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Original article

A study of Ocular Manifestations of Blunt Trauma to the eye in Tertiary care Hospital

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Abstract

In the present study was investigated that the Ocular Manifestations of Blunt Trauma to the eye in Tertiary care Hospital in Kanchipuram. Blunt injury to the eye results in a spectrum of damages to the intraocular structures and the adnexa. This is a prospective observational study. Totally 50 number of patients were included and males were more frequently involved than females. It has been observed that, the anterior segment was most commonly involved. Sub conjunctional hemorrhage of various grades was the most common clinical finding 37 cases out of 50. There 2 cases of corneal edema, 2 cases of hyphema and 1 case of iridodialysis associated with angle recession. Many of the injuries could have been prevented if the patients had used protective eye wear during work or play. Our patients have been advised to wear protective glasses in work spot which expose them to ocular injury and during sports.

Key words: *Blunt Injury, Corneal edema, Eyes*

I. Introduction

Ocular injury is a major health problem in India, and blunt trauma is one of the important causes for morbidity and blindness. The eye is so precious organ of the body that almost all the work of the body requires the functional integrity of eye[1]. So it has been given at most importance Children at play, young men at work in factories and construction sites, automobile accidents, sports injuries and in rural areas, agricultural based injuries are the causes of blunt ocular injuries. For many years several common ophthalmic diseases, such as glaucoma, macular degenerations, cataract have been widely recognized as major cause of visual disability and because of their prevalence, these disorders have received a major share of research and funding. More recently visual loss due to injury has been appreciated as a significant public health issue. The injury to the eye, if not treated promptly, may lead to blindness or decreased vision. Looking at the present scenario of working pattern and visual demands of the patients, and the use of sophisticated instruments, it has become mandatory on the part of an ophthalmologist to identify the various ocular damage due to blunt trauma, which may vary in severity from a simple corneal abrasion to an extensive rupture globe, and provide satisfactory vision at its earliest possible time[2].

Though the eye is protected from direct injury by the eyelids and projecting margins of the orbit, ocular injuries are much more common[3]. The injuries are more common when safety measures are not adopted. Negligence, ignorance, poverty, non availability of services, false beliefs and local treatments play a role in the prognosis of injuries of eye. Keeping all these in the mind, this study was undertaken to evaluate the prevalence, etiology, causative agents, clinical features, complications, management, visual outcome, and general prognosis of Ocular blunt trauma.

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II. Materials and Methods

Patients presenting with history of blunt trauma to one or both eyes were selected from the outpatient clinic of the ophthalmic department, Meenakshi medical College Hospital and Research Institute, Kanchipuram. Includes in this study are 50 patients, examined from august 2022 to August 2024. This present study was approved from institutional ethical committee. All the patients were informed concern. Each patient was examined. Patients were selected based on the including criteria. Old and fresh injuries cases were included in this study to know the long term effects and complications of blunt trauma. When a patient presented with a history of blunt injury, a detailed history with age, sex, sign and symptoms occurred following the injury were taken. A detailed torch light examination was performed and confirmed with slit lamp. Vision was recorded on snellen chart. Intraocular pressure was recorded with the goldman applanation tonometer. Ophthamoscopy (Direct/Indirect) was performed in all cases. Gonioscopy was performed in all patients, except those with sub-conjunctional hemorrhage and children. Retinoscopy was performed in possible patients. Plain X- ray orbit was taken whenever necessary, and in all medico-legal cases. B-scan ultrasonography was performed in patients with posterior segment problem. Patients with only sub – conjunctival hemorrhages were called for follow up once in 4 days. Patients who were discharged from the ward were reviewed after 10 days and then, as and when required.

III. Results

Age wise distribution of patients

Table 1 indicates that the age wise distribution of eye injury patients. Total 50 patients were included in this study. A majority of patients were eye injured in the age of 26 to 35years followed by birth to 15years of age children's were affected by eye injury.

