LUMEN ET VIRTUS

Epidemiology of ophthalmologic cases in care: Literature review

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Clara Boulos Del Arco[1], João Francisco Garcia Soler Miron[2] and Thaissa Faloppa Duarte[3]

ABSTRACT

Objective: to evaluate the management of ophthalmologic cases in emergency care services based on studies and case reports, highlighting the main conclusions and recommendations found in the scientific literature. Methods: We conducted a comprehensive search in the following databases: PubMed, Virtual Health Library (VHL), Scielo, Scorpus, and Google Scholar. To aid in the search, the following keywords were used: "Ophthalmology"; "Ophthalmological Trauma"; "Management in Emergency Care". Studies were selected based on their relevance to the topic and included those that addressed causes, types of lesions, epidemiological profile, and therapeutic approaches related to cases treated in ophthalmological emergency care. All studies that did not meet the central theme or that were not available in full for analysis were excluded. Results: The reviewed studies provided an epidemiological view of ophthalmologic cases treated in emergency care services. Among the findings, it was highlighted that ophthalmologic trauma can be caused by a variety of causes, such as car accidents, falls, aggressions and sports injuries. The most common injuries are open eye trauma, scleral perforation, and eye degloving. Epidemiological studies also show the distribution of cases by age, gender and predominant causes, and within clinical care, conjunctivitis is the most common disease. Conclusion: Ophthalmologic management in the emergency room is extremely complex, requiring immediate treatment. Studies highlight the diversity of causes and associated injuries, emphasizing the need for personalized approaches. Finally, managing eye trauma in emergencies requires individualized approaches and expertise due to the variety of injuries and causes involved.

Keywords: Ophthalmology, Ophthalmic Trauma, Ophthalmic Trauma Management

[1] Union of Great Lakes Colleges (unilago)
[2] Union of Great Lakes Colleges (unilago)
[3] Redeemer Eye Hospital
Eye Hospital Clinic and Surgery

INTRODUCTION

Ophthalmologic trauma represents a significant public health concern, requiring immediate and specialized attention to mitigate potential visual sequelae. In emergency care settings, where speed and efficiency are crucial, traumatic events related to ophthalmology emerge as a vital area of intervention.

The urgency in the treatment of ophthalmologic trauma is emphasized by the findings of relevant epidemiological studies. Rassi et al.[1] highlighted the magnitude of the challenge of treating ophthalmic trauma. The research by Campos et al.[2] complements this perspective, outlining the epidemiological profile of care in a public ophthalmological emergency service, offering broad views on the demographic characteristics of the patients involved.

The variety of ophthalmologic trauma situations presents specific challenges that require different management strategies. Cecchetti et al.[3] explored the clinical and epidemiological profile of ocular emergencies in an emergency room, contributing to the understanding of the different clinical manifestations.

In this context, this article aims to consolidate and synthesize the evidence and recommendations from these studies, contributing to a comprehensive understanding of the management of ophthalmologic trauma in emergency care.

MATERIALS AND METHODS

The identification of articles related to Ophthalmology, with emphasis on Ophthalmological Trauma and Management in Emergency Care was achieved through the combination of: use of Boolean operators AND and OR to combine keywords pertinent to the theme: "Ophthalmology", "Ophthalmic Trauma", "Emergency Care Management". Example: "Ophthalmology" OR "Ophthalmic Trauma" AND "Emergency Care Management".

The search for references was made in relevant databases such as: PubMed, Scopus, Web of Science, Virtual Health Library (VHL) and Google Scholar. For the selection of articles for analysis, they should address aspects related to Ophthalmology, Ophthalmological Trauma and Management in Emergency Care.

All studies not related to the theme or with inadequate methodologies were excluded, as well as those that were not available in full for analysis, which were not available in Portuguese, English or Spanish. The identification of relevant articles took place through the initial review of titles and abstracts to identify articles aligned with the scope of the research.

The analysis and selection of articles was made after reading the selected articles to assess the relevance and quality of the information. Epidemiological studies, reviews, clinical trials, and case reports were included. The methodology used aimed to cover a variety of studies related to

Ophthalmological Trauma in Ophthalmology, with special attention to Management in Emergency Care, presenting in this a comprehensive synthesis on the chosen theme.

