

Original Research Article

Clinical profile of paediatric patients presenting with ocular trauma to tertiary care centre**Dr. Mohod Smita¹, DR. Ambedkar Sanjeevani², Dr. Matey Prajakta³**¹DNB Ophthalmology, Assistant Professor in the Dept of ophthalmology, B.J.G.M.C. & SGH, Pune²MS Ophthalmology, Head of the department in the Dept of ophthalmology, B.J.G.M.C. & SGH, Pune³Resident in the Dept of ophthalmology, B.J.G.M.C. & SGH, Pune***Corresponding author**

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Abstract: The purpose of this study was to analyse the clinical profile of the paediatric patients (age < 15yrs) presenting with ocular trauma to tertiary care hospital. Materials and Methods: Retrospective review of records of past 2 yrs (2014-2016). The cases were grouped according to The System of Ocular Trauma Classification Group classification system. Demographic details like age and sex, activity at time of injury, identifiable objects causing injury, presence or absence of supervision during injury were noted with follow-up period of 30 days from the medical records. In our study, total 64 patients with 86 eyes were included. The age-group more affected was between age group of 6-10 yrs (56% i.e 35pts). Boys (62%) were affected more than girls (38%). Adnexal injuries found in 20% (17eyes), whereas closed and open globe injuries in 62% open (54 eyes) and 18 % close (15eyes) respectively. The most common type of open globe injury was (type B), zone (II), pupil (B) & grade (D). The most common type of close globe injury was(type A), zone (I), pupil (B) & grade (A).Most of children reported to casualty within 24 hours 90% (78 eyes) remaining after 24 hours 10% .The objects causing injury were sharp objects(18%),blunt objects(8%), household objects(14%). The other causes of injury were sports (20%), accidental fall (22%), chemical and road traffic accidents (RTA) were (5% each),burn (3%), animal bite (4%) The final visual acuity(VA) in 69% eyes were better than 20/40,(31%) eyes had VA of 20/50 to 20/100 and poor visual outcome in remaining eyes .Most of the ocular injuries occurred at home(60%), at playground(22%), accidental fall(18%) and others. The most common age group affected was 6-10 years. The most common type of injury in Close Globe injury was contusion and Open globe injury was penetrating injury. Boys were affected more than girls. The time of reporting to casualty was within 24 hours. Sharp objects, blunt objects, and household objects were common objects of injury. The places of injury were home, playground, and others. Most of the children achieved best corrected visual acuity more than 6/18. Visual outcomes with blunt ocular trauma were better than penetrating injuries. Most of visual losses in injuries are preventable by increasing awareness regarding availability of nearby health care centres, hazards of firecrackers, providing safety environment to children in home, in schools & on playgrounds and necessity of earliest approach to health care centre. All these will be definitely helpful to reduce the social & economic burden of society & psychological complexes in children. And every ocular casualty should be dealt seriously.

Keywords: Ocular trauma, open and closed globe injuries, paediatric age-group**INTRODUCTION:**

Ocular injuries are the most common cause of acquired unilocular blindness in children. Eye injuries account for 8-14% of total injuries in children [1, 2]. Next to amblyopia, ocular injuries are the main reason for preventable monocular visual loss in child hood [3]. Paediatric ocular injuries are distinct from those in adults in many ways. Etiologically, such injuries are largely accidental, as opposed to those caused by

intentional violent assault in adults Children below 3 years age-group mostly suffer from handler-related injuries like from fingernails of parents, caretakers, or siblings [4]. While older children have injuries due to sharp objects, toys, tree branches, pencils, sports, stones [5]. Male children are affected more than females due to their adventurous and aggressive nature.5A marked preponderance of injuries is seen in the 6–10 years age group [6]. Children in this age group are relatively

immature and exposed to varying surroundings making them more vulnerable to injuries.

Even small trauma to an eye may lead to permanent visual impairment creating significant impact on future quality of life. Thus, patient and social education regarding eye injuries and its early specialized treatment can give good visual prognosis [7] hence, present study has been planned to analyze the pattern and outcome of paediatric injuries in Tertiary care hospital.