Table -1 : Age wise distribution of patients

Age group(years)	Present study	Percentage %
Birth-15	9	18
16-25	6	12
26-35	16	32
36-45	3	6
46-55	8	16
Above	8	16

Sex wise distribution of patients

Table 2 revealed that the sex wise distribution of patients. Male patients were significantly affected by eye injury compared with female patients.

Table -2: Sex wise distribution of patients

Sex	No.of cases	Percentage
Male	35	70
Female	15	30
Total	**50**	**100**

Distribution of cases according to source of injury

Table 3 represents that distribution of patients according to source of injury. Most of the patients affected by Occupational injuries (48%) compared with others like play and sports, Assauld and road traffic accident and others 20%,18% and 14% respectively.

Table-3 Distribution of cases according to source of injury

Source of injury	No.of cases	percentage
Occupational injuries	24	48
Play and sports	10	20
Assault and road traffic accident	9	18
Others	7	14
Total	**50**	**100**

Distribution of cases according to time interval for consultation

Table.4 indicated that the distribution of cases according to time of interval for consultation injuries. According to time of interval most of the patients were injured in 1-5 days compared with more than 5 days and more than 12 months.

Table-4: Distribution of cases according to time interval for consultation following injury

Time interval	No.of cases	Percentage
Less than 24 hours	12	24
1-5 days	27	54
5days-1 months	9	18
1-12 month	1	2
More than 12 months	1	2
Total	**50**	**100**

Segment of Eye

Table 5 represents that the distribution of cases according to segment of the eye involved. In the present study most of the patients purely anterior segment were involved compared to other segments involved like purely posterior, both anterior and posterior eye infected patients.

Table-5: Distribution of cases according to segment of the eye involved

Segment involved	No.of cases	percentage
Purely anterior	46	92
Purely posterior	1	2
Both anterior and posterior	3	6
Total	**50**	**100**

Conjunctival findings

Table 6 indicates that distribution of cases according to conjunctival findings. Totally 50 patients were studied. 37 patients were purely sub-conjunctival hemorrhage findings were identified remaining 5 and 8 patients were affected with sub-conjunctival hemorrhage and sub – conjuctival hemorrhage associated with other ocular findings respectively.

Table-6: Distribution of cases according to conjunctival findings

Conjunctival	No.of cases
Purely sub – conjunctival hemorrhage	37
With sub- conjunctival hemorrhage	5
Sub –conjunctival hemorrhage associated with other ocular findings	8
Total	**50**

Corneal Findings

After excluding 37 cases of pure sub conjunctional hemorrhage out of 50 cases, in the remaing 13 cases, 4 had corneal findings, 1 with had corneal abrasion, 2 had corneal edema with hyphema with raised IOL and 1 had partial laceration. Case of corneal abrasion healed in one day. **(Table-7)**

Table-7: Distribution of cases according to corneal findings

corneal findings	No.of cases
Corneal abrasion	1
Corneal edema	2
Partial laceration of cornea	1

Hyphema

Hyphema of various degrees have been described by many as a frequent clinical finding, but in this study only 2 cases of hyphema were present. Involving 1/3 to ½ the anterior chamber with marginal increase in the intraocular pressure. All the 2 cases of hyphema were associated with variable degree of angle recession.

Table-8: Comparison of the grade of hyphema with grade of angle recession

Case No	Primary hyphema	Angle recession (Degress)
1	25-50%	90-180
14	25%	<90

Iris & Involvement

Involvement of the iris and pupil constituted major number of clinical findings. Traumatic mydriasis was present in 6 eyes, which was the most commonest, followed by sphincter tears in 1 eye, traumatic miosis in 1 eye, iris atrophy in 1 eye and iridodialysis in 1 eye.

Table-9: Showing pattern of iris & Involvement

Findings	No. of cases	Percentage
Iris atophy	1	12.5%
Iridodialysis	1	12.5%
Sphincter tears	1	12.5%
Traumatic mydriasis	6	75%
Traumatic miosis	1	12.5%
Total	**10**	**100**

lenticular involvement

In one case there was dislocation of lens in the anterior chamber, which was clear (Case No. 14). There were 7 cases of subluxation, out of which 3 had total lenticular opacities and 4 had partial lenticular opacities. One eye had Rosette cataract. (Table 10).

