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Original Articles

Structural changes in ocular trauma and the visual outcome

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Abstract
This is the presentation of one year prospective study on the anatomical structural lesions in ocular traumas with their visual outcome among those cases admitted and treated at Nepal Eye Hospital, Kathmandu. The changing life style of the people and environmental changes around with the changing nature of the causative objects on eye injuries have been observed for causing more serious structural lesions or complications including loss of vision.

Key words Hyphaema, Hypopion, Lensectomy, Vitrectomy, Eneucleation.

Anatomically, the eyeball is well protected within the bony orbital socket, covered anteriorly by the eyelids with eyelashes and posteriorly by the cushion of retro-bulbar pad of fat behind. In spite of all these protections, the eyes are most vulnerable to various external injuries and accidents that occur can damage the tissue or organ itself.. The ocular trauma is the single most important cause of mono-ocular blindness worldwide and the second leading cause for visual impairment and blindness (7.8%) in Nepal (National Blindness Survey, NBS ' 81).[8]

Aims and Objectives
The study was carried out to find out the magnitude of the eye injury problems and the nature of the anatomical structural lesions or morbidity with relation to the visual functional outcome, among those ocular trauma cases admitted at Nepal Eye Hospital during the period of one year.

Materials and Methodology
This prospective study was carried on the eye injury patients, admitted indoor either through the Outpatient Department or Emergency at Nepal Eye Hospital (NEH), Kathmandu, during the period of 1 year (January – December, 1996). However, those patients with minor ocular injury problems attended and treated in the Outpatient or Emergency departments but not admitted indoors, were not included in this study.

A specific history was taken about the incidence, time, place of occurrence, the type of causative objects, occupation of the patient and the visual aquity of the injured eye noted. The systemic clinical examinations along with the anatomical structural lesions involved in the injured eyes were done under the Biomicroscope Slit lamp, Direct or Indirect Ophthalmoscopes, including the Ultrasound in some cases to study the nature and the extent of anatomical structural lesion. Then the details of the treatment procedure in the ward, either medical or surgical in the Operation Theatre, and the visual functional outcome or visual aquity were recorded at the time of discharge from the hospital.
All these data details were filled up in the Special preformed format on 'Ocular Trauma Form' and analyzed. .

Results
The results of the ocular trauma cases admitted at Nepal Eye Hospital, Kathmandu during the period of 1 year). are summarized below. Besides this, the findings and observations made by Malla .B.K, in 1993 [10] and 5yrs. retrospective study in 1982 [7] are presented below for comparative study of the changing trend of ocular traumas.

1year (January – December, 1996)

	No	%
Total No of eye injury cases admitted	128	5.2
Total No of eye injury cases Operated	64	50.0
Management:- Medical	64	50.0
Surgical Operations:-		
Major	60	93.8
Minor	4	6.2

