Profile of ocular trauma patients attending a tertiary care centre in Assam and its relationship with ocular trauma score

[1]Dr. Chandana Kakati, [2]Dr. Sagarika Das

[1]Assistant Professor, [2]Post graduate trainee
Department of ophthalmology
Gauhati Medical College and Hospital
Guwahati, Assam, India

Original article

Abstract
Introduction – Ocular trauma cases presenting to emergency department are gradually increasing along with rising incidents of road traffic accidents. Most of times treating such cases and explaining prognosis to relatives and patients becomes a challenging situation in these cases as the final outcome in these cases are fairly unpredictable. Ocular trauma score (OTS)described by Kuhn et al [1] is one of most commonly used methods that helps to predict outcome in these cases .In this study we are trying to study socio demographic and clinical profile of patients with ocular trauma and compare OTS score and final visual outcome in these cases.
Study design—Hospital based retrospective non randomized study
Material and methods--- Case records of ocular trauma patients attending outpatient and emergency department are evaluated and analysed. However cases with pre-existing ocular disease or patients treated previously elsewhere, cases lost to follow up are excluded .Cases are evaluated for socio demographic and Clinical profile. Raw score calculation and OTS categorization done for each patient. Treatment received by all patients, any complication, any need for special procedure etc noted .All these cases followed up at least up to 1 year. Final visual outcome of each cases at end of one year noted and compared with OTS of that particular patient in each OTS category.
Result—Total 120 cases are included , male predominant with male female ratio 5: 1.the commonest cause of ocular trauma road traffic accident 63.3 % , followed by physical assault 13.3 % , animal attack 10 % , cracker burn 6.66 % , household injury 6.66 %.According to OTS classification , in OTS 1 there were 8 cases , OTS 2 had 60 cases , OTS 3 had 36 cases , OTS 4 had 8 cases , OTS 5 had 8 cases.
Category wise , final visual acuity improvement was seen as , in OTS 1 , 1000 % cases had no perception of light , in OTS 2 ,46.6 % had at least perception of light / hand movement , in OTS 4 55 .5 % had vision 1/60-5/60 ,in OTS 4 50 % had vision 6/60-6/15 and in OTS 5 100 % had vision ≥ 6/12.
Conclusion—In our study it was observed that higher the raw score and OTS category of the patient, better is the final visual acuity in the patients of ocular trauma .Hence ocular trauma score at time of presentation can give fairly good idea regarding prognosis in these patients and thus system can be can be a very important tool in counselling patients and relatives of patients with ocular trauma.

Keywords: ocular trauma, OTS system

Introduction—
In this era of modernisation ocular trauma cases are gradually increasing in incidence. Road traffic accidents enhanced by alcohol consumption is leading to a number of cases losing vision due to ocular trauma .However treating such cases are very challenging to the treating doctors as final outcome is very unpredictable in these cases. Thus explaining prognosis to these patients and relatives is a very difficult choice for the treating doctors. A number of scoring system have been put forward by doctors worldwide for categorizing these cases .Of these one of the commonly used method is Ocular Trauma Score (OTS) by Kuhn et al. In this study, we are evaluating socio demographic and clinical profile of ocular trauma cases and determining usefulness of OTS system in predicting prognosis in those cases.

Material and methods
This current study is a hospital based non randomised retrospective study done in department of Ophthalmology, Gauhati Medical College, Assam, India. After taking clearance from hospital ethical committee, the records of ocular trauma cases attending outdoor and casualty department from January 2015 to December 2019 are evaluated. However patients with pre-existing ocular disease, patients treated elsewhere previously, infected cases at presentation or patients lost to follow up were excluded from current study. The socio demographic factors like age, sex, whether rural or urban locality, cause of ocular trauma, any history of alcohol consumption at time of trauma etc. recorded for each patients. Clinical profile like visual acuity at time of presentation, nature and type of injury, location and zone of injury etc. are recorded as well. The raw score of each patient calculated individually and according patients are put in OTS category 1 to 5. The patients treatment and outcome are recorded and these are followed up to minimum one year for visual outcome, cosmetic outcome and any complications if any are noted .Visual acuity at end of one year is considered as final visual acuity .The final visual acuity are compared with the OTS scores of these patients at time of presentation to find out their correlation.
Results

All total 120 cases are included in current study , male predominant with male female ratio 5: 1.The commonest cause of ocular trauma road traffic accident 63.3 % , followed by physical assault 13.3 % , animal attack 10 % , cracker burn 6.66 % , household injury 6.66 %.In urban area there are more cases 66.6% where road traffic accident was common while in rural background work related injuries predominated.