Table-10: Showing patteren of lenticular involvement

Lenticular involvement	**No. of cases**
Subluxation of lens with and without lenticular opacity	7
Dislocation of lens	1
Pure lenticular opacity (Rosette cataract)	1
Total	**9**

Posterior segment damage

There were 4 cases with posterior segment involvement. Of these, 1 case had pure posterior segment involvement. 2 cases of Berlin's edema (18.2%) were observed in this study. Both cleared within 2-5 days. A total of 4 cases with macular edema were observed. The vision returned to normal in all cases as the edema subsided over a period of 1-2 months. Choroidal hemorrhage was observed in one case. The hemorrhage was dark-red with well demarcated edges. The hemorrhage absorbed gradually, exposing the underlying choroidal rupture which caused it. **(Table 12)**

Table -11:Distribution of cases as per the clinical findings of posterior segment damage

Clinical findings	**No.of cases**
Vitreous herniation into anterior chamber	1
Vitreous hemorrhage	2
Berlin" edema	2
Retinal detachment	2
Macular edema	4
Macular hole	1
Choroidal rupture with hemorrhage	1

IV. Discussion

50 patients presenting with history of blunt injury to one or both eyes were selected from the outpatient of the Ophthalmic Department, Meenakshi Medical College Hospital and Research Institute, Kanchipuram. In this study, the age limit ranges from 8 months old child to 75 years old man. Children below 15 years were 8 in number. The maximum number of patients was observed between the age group of 26-35 years. They were 16 in number. Our finding correlated with the study carried out by Zagelbaum BM[4]. There were a total of 35 males and 15 females. The male: female ratio was 2.3:1. In the study conducted by Zagelbaum BM[4], the male: female ratio was 6.5:1. There has always been a significant male preponderance. This is due to the fact that, the males lead a relatively more active and outdoor life as compared to females. As compared to Zagelbaum BM[4] sex incidence our study shows a slight relative increase in female preponderance to trauma, as females are also now leading an active lie.

Of the 50 patients examined, 12 patients were examined within the first 24 hours following injury. Some patients had received medical treatment prior to consultation at our hospital and a few had used indigenous medicines at home. Patients who came after a long period following injury usually did not suffer from significant symptoms and signs at the time of injury, or had received treatment elsewhere at that time, and were presenting now with sequelae or complications.

Few patients with assault or road traffic accidents had minor injuries elsewhere on the body. It has been observed that, the damage to the anterior segment of the eye was more common that the posterior segment. 46 cases presented

with pure anterior segment findings. One had purely posterior segment findings and rest 3 cases had both anterior and posterior segment involvement.

It was the most common clinical finding. Of the total number of 50 cases 37 had pure subconjunctival haemorrhage, 8 had subconjunctival haemorrhage associated with other clinical findings. Rest 5 cases did not have sub-conjunctival hemorrhage, but had other clinical findings. The subconjunctival hermorrhages were not graded as described by Prakash DN [5], because of the varying injury - consultation interval. Sub-conjunctival hemorrhages varied from small petechiae to large extravasations. Their anterior margin being denser and the haemorrhage tapering posterioriy, except in severe sub-conjunctival haemorrhages were the posterior limit could not initially be made out. The sub-conjunctival hemorrhages absorbed completely in all case and absorption occurred over a period of 15-21 days. There were 3 cases with conjunctival lacerations, none of them were more than 5 mm in length.

After excluding 37 cases of pure sub-conjunctival hemorrhage out of 50 cases, in the remaining 13 cases, 4 had corneal findings, 1 with had corneal abrasion, 2 had corneal edema with hyphema with raised IOL and 1 had partial laceration. Case of corneal abrasion healed in one day. There was one patient with a partial thickness corneal tear, in the superotemporal area near the limbus extending for 2-3 mm.