Fig 1: 15 day old child with assault



Fig 2: Same child in fig1.after plastic sx repair



Fig 4: Child with subconjunctival haemorrhage



Fig 3: Child with lower lid burn



Fig 5: Limbal tear with iris prolapse

MATERIAL AND METHODS:

Retrospective data from hospital record register of the B.J.G.M.C. Tertiary care centre from July 2014 to June 2016 were collected. Details of patient including MRD no, name, address, detail history (modes of injury, duration, nature of injuring object, etc.), ocular examination findings & their status on 30th day follow up were noted & analysed. The cases were grouped according to the Ocular Trauma Classification Group classification system based on the Birmingham eye trauma terminology [8].

Inclusion criterion: All paediatric patients with age-group up to 15 years of either sex having history of ocular trauma were included in study.

Exclusion criteria: Patients with history of previous established eye diseases like glaucoma, congenital anomalies, other non-traumatic causes and age above 15 years were excluded from study.

RESULTS:

In our study, total 64 patients with 86 eyes were included. On analysing the data it was observed that 20% (13 pts) injuries were found in age group of 0-5yrs, 56%(35pts) in the age group of 6-10 yrs & 24% (16pts) in 11-15 yrs of age. Boys (62% - 40pts) were affected more than girls (38% - 24pts). Most of children reported to casualty within 24 hours 90% (78 eyes)

remaining after 24 hours 10% (8 eyes).The objects causing injury were sharp objects (18% -12. pts), blunt objects (8% -6 pts), household objects (14% -7pts). The other causes of injury were sports (20% -13pts), accidental fall, (22% -14 pts), chemical and road traffic accidents (RTA) were (5% each – 3 pts each), burn (3% -2 pts), animal bite (4% - 3 pts) and assault (1%- 1pts). Adnexal injuries found in 20% (17eyes), whereas closed and open globe injuries in 62% open (54 eyes) and 18 % close (15eyes) respectively.

When the cases were grouped according to the Ocular Trauma Classification Group classification system based on the Birmingham eye trauma terminology it was found that the most common type of open globe injury was (type B), zone (II), pupil (B) & grade(D). The most common type of close globe injury was (type A), zone (I), pupil (B) & grade (A). Among 17 eyes of adnexal injury 5 eyes had eye lid contusion, 7 eyes had lid partial or full thickness tear, remaining 5 had lid abrasions.

Out of 15 close globe injuries, 8 eyes (53%) had contusion (type 1), 5 eyes (33%) had lamellar laceration (type2), 1 eye (7%) had superficial foreign body over cornea (type 3) & 1 (7%) had mixed (type4). In 2 (14%)eyes relative afferent pupillary defect was present(A) & pupil were normally reacting to light (B) in 13 eyes(86%.) Injuries in 8 eyes (53%) were limited

to bulbar conjunctiva, cornea & sclera (zone 1). In 5 eyes (33%) anterior segment was involved (zone 2) in the form of hyphema, anterior capsular tear &traumatic cataract & 2 eyes were presented with retinal detachment & vitreous haemorrhage, i.e involving posterior segment (zone 3). On follow up after 30 days 9 eyes (60%) attended visual acuity $\geq 20/40$ (Grade A), 2(13%) eyes had between 20/50-20/100(Grade B), 1 eye (7 %) had between 19/100-5/200(Grade C), 2 eyes had between 4/200-light perception(Grade D) & 1 eye(7%) had no perception of light(Grade E).