Serial number	category		Number of cases	Vision improved	Vision not improved
1	gender	Male	100	56	44
		female	20	12	8
2	Age in years	0-16	12	10	0
		17-39	68	40	28
		40-59	36	16	20
		>60	4	4	0
3	Cause of injury	RTA	76	32	44
		Animal attack	12	8	4
		Physical assault	16	12	4
		Cracker burn	8	8	0
		House hold injury	8	8	0
4	Initial visual acuity	NPL	16	0	16
		PL/HM	72	40	32
		1/60-5/60	16	12	4
		6/60-6/15	8	8	0
		≥ 6/12	8	8	0
5	Type of injury	Closed globe	84	80	4
		Open globe	36	28	8
6	location	Zone 1	72	44	28
		Zone 2	36	16	20
		Zone 3	12	8	4
7	RAPD	yes	12	4	8
		no	108	76	32
8	endophthalmitis	yes	4	0	4
		no	116	68	44
9	Retinal detachment	yes	16	8	8
		no	104	60	44
10	Repair needed	yes	92	44	48
		no	28	24	4

Table 1 socio demographic and clinical profile

In men work related injuries were more and in females domestic injuries were more common. Almost 53.3 % cases were under influence of alcohol at time of injury .There were 70 % closed globe and 30 % open globe injury. At end of one year 56.66 % had improved visual outcome , 83.3 % had acceptable cosmesis , 43.33 % had unchanged / detoriated vision , 43.33 % had post-operative complication , 3.33 % had post-operative infection , 10 % cases needed evisceration / enucleation , and 20 % cases needed plastic surgery.

According to OTS classification , in OTS 1 there were 8 cases , OTS 2 had 60 cases , OTS 3 had 36 cases , OTS 4 had 8 cases , OTS 5 had 8 cases. Category wise , final visual acuity improvement was seen as , in OTS 1 , 100 % cases had no perception of light , in OTS 2 ,46.6 % had at least perception of light / hand movement , in OTS 4 55 .5 % had vision 1/60-5/60 ,in OTS 4 50 % had vision 6/60-6/15 and in OTS 5 , 100 % had vision ≥ 6/12.

Outcome	Number	Percentage
Improved visual outcome	68	56.66 %
Patients having acceptable cosmesis	100	83.33 %
Unchanged / detoriated vision	52	43.33 %
Post-operative complication	52	43.33 %
Post-operative infection	4	3.33 %
Evisceration / enucleation	12	10 %
Plastic surgery needed	24	12 %

Table 2 outcomes

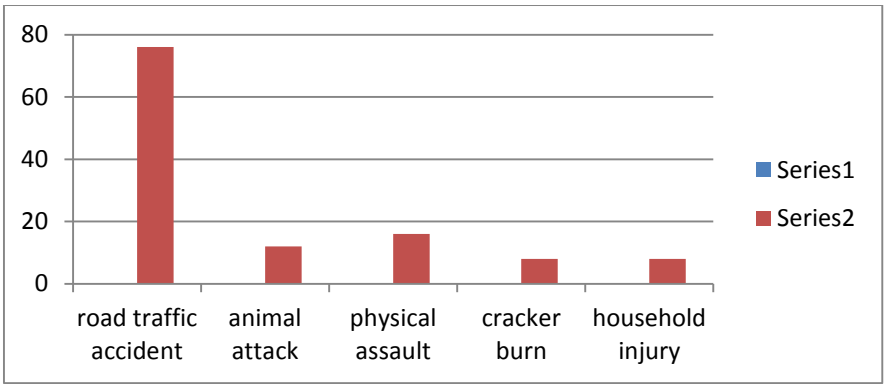


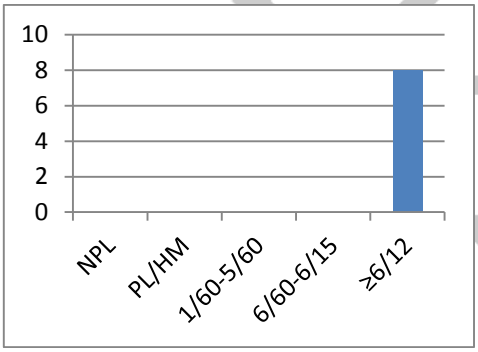
Chart 2 outcomes

Raw score	OTS category	Number	percentage
0-44	1	8	6.66 %
45-65	2	60	50 %
66-80	3	36	30 %
81-91	4	8	6.66%
92-100	5	8	6.66%