Table No.1: Distribution by Sex

	(%)
Male	71.9
Female	28.1

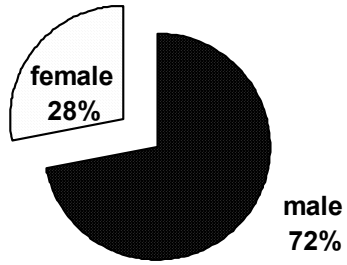


Table No. 2: *Distribution by Age Groups*

Age Groups	*(%)*
<15yrs	29.7
16-45yrs	60.4
>45yrs	9.9

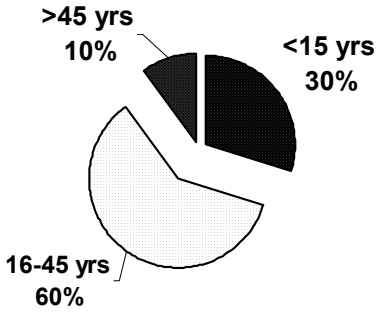


Table No. 3: Trauma status by place

	(%)
Home	44.5
Field	29.7
Factory	9.4
RTA	8.6
School	4.4
Others	3.4

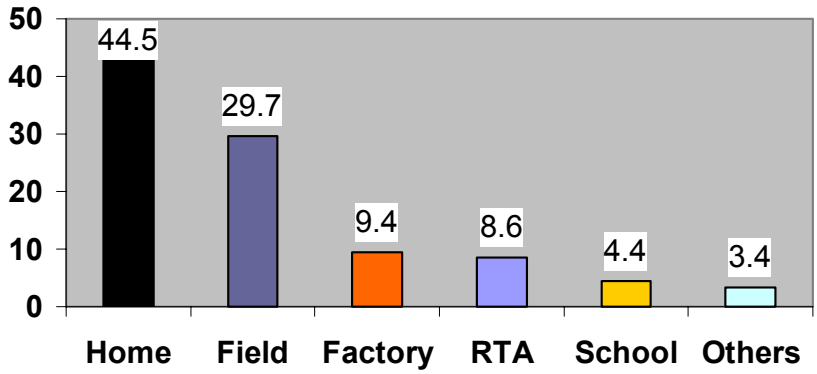


Table No. 4: Distribution by Occupations

	(%)
Student	32.8
Workers	24.2
Farmer	17.2
Housewife	13.3
Others	12.5

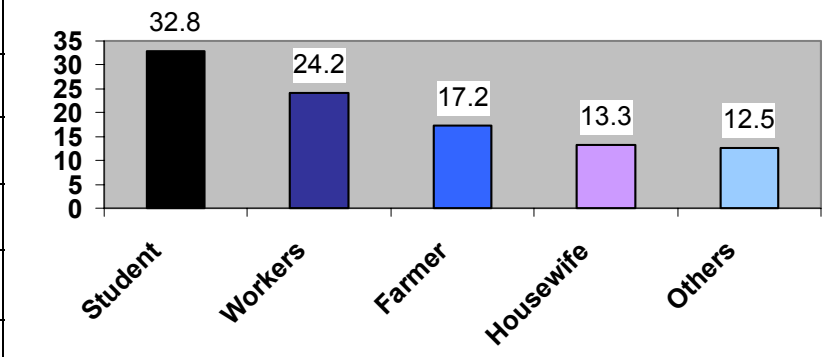


Table No. 5: Causative factors

	(%)
Mechanical	84.3
Agricultural	11.7
Others	4.0

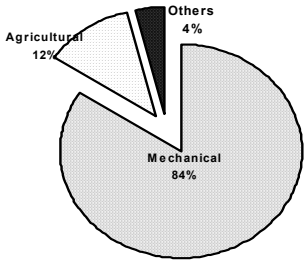


Table No. 6: Nature of lesion

Lesion	%
Corneal	9.3
Conjunctival	22.6
Hyphaema	13.5
Hypopion	7.2
Posterior segment.	31.2
Perforating/ Penetrating	11.1

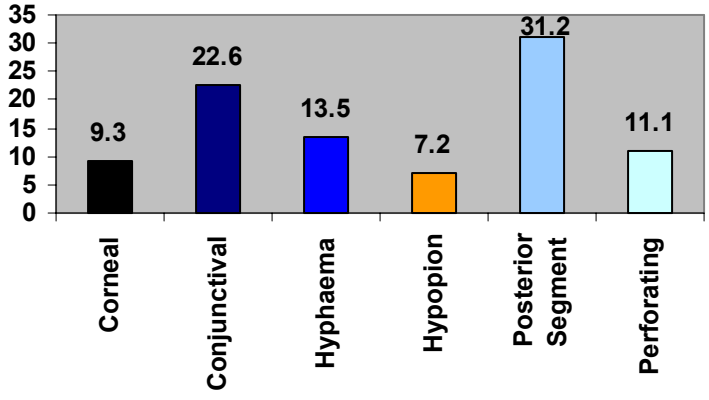
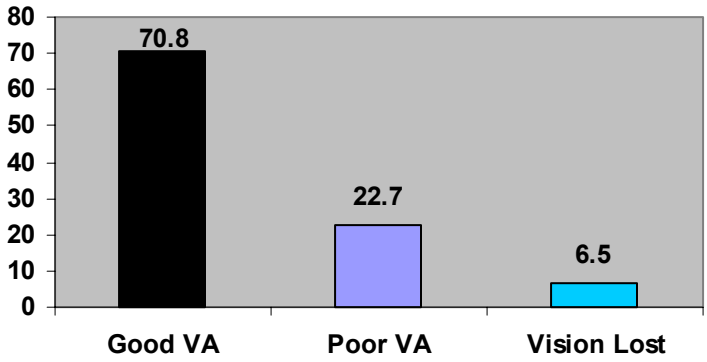


Table No 7: Management

Management	
Medical	64
Surgical	64
Major	46.8
Minor	3.2

Table No. 8: Showing the visual outcome /results

	%
Good VA	70.8
Poor VA	22.7
Vision Lost	6.5



Discussion

Among those trauma cases admitted at Nepal Eye Hospital during the one year study period, the incidence of eye injury was found to be more among male young adults (71.9%) almost 3 times more than female (28.1%). Regarding, the place and occupational vulnerability to eye injuries, it was found that most of the accidents occurring in the vicinity of home environment, and relatively more among the young students (32.8%), farmer (17.2%), labourer (14.1%) and housewives (13.3%). About the principal causative agents for the eye trauma, the mechanical objects like wood or wooden pieces, metallic objects & stone (84.3%). were found to be the most common objects followed by the agricultural agents like paddy, maize (11.7%). Consequently, the extent and the severity of the anatomical structural damages to the eye, were so severe to be admitted as Hyphaema (52.4%) blood in Anterior Chamber or Vitreous. followed by Perforating / Penetrating Corneal or Sclero-corneal injuries the most commonest form of structural lesions (43%.). Similarly corneal laceration or ulcer (20.3%) with or without Hypopion (pus in the anterior chamber) following ocular injuries were the next common condition for admission in the hospital.

