 eyes (36%) and CF in 31 eyes (62%) (Table 4)

In 13 eyes (26%) raised IOP was successfully managed by medical means while in 37 eyes (74%) surgical intervention was required. This consisted of paracentasis and evacuation in 7 eyes (14%), paracentasis and peripheral iridectomy in 6 eyes (12%), trabeculectomy in 12 eyes (24%), trabeculectomy with mitomycine in 7 eyes (14%) and extra capsular cataract extraction with intraocular lens implant in 5 eyes (10%). (Table 5).

On discharge VA was 6/12 or better in 11 eyes (22%), up to 6/18 in 6 eyes (12%), up to 6/60 in 15 eyes (30%), while up to 3/60 in 6 eyes (12%) and doubtful perception in 12 eyes (24%). (Table 6).

Table 4: Visual acuity at presentation

VA	No. of eyes n (%)
PL±	11 (22)
PL with good projection	18 (36)
CF	21 (42)

Table 5: Management

No	Procedure	No. of eyes n (%)
A	Medication (controlled)	13 (26)
B	Surgical (controlled)	37 (74)
(i)	Paracentasis & Evacuation	07 (14)
(ii)	Paracentasis with PI	06 (12)
(iii)	Trabeculectomy	12 (24)
(iv)	Trabeculectomy with MMC	07 (14)
(v)	ECCE with IOL	05 (10)

Table 6: Visual acuity at discharge

VA	No. of eyes n (%)
PL±	12 (24)
Up to 3/60	06 (12)
Up to 6/60	15 (30)
Up to 6/18	06 (12)
6/12 or better	11 (22)

DISCUSSION

Hyphema with raised IOP is an ocular emergency. The majority of patients are children or young individuals. Negral reported 5-16% of all admissions to be related to eye injuries[5].

DeRespinis et al found that the most common admitting diagnosis in children sustaining ocular trauma was hyphema 32%[6].

Evaluating the age and sex distribution, traumatic hyphema has been reported to be more frequent in children, predominantly affecting the males[8-9)].

In this study a raised IOP (≥ 25 mm Hg) was found in 42.37% of cases with hyphema. This compares with the previously reported incidence by various authors[10].

Coler bryon	14 – 60 %
Henry	14 – 51 %
Kitazawa	07 – 67 %
Shea	02 – 25 %

In study conducted at Abbasi Hospital Karachi, by Fasih et al reported that hyphema was present in 22.22% of patients sustaining ocular injuries while glaucoma due to hyphema was found in 50%[11]. In another study conducted at Postgraduate Medical Institute, Lady Reading Hospital Peshawar, raised IOP was found in 41.66% of cases with hyphema[12]. One-third of these cases required surgical intervention. The medical management of hyphema with raised IOP includes the use of steroids and antiglaucoma agents. Steroids can be used topically and systemically. They control the inflammation, stabilize the blood ocular barrier and reduce the congestion of blood vessels to decrease the risk of rebleeding.

Negra et al studied 462 cases in 10 years and concluded that steroids decreased rebleeding and inflammation[13]. To control IOP topical/systemic antiglaucoma agents are given. They include:

- Carbonic Anhydrase inhibitors (Topical/ systemic)
- Topical β blocker
- Hyperosmotic agents in cases unresponsive to the above medications
- In addition cycloplegic and antiemetics are given in selected cases and analgesic may be required for symptomatic relief of pain

With this regime 1/4th of our cases were controlled whereas the remaining 3/4th required surgical intervention. This was undertaken in cases with raised IOP despite maximal medical therapy non-resolving total hyphema.

There are various criteria for surgical intervention reported in the literature. Important one are;

A) Read and Goldberg criteria supported by Deutch et al[14].

1. IOP> x 60 mm Hg for 2 days
2. IOP> x 25 mm Hg + total Hyphema for 5 days
3. Microscopic corneal blood staining
4. Hyphema absorption < 50% by 8 days
5. Sickle cell disease or trait + IOP 24 mm Hg for 1st 24 hours or IOP spike of 30 mm Hg.

B) Walton et al criteria[10]

1. Microscopic corneal staining
2. Risk of optic atrophy (unacceptable IOP)
3. Risk of corneal blood staining e.g. IOP ≥ 25 mm Hg + 50 % Hyphema
4. Risk of synechiae formation e.g. Hyphema ≥ 8 days

Even after following the above criteria the final VA is not what one would expect. The visual prognosis is, of course, much favorable in simple hyphema with normal IOP. Gilbert and Jensen reported a visual acuity worse than 6/12 in 86% of patients with hyphema and associated complications and in 14% of cases with simple hyphema, whereas this incidence was reported, respectively as 92% and 8% by Gregersen, 67% and 33% by Read and Goldberg [10]. This compares with our study (78% and 22%).

The cases responding well to medical treatment have obviously, a better prognosis. In unresponsive cases early surgical intervention is advisable: such an intervention however may be associated at times, with its own complications. These are, mainly cataract formation, infectious and intense inflammation.

CONCLUSION

Glaucoma is one of the leading complications of traumatic hyphema. In medically uncontrolled glaucoma early surgical intervention is recommended.

Author's affiliation
Dr. Bakht Samar Khan
Senior Registrar,
Eye "B" Unit,
Khyber Teaching Hospital
Peshawar
Dr. Ibrar Hussain
Assistant Professor
Eye "B" Unit
Khyber Teaching Hospital
Peshawar

Dr. Abid Nawaz
Associate Professor
Department of ophthalmology
Kabir medical College
Gandhara University
Peshawar

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