Epidemiološka studija kontuzionih povreda oka
Epidemiology Study of Ocular Contusion Injuries

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SAŽETAK

Uvod. Cilj je bio da se analizira povećanje / smanjenje broja različitih kontuzionih povreda oka, između hospitalizovanih i ambulantnih pacijenata, uključujući epidemiološke karakteristike.

Metode. 444 pacijenata sa kontuzionim povredama oka (hematom kapaka, subkonjunktivalni krvni podliv, erozija rožnjače, hiđema, istrnuće korena irisa, katarakta / sublukusacija sočiva, horioretinalna krvarenja i povreda orbite / lezije optičkog nerva) koji su observirani od strane oftalmologa iz Kliničkog Centra Kragujevac, analizirani su i uključeni u retrospektivnu studiju od 2007-2012. godine. Epidemiološke karakteristike su bile: pol, starost, vreme (kalendar), lokacija profesionalne povrede, urbana ili ruralna sredina i tretman kontuzionih povreda oka (hospitalizovanih i ambulantnih pacijenata). Statistička analiza je uvedena u SPSS programu, verzija 20.00 (Hi-kvadrat test, Kruskal Volis-ov test, vrednost p uključuju tačne vrednosti, veće od 0,01).

Rezultati. Od ukupnog broja pacijenata sa kontuzionim povredama oka 197 (44,37%) su tretirani u bolničkim uslovima, a 247 (55,63%) ambulantno. Odnos hospitalizovanih i ambulantnih kontuzionih povreda oka je bio: u korist hospitalizovanih, samo u 2007. godini - 51 (56,66%), više u korist ambulantnih je bilo od 2008 - 2012., a osim u 2010. godini, u kojoj je odnos hospitalizovanih i ambulantnih bih ekvivalentan - 32 (32,07%).

Zaključak. Većina kontuzionih povreda oka je bila kod muškaraca 342 (77,03%), starosti od 20-50 godina - 166 (37,39%), češće u jesenjim mesecima od septembra do decembra - 214 (48,20%), više na sportskim aktivnostima - 166 (37,39%) i češće u urbanim sredinama - 230 (51,8%). Broj povredenih, a hospitalizovanih pacijenata opada, a broj ambulantnih raste, što je evidentno tokom ovih šest godina analiziranja.

Kljucne reći: povreda oka; kontuziona povreda oka; epidemiologija; hospitalni tretman; ambulantni tretman

ABSTRACT

Objective. Aim of article was to show analysis of increase/decrease number of various close contusion of eye between hospital and ambulance patients with epidemiology characteristics.

Methods. Of 444 patients with traumatic ocular injuries (hematoma palpebral, suffusion conjunctiva, erosion corneal, hyphema, iridodialysis, cataact/subluxatio of lens, haemorrhage chorioretinal and trauma orbit/optic nerve, who were referred by ophthalmologists from Clinical Centre of Kragujevac, evaluated and included in retrospective study from 2007 to 2012. Epidemiological characteristics included: sex, age, time (calendar), location of professional trauma, address (urban, rural) and treatments of injury (number of hospital and ambulance). Statistical analysis was done with SPSS program, version 20.00 (Chi-square test, Kruskal–Wallis test; p-value include the exact value unless, it is less than 0.01).

Results. The total number of patients with contusion was 444 which 197 (44.37%) were treated in hospital and 247 (55.63%) by ambulance. Relationship of hospitalized and outpatient, the contusion injuries in favor of first only in 2007, 51 (56.66%), and increased outpatient injury is higher in all of remaining 2008 – 2012, except in 2010 where ratio of hospitalized/ambulance was equivalent 32 (32.07%).

Conclusion. The most of injuries were 342 (77.03%) men, aged 20-50 years – 166 (37.39%), in autumn months from September to December – 214 (48.20%), with sport activities – 166 (37.39%) and in urban areas – 230 (51.80). The number of hospital is declining, and number is growing ambulance is changing slightly, but total number of violations evidently is declining by 6 years.