Regarding the treatment or management procedure and the visual outcome, almost 50% of among the trauma cases, had proper medical treatment and discharged with relatively good visual recovery. Among those cases with serious structural damages, specially the posterior segment of the eye, had major surgical treatment (46.9%) like structural repair of the perforated or penetrating injuries of the eyeball. Lensectomy with or without IOL, Vitrectomy, Corneal grafting, Retinal detachment showed relatively poor visual outcome. while 6.5 % lost their

vision following Eneucleation / Eviceration operation and Pthysis bulbi.

In this regards, it is worth mentioning about one interesting case of a young adult man who sustained a Corneal rupture with total Hyphaema and prolapsed Iris, following a fist fight with his neighbour. He underwent the primary repair of the ruptured corneal lacerated injury with abscission of the prolapsed iris. Later on he developed dense corneal opacity with adherent leucoma and complicated cataract with organized vitreous haemorrhage He was discharged after regaining the visual aquity of C.F at 2 feet from just P.L.& P.R initially along the advises for regular follow up. Of course, he was declared visually blind on that injured eye and got the compensation amount from the opposite party. Suddenly, the same patient reappeared once again almost after 1 year with a charge of cheating from the other party that he had claimed unethically for the injured blind eye. On examination, it was found that the young man had undergone three (3) major surgical procedures like Corneal graft to replace the dense corneal opacity, Lensectomy with IOL for the complicated cataract and Vitrectomy for the organized vitreous haemorrhage. He regained his visual aquity of 6/ 12 with the best corrected glasses but it was a very hard task to explain to the authority concerned, about the condition of the injured eye at the time of accident and after three major surgical interventions in a year after changing the three most important anatomical refractive components of an eye.

(*The detail of this case is not explained here due to medicolegal problem).*

Trauma incidence by place (%)

Place	*NEH'96*	*NEH'93*	*NBS'81*
Home	44.5	34.2	27.1
Field	29.7	28.2	38.6
Factory	9.4	13.1	
RTA	8.6	4.6	
School	4.4	10.8	24.2
Others	3.4		

Distribution by Occupations (%)

Occupation	NEH'96	NEH'93	Bir.H'82	NBS'81
Student	32.8	25.0	16.6	8.0
Workers	24.2	21.8	13.1	15.9
Farmer	17.2	26.0	37.7	45.3
Housewife	13.3	11.3	11.3	24.6
Others	12.5	15.9	21.9	6.2

Causative Factors (%)

Factors	NEH'96	NEH'93	Bir.H'82	NBS'81
Mechanical	84.3	71.10	31.11	5.8
Agricultural	11.7	15.1	65.2	66.2
Others	4.0	13.9	3.7	28.0

Nature of lesion (%)

Lesions	NEH'96	NEH'93	Bir.H'82
Corneal	9.3	41.9	57.8
Conjunctival	22.6	35.3	19.8
Hyphaema	13.5	3.4	
Hypopion	7.2		14.3
Posterior segment	31.2	9.9	1.4
Perforating/ Penetrating	11.1	2.7	7.7

Management (%)

	NEH'96	NEH'93	Bir.H
Medical	50	47.8	
Surgical	50	52.2	23.3
Major	46.8	5.7	
Minor	3.2	46.5	

Visual outcome (%)	NEH'96	NEH'93	Bir.H
Good VA	70.8	90.3	
Poor VA	22.7	8.2	
Vision Lost	6.5	1.5	23.3

With the change in the life style of people and the environment changes around, the incidence and the causative objects for eye trauma have changed significantly from the agricultural ones like twigs of wheat or paddy to the mechanical ones like bows & arrows, metallic, wooden objects and stones with road accidents., Consequently, the nature and extent of the anatomical or structural lesions in ocular trauma have been more severe with visual loss. Among those severely injured cases with disrupted anatomical structure, the vision were lost due to enucleation or eviceration operation or phthysical changes that occurred on the injured eye.

Conclusion

The young adult group of people with different occupation especially the students are more vulnerable to ocular injuries with the rising trend of mechanical objects. The nature and extent of damage to the anatomical structure of the eye among these ocular trauma patients has been observed more severe with the changing pattern of the causative objects from the agricultural to the mechanical ones. The impact of various media series like Ramayan, Mahabharat and fight fantasies along with increasing road traffic accidents have initiated for more serious ocular structural lesion.

There is no doubt that the qualitative of ophthalmic care service has improved significantly at present as compared to the past, However, it has been observed that the visual improvement cannot be regained on if the posterior segment of the eye specifically the retina is damaged or the anatomical configuration of the eyes are disrupted.

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