RESULTS AND DISCUSSION

The main articles that stood out on this subject were:

Cabral et. al.[5] analyzed 351 ophthalmological emergency visits at the Goiás Eye Bank Foundation. The research explores the nature of ocular trauma, examining the incidence, clinical characteristics and therapeutic approaches adopted in the emergency context.

The research presents relevant data on the prevalence and complexity of ocular trauma cases in the region, contributing to a clear understanding of this ophthalmological presentation. The importance of effective and immediate management of these cases is also highlighted, considering the sensitivity and complexity of the eyes.

The main results of the study by Cabral et al.[5] were:

- A total of 153 ocular traumas were found (43.6% of the attendances), with a predominance of males in 131 cases (85.6%).
- The most affected age group was young adults aged 20 to 39 years, in 90 cases (58.8%).
- Goiânia was the most frequent origin in 89 cases (58.2%).
- Superficial foreign body blunt mechanical trauma was the most common type of trauma with 95 cases (66.4%).
- Medical treatment was largely more prevalent in 149 cases (97%).

Hagui et.al.[6], presents a retrospective study that outlines an epidemiological profile of patients with ophthalmologic emergencies and the prevalence of conjunctivitis in two seasons of the year. The structure and flow of patients in the ophthalmic emergency department were explored in detail, allowing us to understand the reality of the demands and challenges faced by this service.

Hagui et.al.[6] provides valuable information on the organization of urgent care in ophthalmology and highlights the particularities of this environment in comparison with general emergency services. By presenting specific data and analyses of this hospital context, the authors contributed to a broad understanding of the challenges faced by ophthalmology professionals working in emergency departments, providing relevant clarifications for future improvements in the management and care of cases of ophthalmological urgency.

Observe os achados de Hagui et.al.[6]:

- A total of 2086 medical records were reviewed. Males accounted for 51.9% of the cases. The mean age was 38 ± 21 years.
- The conjunctivitis group stood out, with 46.4% of the total diagnoses. Infectious conjunctivitis (viral and bacterial) accounted for 57.1%, 46.7%, 57.6%, 59.3% and 54.7%

of the total conjunctivitis in the age groups of 0-9 years, 10-19 years, 20-39 years, 40-59 years and ≥60 years, respectively.

- In the summer, among conjunctivitis, allergic conjunctivitis was the most prevalent (34.7%), followed by viral (29.6%), bacterial (27.2%) and unspecified (8.5%). In winter, viral (35%) had the highest prevalence, followed by allergic (34.7%), bacterial (21.7%) and unspecified (8.6%).
- Conjunctivitis was responsible for 78.5% of diagnoses in the 1st decade of life against 26.4% from the 7th decade onwards.
- The other most prevalent diagnoses were hordeolum/chalazion (9.59%), keratitis or bacterial ulcer (6.52%), and hyposphagma (5.51%).

By framing these evidences in the guiding questions of this article, the conclusions of the study on the ophthalmic emergency department at a hospital in southern Brazil gain significant practical relevance. The finding that conjunctivitis, especially infectious conjunctivitis, leads the diagnosis, suggests the importance of effective strategies for the management of these specific conditions in ophthalmic emergency care settings. The identification of the most affected age group, between 0 and 9 years, indicates the need for specific protocols for children, highlighting the importance of educating parents about ophthalmologic care in this age group in emergency room settings.

Rassi et.al.[1], presents a study that analyzes the prevalence and circumstances of ophthalmological urgencies and emergencies in the Emergency Room of the Hospital de Clínicas de Uberlândia of the Federal University of Uberlândia (HCU-UFU) and in the Amélio Marques Outpatient Clinic from August 2016 to August 2017. It addresses a crucial theme to understand the distribution and nature of ophthalmological conditions that lead to emergency care in a high-level university hospital environment.

Rassi's study et.al.[1], presented the following information:

- Data were collected from medical records, including information on gender, age, and occupation/occupation.
- The study showed that males were the most affected and the most incident age group was between 19 and 45 years.
- Of the causes of seeking ophthalmological emergency care, ocular trauma due to a foreign body is the most common, with a close relationship with work activities (mechanics and ironmongers).

