

## Ocular trauma in Mosul. Descriptive study

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### ABSTRACT

**Objective:** To determine the incidence of ocular trauma (OT) in Mosul.

**Methods:** Retrospective case series study of (156) patients of OT admitted to Al-Jamhori Teaching Hospital, who were referred from emergency department to ophthalmic unit during one year from 1<sup>st</sup> Jan. till 31<sup>st</sup> Dec. 2010. Data regarding age and sex of patients, and types, causes and season of injuries were noted.

**Results:** About 4.4% (156 out of 3307) of patients admitted to ophthalmic unit as (OT) in one year period and 4.3% of operations (101 out of 2335) done for OT in operative theater, 85.2% were males, and 89.1% were 30 years and younger. Mean age was 15.8 years  $\pm$  13.2 SD, 60.3% (94/156) were open-globe injuries and there were seasonal differences.

**Conclusion:** Young age males were mostly affected and open-globe injuries were the commonest types. Also there were seasonal differences.

### الإصابات العينية في الموصل. دراسة توضيحية

عامر يحيى رجب

فرع الجراحة، كلية الطب، جامعة الموصل، الموصل، العراق

#### الخلاصة

**الهدف:** لتحديد الوضع الوبائي لصدمة العين في الموصل.

**التصميم:** دراسة تراجعية.

**المكان:** شعبة العيون في المستشفى الجمهوري بالموصل.

**النتائج:** ١٥٦ مريضاً ٨٥,٢% من الذكور. ٨٩,١% أقل من ثلاثين سنة. ٦٠,٣% من الإصابات من إصابة كرة العين المفتوحة معدل الذكور/الاناث ٥,٨ : ١، ٤,٤% أدخلوا الى ردهة العيون و ٤,٣% من عمليات العيون هي للإصابات العينية وأكثر الإصابات بالربيع والخريف. أسباب الإصابة من ألعاب الأطفال النارية وإصابات القنابل والسيارات المفخخة والأدوات المنزلية.

**الإستنتاج:** حملة توعية الى الآباء والأمهات للإهتمام بالأطفال وطرق لعبهم. لأن أكثر الإصابات تحدث عند الأطفال الذكور وفي فصلي الربيع والخريف.

### INTRODUCTION

Ocular trauma (OT) especially open-globe form, is the most common cause of monocular visual impairment and blindness worldwide, with significant socioeconomic impact.<sup>1,2</sup> OT is an important, preventable worldwide public health problem.<sup>3</sup> In the USA more than 40 thousands patients get permanent visual impairment.<sup>4,5</sup>

Although it affects all age groups, previous studies had indicated that young males are mostly affected with the majority younger than 30 years.<sup>6</sup>

Incidence rate for hospitalized OT in developed world ranges from 8 per 100,000 in Scotland<sup>7</sup> through 13 per 100,000 in United States,<sup>8</sup> to 33 per 100,000 in Papua New Guinea.<sup>9</sup>

The situation is certainly worse in developing countries where the problem is compounded by general lack of access to preventive health care at all levels. When considering eyes injuries requiring hospital admission, rates had ranged from 8 to 57 per 100,000.<sup>10-15</sup> Despite the heterogeneity of results, these studies provide important information regarding the burden of eye injury.

The pattern of presentation of OT revealed a form of bimodal distribution over the one year period. There was a rise in cases between March and May tapering off in June and a second increase in September to November, tapering off in December, these patterns are especially so for the farmers and school-going children.<sup>16</sup>

Ocular trauma is classified by the standardized international classification of ocular trauma (Birmingham Eye Trauma Terminology BETT).<sup>17</sup> Moreover the ocular trauma classification system (OTCS),<sup>18</sup> classified the ocular trauma on basis of visual acuity, anatomical location of wound, mechanism of injury and presence of an afferent pupillary defect; also referred to ocular trauma score (OTS)<sup>19</sup> in evaluating the final visual outcome.

This study is aimed at providing an epidemiologic data on the current situation of ocular trauma in part of Mosul city based on hospital records, for the sake of planning and provision of eye care and safety strategies for prevention of such injuries in the region.