Among 54 eyes having open globe injuries , 15 eyes(28%) had globe rupture(type A) , 24 eyes 5 eyes (9%) had visual acuity $> 20/40$ (Grade A), 10 eyes (19%) eyes had between 20/50-20/100(Grade B), 7 eyes (13%) had between 19/100-5/200 (Grade C), 24 (43%) had penetrating injury (type B), 10 eyes (19%) had intraocular foreign body(type C) & 5 eyes(10%) had combination of above(type D). Injuries in 20 eyes(37%) were involving Zone I i.e. cornea and limbus, eyes (52%)in zone II i.e. limbus to 5 mm posterior into the sclera , and 6 eyes (11%)were involving Zone III i.e. posterior to 5 mm from the limbus in the form of sclera tear.18 eyes (33%) had Relative afferent pupillary defect (A) & remaining 67 % had normal reacting pupil(B). On 30th day follow up eyes(44%) had between 4/200 -light perception(Grade D) & 8 eyes(15%)had no perception of light (Grade E).

Table 1: Age & gender wise distribution

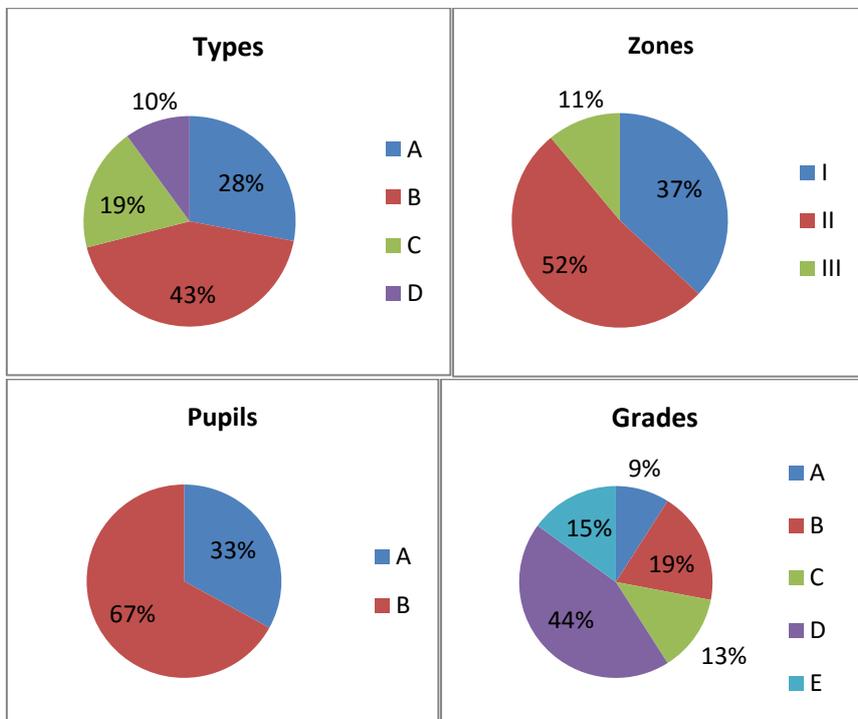
Age group	Boys (%)	Girls (%)	Total (%)
0-5 yrs	9	4	13(20%)
6-10yrs	22	13	35(56%)
11-15yrs	9	7	16(24%)
Total	40(62%)	24(38%)	64(100%)

Table 2: Age wise cause of injury

Cause/Age →	0-5 yrs	6-10 yrs	11-15 yrs	Total (%)
Sharp object	2	7	3	12(18%)
Blunt object	2	3	1	6(8%)
House hold objects	1	4	2	7(14%)
Sports	3	7	3	13(20%)
RTA	0	2	1	3(5%)
Accidental fall	3	8	3	14(22%)
Animal bite	0	2	1	3(4%)
Assault	1	0	0	1(1%)
Burn	1	0	2	2(3%)
Chemicals	0	2	1	3(5%)
Total	13(20%)	35(56%)	16(24%)	64(100%)