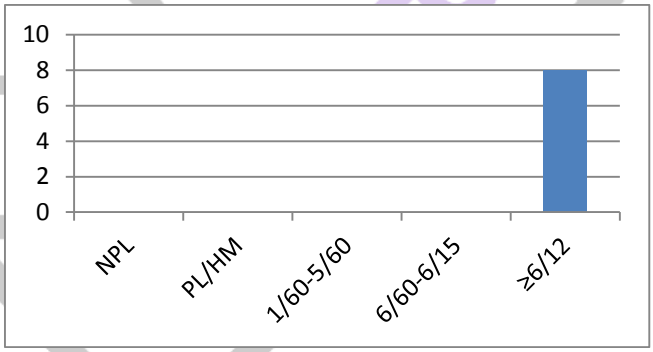
Table 3 --patients number according to OTS category

Achieved vision	OTS 1	OTS 2	OTS 3	OTS 4	OTS 5	Total
NPL	8	8	0	0	0	16
PL/HM	o	28	0	0	0	28
1/60-5/60	0	16	20	0	0	36
6/60-6/15	0	8	16	4	0	28
≥6/12	0	0	0	4	8	12
TOTAL	8	60	36	8	8	120

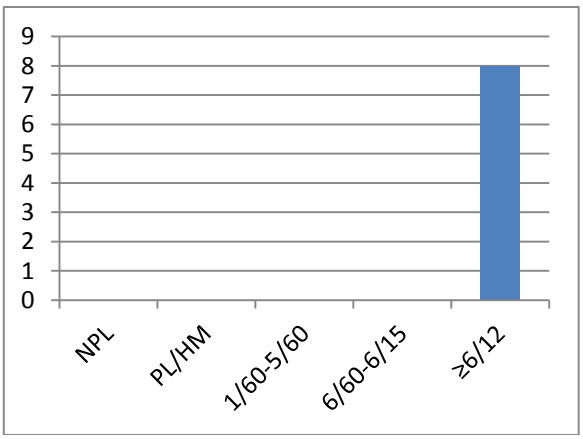
Table 4- achieved vision in relation to OTS category



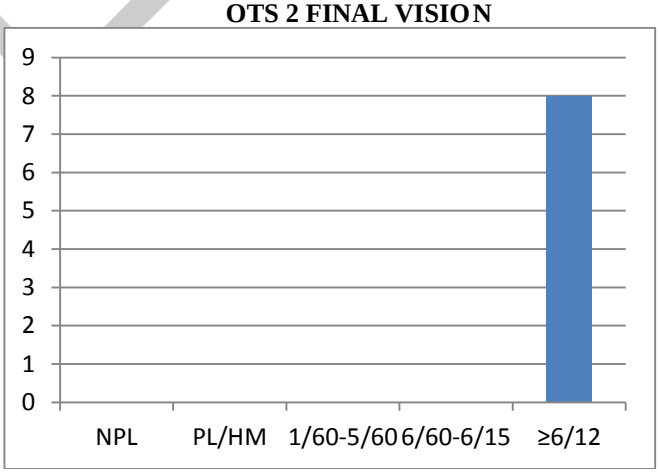
OTS 1 FINAL VISION



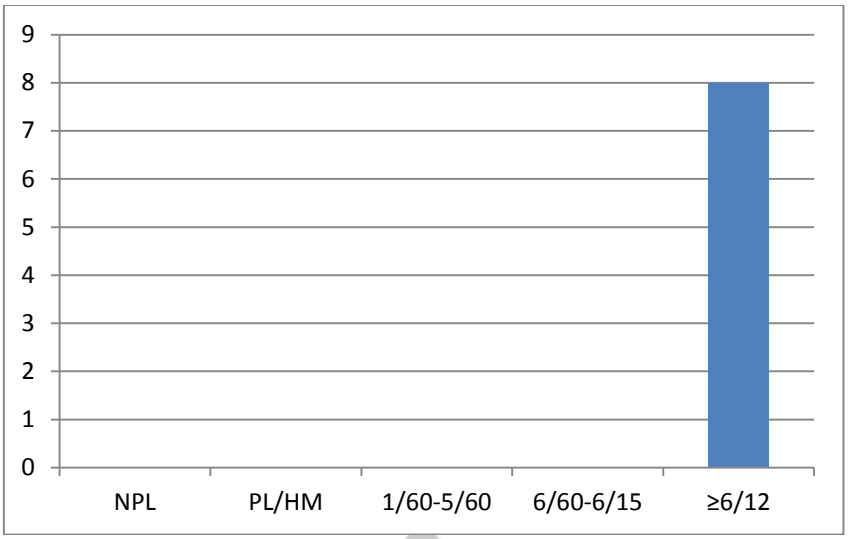
OTS 2 FINAL VISION



0TS 3 FINAL VISION



OTS 4 FINAL VISION



OTS 5 FINAL VISION

Discussion

Ocular trauma have been one of common and major cause of visual impairment in recent era. The most common cause in our study was road traffic accident, alcohol consumption being an important contributing factor. However visual impairment can be preventable with timely intervention with meticulous repair and proper medical management. Proper counselling of patient and family members is very important to make them understand prognosis which can be unpredictable at times.