Hyphema of various degrees have been described by many as a frequent clinical finding, but in this study only 2 cases of hyphema were present. Involving 1/3 to ½ the anterior chamber with marginal increase in the intraocular pressure. All the 2 cases of hyphema were associated with variable degree of angle recession.

Our findings correspond with the findings of other studies, which states that angie recession is almost invariably present with a macroscopic hyphema[4] In this study, 6(75%) out of 8 eyes had angle recession. Canavan and Archer" noted 80.5% of angle recession. Blanton noted a 71% incidence of angle recession following blunt trauma.

In most of the eyes with angle recession, intracular pressure was within normal limit. Few of the eyes, had a low tension in the early post-traumatic period, but returned to normal later. Despite the presence of angle recession, the simultaneous association of a rise in the intraocular pressure was not seen in this study. This finding corresponds to the study conducted by Cillino S[6] and Vats S[7].

Involvement of the iris and pupil constituted major number of clinical findings. Traumatic mydriasis was present in 6 eyes, which was the most commonest, followed by sphincter tears in 1 eye, traumatic miosis in 1 eye, iris atrophy in 1 eye and iridodialysis in 1 eye. Our study corresponds to the study of 205 cases by Cillino S[6] and Vats S[7]in which 79 cases had iris and pupillary injuries. 9 eyes had lenticular involvement in the form of subluxation, dislocation and lenticulr opacities with or without rupture of the anterior capsule, as opposed to 52 eyes out of 212 in a study of Cillino S[6] and Vats S[7]. In one case there was dislocation of lens in the anterior chamber, which was clear. There were 7 cases of subluxation, out of which 3 had total lenticular opacities and 4 had partial lenticular opacities. One eye had Rosette cataract.

There were 4 cases with posterior segment involvement. Of these, 1 case had pure posterior segment involvement. There was one case of vitreous herniation into the anterior chamber. The anterior face as intact. Two eyes in this study had vitreous hemorrhage. The cause of vitreous hemorrhage in the 2 cases was a tear in the ciliary body. There was 2 case of rhegmatogenous retinal detachment, which could be appreciated on indirect ophthalmoscopy and was confirmed by ultrasonography. One case had defective appreciation of projection of rays in the infero-temporal quadrant. 1 case had NOPL.The patient was referred to higher center for further management.

2 cases of Berlin's edema (18.2%) were observed in this study. Both cleared within 2-5 days. Siegried found that in 167 cases, 12.5% had Maiya AS[8]. Herrman found 17 cases of Berlin's edema in 677 cases[8]

The first case of a macular hole was described by Karve[9] and Shukula[10.] 9% of macular holes was attributed to trauma. We observed only one case of macular hole, in a old case of blunt injury. He had a central scotoma with parafoveal fixation. Choroidal hemorrhage was observed in one case. The hemorrhage was dark-red with well demarcated edges. The hemorrhage absorbed gradually, exposing the underlying choroidal rupture which caused it.

Out of 50 cases, 37 eyes with pure sub-conjunctival hemorrhage had a best corrected visual acuity of 6/6. 5 eyes had a final visual acuity of 6/60 to 6/12, 8 eyes had a final visual acuity of less than 6/60. All cases with subluxation without dense lenticular opacities showed an error towards myopia. There was no significant change in other cases.

In most of the cases in this study, patients who consulted us within the first few days of injury showed a lower intraocular pressure as compared to the non - traumatized eye. Only in a few of these cases, the non-traumatized eye also showed a lower intraocular pressure simultaneously. In cases of traumatic hyphema, there was marginal increase in intraocular pressure but returned to normal soon. There was no significant rise in intracular pressure in cases with angle recession. One eye showed hypotony which was due to retinal detachment. This is consistent with the study conducted by Cillino S[6] and Vats S[7].

V. Conclusion

Blunt injury to the eyes results in a spectrum of damages to the intraocular structures and adnexa. In the present study we conclude that many of the injuries could have been prevented if the patients had used protective eye wear during work or play. Our patients have been advised to wear protective glasses in work spot which expose them to ocular injury and during sports.

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