## PATIENTS AND METHODS

Retrospective case series study involving a review of all cases of ocular injuries admitted to Al-Jamhuri Teaching Hospital which were referred from emergency department to ophthalmic unit and the primary surgical intervention performed in ophthalmic theater under supervision of specialists, in one year period from 1<sup>st</sup> Jan. till 31<sup>st</sup> Dec. 2010.

Patients' information from the case sheet were retrieved and analyzed. Data regarding age and sex of patients, and types of injuries, cause and season of injuries were noted. In this study ocular trauma is defined as any injury affecting the eye or adnexa requiring hospital admission.

Ocular injuries were classified using the Birmingham Eye Trauma Terminology (BETT)<sup>17</sup> system which is not depending on visual acuity.

**Box 1** shows definitions used in the BETT.

### Box 1. Ocular trauma definitions.

Lamellar laceration	Partial-thickness wound of eye wall
Laceration	Full-thickness wound of eye wall caused by sharp object
Rupture	Full thickness wound of eye wall caused by blunt object
Penetration injury	Eye wall laceration with no exit wound
Perforation injury	Eye wall laceration with exit wound

Eye wall: the cornea, sclera, inner layer of choroid and retina excluded.

Patients with blunt force have contusion closed globe injury (CG injury) or rupture open globe injury (OG injury) and those with sharp forces have lamellar, laceration (CG injury) or penetrating, perforating and intraocular foreign body (IOFB), laceration (OG injury).

## RESULTS

A total of 156 patients with OT were admitted to ophthalmic unit who were referred from emergency department during the study period. Sixty four point seven percent needed surgical intervention and the rest (35.3%) were treated conservatively.

Ocular trauma cases represented 4.4% of the total admission to ophthalmic unit, 85.3% (133/156) were males, with a male to female ratio of 5-6:1 as shown in **Table 1**.

The mean age was 15.8±13.2 SD (range from 6 months to 59 year), 89.1% of them were 30 years and younger and 62.2% (97/156) were children 16 year and younger as shown in **Table 1**.

Open globe OT were by far the most common types of injuries 48.7 (76/156), 39.7 (62/156) close globe OT, and 11.6 (18/156) adnexal injuries, all cases were monocular as shown in **Table 2**. Sixty two point two percent of OT were caused by sharp, and 37.8% were due to blunt injuries.

Etiologically a wide range of objects were involved, these included children toys (used in Eid celebration), bomb, shells, exploded gun powder, twigs, pieces of wood, sharp sticks, pencils, catapult and brawls.

The clinical and surgical procedures performed were summarized in **Table 3**. The most common primary surgery was reconstitution of the globe integrity with reposition or excision of ocular contents. All surgeries were performed within 12 hours of presentation to the hospital.

**Table 1.** Age-sex distribution of the cases of OT.

Age	Male	%	Female	%	Total	%
0-10	51	32.7%	20	12.8%	71	45.5%
11-20	33	21.2%	2	1.3%	35	22.5%
21-30	32	20.5%	1	0.6%	33	21.1%
31-40	9	5.8%	0	0	9	5.8%
41-50	2	1.3%	0	0	2	1.3%
51-60	6	3.8%	0	0	6	3.8%
Total	133	85.3%	23	4.7%	156	100%

Table 2. Types of injury.

Types of injury	Numbers
<b>Closed injury</b>	<b>62</b>
Lamellar laceration	8
<b>Contusion</b>	<b>54</b>
Contusion with corn FB	28
Hyphema	24
Lens dislocation	0
Viterous Hemorrhage	2
<b>Open injury</b>	<b>76</b>
<b>Laceration</b>	<b>71</b>
Penetrating injury limited to cornea	10
Penetrating corneal injury involving lens or uvea or both	40
Penetrating corneal injury with or without lens involvement	10
Intraocular FB	11
Globe rupture	5
<b>Adnexal injury*</b>	<b>18</b>
<b>Total</b>	<b>156</b>

\* Eyelids.

Table 3. Procedure employed for treatment of hospitalized patients with OT.