Key words: ocular trauma; contusion of eye; epidemiology; hospital treatment; ambulance treatment
INTRODUCTION

The eye is complex, both anatomically and path-physiologically, with intricate system of specialized structures, it has protectors including bony of orbit, bat injuries of eye are subjects. Across all demographics of injury (sex, age, time, home, workplace, sports/recreation, urban/rural areas), the most common type of eye injury, we be reported to close injury - contusion (case-control series). The Kragujevac is located in Central Serbia, 125 km south of Belgrade. The area of the city covers of 835 km² and population density of 216/km². Total catchment area has over 350000 residents (www.regpol.rs). City is an industrial, sports, educational and health center of Sumadija and neighboring regions (www.overserbia.com), and our ophthalmic unit is referent in Clinical Centre for larger geographic area.

PATIENTS AND METHODS

The study included all patients with close ocular trauma at Clinic of Ophthalmology in Clinical Centre of Kragujevac, in the period from December 2007 to December 2012. The study was approved by the regional Ethic Committee. In this study, ocular injury was defined as any injury affecting the eye requiring hospital admission and ambulance treatments. Patient’s data included the sex, age, time of injury, location of injury, the place of residence and anatomical site (nature of injury). Eye injury we have classified the data (by anamnesis) in: work related injuries, home related injuries, sport-recreational/related injuries, road accident related injuries, assaults related injuries, and rare various outdoor activities related injuries.

Inspect eye with/without placing pressure use Demares’ retractors, and by slit lamp examinations, with visual acuity by Snellen test, by indirect ophthalmoscope, by perimetry, ultrasound tests, etc. The use of imaging modalities like ultrasound and computed tomography (CT) can be useful adjuncts in the management of some patients.

The standard roentgen-graph, CT and magnetic resonance imaging (MRI) have been employed in managing ocular trauma. The statistical analysis of quantitative data, including descriptive statistics, parametric/non parametric of comparison, was performed for variables. Frequency analysis was performed by Chi-square test and Kruskal-Wallis test. Statistical analysis was done by SPSS, versus 20.00 (p values include the exact value unless, it is less than 0.01).

RESULTS

The total number of patients with contusion of eye was 444, of which 197 (44.37%) were treated in hospital and 247 (55.63%) by ambulance.

Number of hospital patients be meaningful different by years observation ($x^2 = 22.137$, $p = 0.000$), while the number of ambulance patients statistical statement not different meaningful ($x^2 = 3.421$, $p = 0.635$). Number of hospital is declining, and the number is growing ambulance is changing slightly, but the total number of violations evidently is declining. The highest frequency is observed in 2007 and 2008 - 90 (20.27%) and 89 (20.05%), since 2009 - 2012 moderate decrease proportional to 72 (16.22%) cases in 2009; 64 (14.41%) cases in 2010; 65 (14.64%) in 2011 and 64 (14.41%) in 2012. Number of violations during 2007 and 2008 is about the same, that statistical statement is not different ($x^2= 0.006$, $p=0.940$), but this is year with the largest number of violations. Relationship of hospitalized and outpatients of contusion injuries in favor of the first only in 2007 - 51 (56.66%) hospital and 39 (15.79%) ambulance, increased outpatient injury was higher in all of the remaining 2008 - 2012, that in 2008 was 42 (21.32%) hospital and 47 (19.03%) ambulance, in 2009 was 31 (15.74%) hospital and 41 (16.60%) ambulance, in 2011 was 22 (11.17%) hospital and 43 (17.41%) ambulance, in 2012 was 19 (9.64%) hospital and 45 (18.22%) ambulance, but except in 2010 where the ratio of hospitalized/outpatients was equivalent 32 (16.24%)and 32 (12.95%) of the patients. There is no significant change in annual rates of total injuries during the six years ($x^2 = 10.351$, $p = 0.066$), that means that this test does not shows statistical statement especially significant difference in the number of patients for years observation, table 1, (figure 1a).