Our study showed male preponderance in age group of 17-39. This findings are similar to that of Rahman I et al[2] and Loon SC et al[3].

In our study we found that higher the trauma raw score and OTS category, better is the final visual acuity in the patients with ocular trauma .Ours findings are similar to various studies done in patients with ocular trauma.

In the study by Rupesh Agarwal et al [4] on prognostic factor for open globe injuries and correlation of ocular trauma score, poor preoperative visual acuity is significantly associated with post-operative visual acuity .In classification and regression tree model by Schmidt et al [5], they have shown initial vision as a key predictor in open globe outcome prognostic tree and was found to correlate significantly with final outcome.

C Yu Wai Man et al [6] studied the ocular trauma score (OTS) and the classification and regression tree (CART) as prognostic models of visual outcome after open globe injury. They found that both the OTS and CART had high predictive accuracy, but OTS had higher prognostic accuracy and could be used in counselling patients and in management decision making.

Mehul A Shah, MD et al [7]did a study to validate the predictive value of the Ocular trauma score (OTS) in injury cases with traumatic cataracts and found that OTS can be a reliable tool to predict visual outcome in cases of traumatic cataracts 6 week post operatively.

Burak Turgut et al [8] OTS can give information about visual outcome and categorical evaluation of traumatic ocular injury at initial examination .Similar ly , Unver at al [9] found that OTS system can provide reliable prognostic information in ocular trauma patients.

The major limitations of the study is that it is a retrospective study which is based on medical records of patients and many patients were lost to follow up and hence got excluded from the study.

Conclusion

Our study shows that higher the OTS score better is the final visual outocme after treatment .Hence OTS can give us some insight at first presentation regarding the final visual prognosis in thse cases and can be used as a guiding tool while planning treatment and for counselling of patients regarding outcome.

Ethical permission – ethical committee clearance taken from institutional ethical committee

Financial disclosure—authors have no financial interest in this presentation

References

1.Ference Kuhn, Richard Maisiak ,LoRetta Mann, Viktoria Mester , Robert Morris, C Douglas Witherspoon ,The Ocular Trauma Score (OTS) , Ophthalmol Clin North Am.2002 June ;15(2) :163-5,vi.

2. Rahman I, Maino A, Devadason D, Leatherbarrow B. Open globe injuries: factors predictive of poor outcome.Eye(Lond).2006;20:1336-41.Epub 2005 Seot23

3. Seng C Loon MMed1,2 ,Wan T Tay Bsc(Hons 01 , Seang M Saw PhD5,6 and Tien Y Wong PhD Prevelance and risk factors of ocular trauma in an urban south-east Asian population ;The Singapore Malay Eye study , Clin Exp Ophthamol2009 May

4.Rupesh Agarwal 1, Ho Sue Wei 2, Stephen Teoh1, Department of ophthalmology , National healthcare group eye institute ,Tan Tock Seng Hospital , 11 Jalan Tan Tock Seng , Singapore Mininstry of health holdings , Meidcal officer , Ophthalmology , Singapore

5.Sscmidt GW1 , Broman AT , Hindman HB, Grant MP, Vision survival after open globe injury predicted by classification and regression tree analysis, Ophthalmology , 2008;115:202-9 .Epub2007 June 27

6. C Yu Wai Man and D Steel, Department Opthalmology , Visual outcome after open globe injury :a comparison of two prognostic models –The Ocular Trauma Score and the Classification and Regression tree , , Eye (lond).2010 Jan.

7. Mehul Shah , MD , Shreya M Shah ,MD ,Adway Appplewar ,MD , Chintan Patel ,MBBS , Shasank Shah , MBBS , Utsav Patel , MBBS , Ocular Trauma Score : A useful predictor of visual outcome at six weeks in patients with traumatic cataract , J. Cataract .Refract Surg.2012 Jun
8. Burak Turgut , Sabiha Gungor Kobat , Rumeysa Tanyidizi , The usage of ocular trauma scoring in visual prognostic evaluation of traumatic eye injury.Medicine Science 2014;3(2);1224-33
9. Unver YB1 , Kapran Z , Acar N , Altan T. Ocular trauma score in open globe injuries , J.Trauma.2009:66;1030-2.