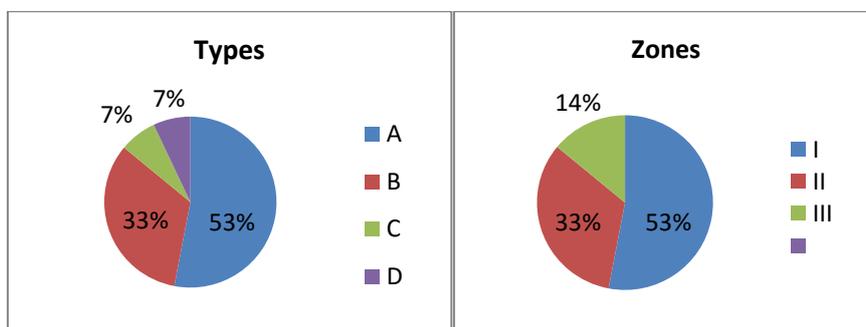
Table 3: Duration of visiting casualty

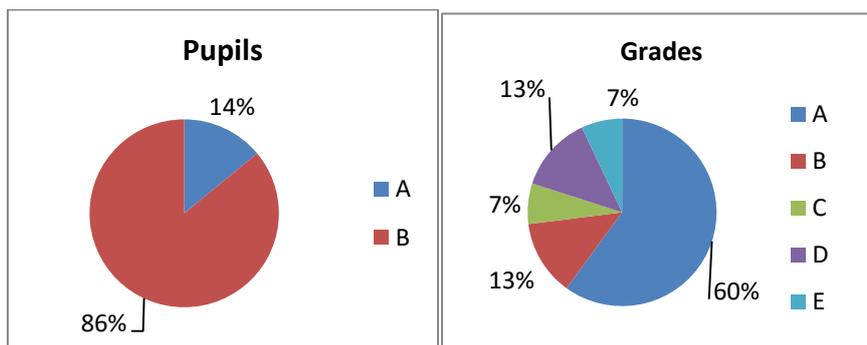
Duration	No of eyes	%
0-24hrs	78	90
1-7 days	8	10



Clinical profile of open globe injuries according to the Ocular Trauma Classification Group classification. Type A = rupture, Type B = penetrating, Type C = intraocular foreign body, Type D = perforation, and Type E = mixed. Zone I = cornea and limbus, Zone II = limbus to 5 mm posterior into the sclera, and Zone III = posterior to 5 mm from the limbus. Pupil A = positive relative

afferent pupillary defect in the injured eye and Pupil B = no relative afferent pupillary defect in the injured eye. Grading was done according to visual acuity: Grade A ($\geq 20/40$), Grade B (20/50–20/100), Grade C (19/100–5/200), Grade D (4/200 to light perception), and Grade E or no light perception





Clinical profile of closed globe injuries according to the Ocular Trauma Classification Group classification. Type A = contusion, Type B = lamellar laceration, C = superficial foreign body, Type D = mixed. Zone I = limited to the bulbar conjunctiva, sclera, and cornea, Zone II = anterior segment (includes structures of the anterior segment and the pars plicata), Zone III = posterior segment (all internal structures posterior to the posterior lens capsule). Pupil A = positive relative afferent pupillary defect in the injured eye and Pupil B = no relative afferent pupillary defect in the injured eye. Grading was done according to visual acuity: Grade A ($\geq 20/40$), Grade B (20/50–20/100), Grade C (19/100–5/200), Grade D (4/200 to light perception), and Grade E or no light perception

DISCUSSION:

In our study, as per age-specific pattern of ocular injuries, more prevalence is found in age-group 5 years and above than below 5 years which is similar to other studies like MacEwen where it was 84% of ocular injuries in 5-14 years age-group [6, 9, 10]. School-age children are more susceptible than younger age-groups, because of their independent and adventurous spirit involving them in many unsupervised games, making them vulnerable to trauma. Younger age-group children are most of the time under parental supervision and physically less active than older children. So, younger age-groups are more susceptible to handler-related injuries like fingernails of siblings, mother, or caretakers [4, 10]. Boys tend to affect more commonly than the girls [5, 7, 10]. This shows more adventurous and aggressive behavior of boys for getting severe ocular trauma. Ocular injuries more commonly occurred at home, followed by playground which is very much similar to MacEwen C (51%) and Desai T *et al.*; (45.62%) [5,7]. Home is the common place of injuries both for preschool and school-going children which reflects the amount of time spend at home. Most of the younger age-groups were injured by domestic utensils or toys. Early treatment is the key factor for good visual

outcome and in our study 90% eyes reported within 24 hour and 10% eyes between 1-7th days, only which is contradictory with few studies like in Desai T *et al.*; where around 70% presented after 24 hours. Malik R *et al.*, found 47.50% visit within 24 hours and 30.50% in more than 48 hours [7, 8, 11]. It shows changing pattern in our rural set-up due to improved infrastructure like transport, availability of specialized hospitals in remote area, and increasing awareness in parents and society. Those visited late were due to unawareness, poor parenthood, carelessness, poverty, extremely remote area, and fear factor in children. Those visited within 24 hours had good visual prognosis than others.