Procedure	Percentage (number)
1 Medical therapy and simple repair of OT. (including primary repair of eyelid, conjunctiva, cornea and scleral wounds) and removal of FB from cornea and AC.	51.3% (80)
2 Complex repair of ocular injuries (including repair of large corneo-scleral wound, excision of prolapsed uveal tissue, removal of lens, anterior vitrectomy.	38.5% (60)
3 Removal IO FB from post chamber and post segment by use of magnet.	7% (11)
4 Enucleation of eye ball in rupture globe, primary or secondary enucleation.	3.2% (5)
<b>Total</b>	<b>100% (156)</b>

The majority of primary repairs of open globe injuries were done by suturing of the wound with or without excision of prolapsed intraocular content or lensectomy (65.2%) (60/92).

Four primary encucleations were performed for severely ruptured globes, and one needed secondary encucleation, all these injuries were caused by bomb or shell. Among the open globe injuries, lensectomy was performed in 5 cases (5.4%) during primary repair and in 12 eyes with traumatic cataract; lens removal was deferred due to the state of the eye and technical difficulties.

Sixty two point two percent of the patients were school children (16 years and younger). The remaining 37.8% belonged to soldiers, policemen, farmer office workers, house wives and businessmen.

The pattern of presentation revealed a form of bimodal distribution over one year period; there was a rise in spring 42 patients (26.9%) (March to May) and autumn 43 patients (27.6%) (September to November) (Figure 1) which may be due to spring outings and Eid celebration (in Autumn). However, there was no statistical significance regarding different seasons.

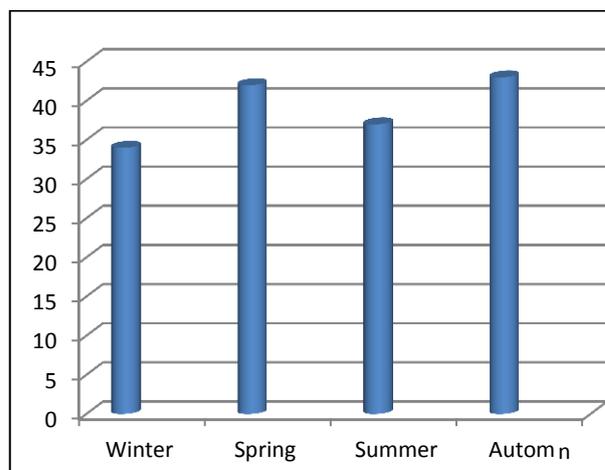


Figure 1. Distribution of OT patients during seasons of one year.

### DISCUSSION

Ocular traumas are common and largely a preventable cause of monocular visual impairment and blindness. Hospital-based studies shows that 5% to 16% of all ophthalmic admissions to eye hospital/units are related to ocular trauma.<sup>20</sup>

The incidence of 4.4% found in our study is consistent with previous reports. The propensity toward young male and school-going children was consistent with those identified by others. Our results of 85.3% male and 89.1% aged younger than 30 years paralleled the trends reported by other authors.<sup>7,8,20,21</sup>

This pattern of distribution, with the majority of cases involving young and working groups, highlights the socio-economic burden of OT on our communities.

In most previous studies occupational injuries were reported to be the commonest cause of OT in adults. But in our study most of the OT occurred in children (62.2%) which may be due to neglect and

uses of harmful toys or games. In developing communities most of injuries occur in farming activities, while industrial activities in developed communities were responsible for the majority of cases.<sup>8-11</sup>

The bimodal distribution over one year period in spring and autumn may be due to spring outings and Eid celebrations.

The lack of improvement in many of the cases due to our inability to manage some of the complications associated with OT, the lack of vitreo-retinal and corneal expertise, and equipment to manage these complications, might have contributed adversely and led the patients to seek medical advice outside Mosul city.

The presence of cataracts which were not operated upon due to reasons afore-mentioned may have contributed significantly to the poor outcome seen at discharge. In our setting, however, the problem is compounded by low review visits by patients following discharge from hospital.

## CONCLUSION

1. Ocular traumas were more common in male children, and in Spring and Autumn seasons.
2. Open globe injuries were the commonest types of injuries.

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