<table>
<thead>
<tr>
<th>Year</th>
<th>Hospital</th>
<th>Ambulance</th>
<th>Σ %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>51(25.89%)</td>
<td>39(15.79%)</td>
<td>90, 20,27%</td>
</tr>
<tr>
<td>2008</td>
<td>42(21.32%)</td>
<td>47(19.03%)</td>
<td>89, 20,05%</td>
</tr>
<tr>
<td>2009</td>
<td>31(15.74%)</td>
<td>41(16.60%)</td>
<td>72, 16,22%</td>
</tr>
<tr>
<td>2010</td>
<td>32(16.24%)</td>
<td>32(12.95%)</td>
<td>64, 14,41%</td>
</tr>
<tr>
<td>2011</td>
<td>22(11.17%)</td>
<td>43(17.41%)</td>
<td>65, 14,64%</td>
</tr>
<tr>
<td>2012</td>
<td>19(9.64%)</td>
<td>45(18.22%)</td>
<td>64, 14,41%</td>
</tr>
<tr>
<td>Σ 6</td>
<td>197, 44.37%</td>
<td>247, 56.63%</td>
<td>444, 100%</td>
</tr>
</tbody>
</table>

Table 1. Correlation the number of patients (hospital/ambulance) by 6 years
The clinical diagnosis in our tertiary center, during the last six years has recorded of eight species allocated frequent eye contusion injuries, such as hematoma palpebral, suffusion conjunctiva, erosion corneal, hyphema, iridodialysis, cataract/subluxation of lens, haemorrhage chorioretinal and the trauma of orbital region with the most affection of the optic nerve.

Hematoma palpebral were outnumbered males 77 (22.51%), in the younger age population to 20-50 years of age – 36 (21.69%) patients, and only 19 (14.29%) after the 50th years old. The frequency of these injuries is increased in the direction of fall and winter calendar months, with the largest frequency 39 (18.22%) from September to December. The place of the largest number was to work 39 (24.22%), of professional duties including professional competition and recreational entertainment, and in the urban regions of 51 (17.54%), in age of 20-50 years with 30 (18.07%), mainly in autumn calendar months (from September to December) of 40 (18.69%), of 37 (22.29%) in sport, then 23 (14.29%) at professional work, and urban environments - 48 (20.87%). Iridodialysis of eye, uprooting planks from the roots, is more common in men 28 (8.19%), at the age of 50 years - 14 (10.53%), from IX-XII calendar month - 18 (8.41%), of 20 (17.09%) under house works, in rural environments - 21 (9.81%). Traumatic cataract with/ without subluxation of lens is more common in men 31 (9.06%), at the age of 50 years of 21 (15.79%), in the autumn months, from September to December - 19 (8.88%), of 16 (9.94%) in professional jobs, and of 22 (10.28%) in rural conditions. Chorioretinal bleeding is more common in men 29 (8.48%), of aged 50 years - 26 (19.55%), from IX-XII of calendar month – 28 (13.08%), in housework - 18 (15.38%), in rural of 28 (13.08%). Trauma of orbital region with affection of optic nerve is more common in men 10 (2.92%), at the age of 20-50 years - 8 (4.82%), from IX-XII of calendar month – 13 (6.07%), with jobs at workplace 7 (4.35%), and in rural areas 8 (3.74%), table 2.

Table 2. The analysis of the epidemiology (sex, age, calendar, location and area) with various close contusion of the eye (number of patients)
Of total number of patients with contusion of the eye were 342 (77.03%) males and 102 (22.97%) females, so that difference is high statistically significant by sex \( (x^2 = 129.730, p < 0.01) \), table 2. There is high statistically significant difference by age group, that is the most common of 20-50 years age (Kruskal-Wallis test = 308.949, p < 0.01) table 2. There is high statistically significant difference by time period, that is the most common of trauma is in IX-XII mounts (Kruskal-Wallis test = 142.001, p < 0.01) table 2. There is high statistically significant difference by locations of activities, that is the most common of trauma of eye is in sports (Kruskal-Wallis test = 369.266, p < 0.01) and rare is in home works, table 2. There is no clear statistically significant between in urban or rural areas \( (x^2 = 0.577, p < 0.448) \) table 2.

**DISCUSSION**

Despite the fact that ocular trauma is important cause of blindness worldwide, scant information is available regarding its epidemiology outside the middle developed countries. Every year, approximately 2 million eye injuries occur in the United States, of which, more than 40 thousand results in permanent visual impairment\(^1\). Eye care programs targeting high risk ocular trauma groups may need to consider ocular trauma as a priority in eye health awareness strategies to reduce blindness due to trauma. Based upon our findings, health education and safety strategies, which have traditionally targeted the workplace, sports, and other high risk activities, should also target high risk activities at home (ocular trauma in southern Italy)\(^3\).