The causes of injuries are varies in different geographical areas and age-group. In our study, projectile objects causes more number of eye injuries, followed by accidental fall & sports which are more common in older age-groups (5-15 years). Accidental fall injuries are the most common in of ocular trauma in younger age-group (0->5 years) where the actual activity at time of injuries and mechanism of injuries were not well-known. Other causes of injuries are blunt objects, household objects, road traffic accidents, chemical injuries, burn trauma, animal bite, and assault. Like in sports injuries, cricket ball and bat injuries (10%) are more common nowadays than gilli-danda and bow-arrow injuries.

In our study, closed-globe and adnexal injuries had different incidences 18% and 20%, respectively which are near similar to other studies like Desai T *et al.*; where incidence of closed globe injuries was 27% and adnexal injuries (32%). The 7 eyes of adnexal injuries associated with other ocular trauma in which 2 eyes with lid abrasions had corneal epithelial defect, 3 chronic lacerated wound (CLW) with corneo-scleral tear, and 2 eyes with hematoma had hyphema.

In our study, incidences of open-globe injuries (62%) were higher. Its incidence varies in different

studies in different countries [7, 9]. All open-globe injuries were treated with preservation of normal anatomical structure but had poor visual prognosis. Out of 15 close globe injuries, 8 eyes had contusion, 5 eyes (33%) had lamellar laceration which was treated with bandage contact lens insertion, antibiotic eye drops & adequate lubrication. 1 eye had superficial foreign body over cornea which was removed under guidance of slit lamp and advised antibiotic eye drops & adequate lubrication & 2 Patients with traumatic optic neuritis were treated with injectable steroids followed by tapering with oral steroids. Among them one who received it within 8hrs responded to treatment but second one who received after 3 day didn't improve. In 5 eyes anterior segment was involved in which 2 had hyphema who were given anterior chamber wash, 1 anterior capsular tear & traumatic cataract & 2 eyes were presented with only traumatic cataract, those were treated with cataract extraction with secondary IOL placement in one And second left Aphakic and advised secondary iris supported lens placement after 2 months.

On 30th day of follow-up, the final visual acuity (VA) in 69% eyes were better than 20/40, 31% eyes had VA of 20/50 to 20/100 and poor visual outcome in remaining eyes. VA of 8 eyes could not be taken as they were less than 1 year age-group and uncooperative & were following light Visual outcome were hampered due to severe ocular injuries, delay in seeking medical help, and poor compliance of patient. Post-treatment development of corneal opacity and disturbance in normal anatomical structure with poor visual acuity affects quality of life, in form of disfigurement, amblyopia, and use of low visual aids.

CONCLUSION:

According to our study, most of eye injuries occurred in age group 5 years and above, mostly in unsupervised conditions which can be easily preventable. Due to trauma few patients remain blind which affects patient's quality of life. In our study, most of patients visited within 24 hours had good VA showing early seeking of treatment and good supervision is helpful in better outcome of visual acuity. Boys affected more than girls. Projectile objects, blunt objects, and household objects were common causes of injuries. The places of injuries were home, playground, and others.

Most of visual losses in injuries are preventable by increasing awareness regarding availability of nearby health care centres, hazards of firecrackers, providing safety environment to children in home, in schools & on playgrounds and necessity of

earliest approach to health care centre. All these will be definitely helpful to reduce the social & economic burden of society & psychological complexes in children. And every ocular casualty should be dealt seriously.

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