To determine the pattern of ocular injuries in patients presenting to the eye clinic and the accident and emergency department of Medical Center of Nigeria; in the current series, blunt eye injury was the most common type of ocular trauma. This community should be educated and informed about the importance of preventive measures including protective eye devices during high risk activities \(^2\).

In some study, ophthalmic trauma comprised 6.78% of the hospital admission. Almost 80% patients were male, and 69% patients were below 30 years of age. The lens damage and hyphema was seen in more than 50% of the patients. The common causes of injury were violence in 37.37%, occupational in 24.43% and domestic accidents in 19.18%, likewise as well as in our study \(^3\).

The Upper East is the poorest and most rural region in Ghana and ocular injuries are a major public health problem. Some study were at providing epidemiologic data on the burden of trauma problem in order to facilitate the prevention of such injuries in their region\(^4\).

The Ocular Trauma Classification Group, a committee of 13 ophthalmologists from seven separate institutions, was organized to discuss the standardization of ocular trauma classification (the characteristics and outcomes of eye trauma, and a classification system based on standard terminology, and features of eye injuries at initial examination that have demonstrated prognostic significance), as our country did\(^5\).

The recent survey of general hospitals by the Victorian Injury Surveillance System found that ocular trauma represented 15% of work related injuries. As circumstances surrounding occupational eye injuries have been poorly documented previously, their associations to occupation, industry and work safety practices, including safety eyewear use, need to be identified to develop appropriate preventive strategies for high risk groups in Australia\(^6\).

The computed tomography and magnetic resonance imaging have been employed in managing ocular trauma (the contusion of eye) as the authors think, too\(^7\).

In our study, men were affected more than women, with the outdoor environment, workplace and at home, the most commonly reported locations of trauma. Men were subjects in violations of eye relief, due to the nature of professional work.

Mean age group (20-50 years) are the active working population related to existential life. The majority of injuries occurred in males, less than 30 years of age, with a slight predominance in the second to fifth decade. A male preponderance universally reported and thought to be related to occupational exposure, participation in dangerous sports and hobbies, and risk taking behavior. The similar risks observed sex with the older age range appears to be related to changes in lifestyle and occupational patterns by men after age 50 years. Young people (first and second decade) represented 15% of work related injuries. As circumstances surrounding occupational eye injuries have been poorly documented previously, their associations to occupation, industry and work safety practices, including safety eyewear use, need to be identified to develop appropriate preventive strategies for high risk groups in Australia\(^6\).

The autumn is the time of initial jobs, schools and sports activities, as well as agricultural, forest and other works, and then preparations food and clear houses, etc. The eye injuries in the home are caused by a wide variety of items, including household products, tools, outdoor equipment, paint, debris generated by power tools and lawn equipment, automobile mechanic materials, etc. The most common causes overall are welding equipment, household cleaners, workshop items, etc. Among men, injuries attributable to...
hardware, tools, construction, sports, and lawn equipment have been found to be more common, whereas among women, more injuries are attributable to chemicals, housework, etc. The sports most commonly related to eye injuries are football, basketball, water sports, etc and the rate of injury for specific sports varies according to age. Relationship violation of eye in rural or urban areas, without the domination of one, environment in the discussion: a crossing heavy industry of our city and near areas in develops of automobile industry, food industry, chemical industry and trade in Central Serbia, now.

Authors reported various ocular lesions caused by accidental instillation of close mechanical trauma (contusion) by 6-years of epidemiology study. The most of the injuries were 342 (77.03%) men, aged of 20-50 years – 166 (37.39%), in the autumn months from September to December – 214 (48.20%), with the sport activities – 166 (37.39%) and in urban areas – 230 (51.80). The number of hospital is declining, and the number is growing ambulance is changing slightly, but the total number of violations evidently is declining by 6- years. Number of violations during 2007 and 2008 is about the same, but these are years with the largest number of violations. The hematoma palpebrarum was the most common of contusion of the eye with 92 (20.72%). The ophthalmic trauma is our major public health problem, as well as in each medium developed country of the world.

REFERENCES