Regarding the epidemiological profile, the study carried out by Rassi et.al.[1], offers relevant information regarding the epidemiological profile of ophthalmological emergencies, including demographic data, such as age, gender, and geographic distribution of patients. The discussion

addresses the most frequent diagnoses and the predominant causes of ophthalmologic emergencies identified in the study. This allows for the identification of priority areas for preventive and educational intervention, as well as guiding screening and treatment protocols.

Regarding demographic information, it was found that 58% of the patients treated were male, while 42% were female. For a more detailed analysis of the age groups, 11 categories were created with 9-year intervals, revealing that: 7.42% of the patients were aged between 0 and 9 years; 4.28% between 10 and 18 years old; 13.71% between 19 and 27 years old; 17.42% between 28 and 36 years old; 15.42% between 37 and 45 years old; 12.85% between 46 and 54 years old; 14.57% between 55 and 63 years old; 9.14% between 64 and 72 years old; 4% between 73 and 81 years old; 0.57% between 82 and 90 years old; and 0.57% between 91 and 99 years old. In the analysis of patients' occupations, retirees (16.16%), students (15.15%), and housekeepers (9.1%) stood out, followed by general services (8.41%), bricklayers (8.1%), attendants/salespeople (7.74%), domestic employees (3.7%), administrators (3.03%), cooks/confectioners (2.69%) and nurses (2.35%)[1].

Regarding the demand for emergency ophthalmological care, the main cause was ocular trauma due to a foreign body, representing 25.51% of the total attendances, with a close relationship with work activities, especially among mechanics and ironmongers. Conjunctivitis was also significant, accounting for 13.52% of the total number of visits [1].

When analyzing the specific occupations, it was observed that certain ophthalmological conditions had a higher incidence in certain professions. For example, among retirees, subconjunctival hemorrhage was more common (17.39%), while conjunctivitis prevailed among students (24.44%). Different occupations presented different patterns of involvement, highlighting the diversity of ophthalmological conditions related to the work environment[1].

The high incidence of foreign body injuries in professions that require the proper use of Personal Protective Equipment (PPE) highlights the importance of implementing and strictly enforcing this equipment to ensure safety and prevent eye trauma in the workplace. These data underscore the need for personalized approaches and preventive strategies targeting specific occupational groups.

Campos et.al.[2] in his study, analyzed the epidemiological profile of visits to an ophthalmic emergency room in Campinas-SP. Aiming at demographic and clinical characteristics and the main reasons that lead patients to seek emergency eye care in a public setting.

The results of Campos et.al.[2] showed the following data:

- The medical records of 2834 patients treated from July to September 2017 were analyzed.
- The prevalence was male (52.6%) and in the age group of 30 to 59 years (43.5%); 21.1% were elderly.

- The most prevalent diagnoses were infectious conjunctivitis (23.9%), ocular trauma (15.7%), and ocular surface diseases (14.6%).
- Among women and children, there was a predominance of infectious/inflammatory conditions; 83.6% of the traumas occurred in men, 62.2% of which were due to a foreign body.

Among the patients who sought the ophthalmological emergency service, there was a predominance of males and the economically active age group, similar to other series[2].

The demand for emergency ophthalmological services is predominantly motivated by ocular traumas of various natures, ranging from the presence of foreign bodies and mild abrasions to bruises and perforations. These events are consistently identified as the main reason for seeking care in national studies on the subject[1]. Ocular trauma had an important predominance in male adults, similar to the study conducted by Rassi et.al.[1].

In this study, infectious conjunctivitis was the most prevalent diagnosis, which may be indicative of inadequacies in the ophthalmological emergency network in the region, since most cases of conjunctivitis can be managed in primary care or by non-specialist physicians[2].

It is noteworthy that 40% of the cases of blepharitis/meibomitis were identified in elderly patients, constituting the second most prevalent diagnosis in this age group. Another study conducted exclusively with the elderly in São Paulo revealed a prevalence of ectropion (a risk factor for eyelid infection/inflammation) of 2.9%, compared to 0.18% in the general population6.

When analyzing the Clinical and epidemiological profile of ocular emergencies in the ophthalmic emergency department HCFMRP-USP, Cecchetti et al.[3] showed that:

- The medical records of 1,483 patients treated throughout 2003 were analyzed.
- The majority of patients were male (1,314 or 89%).
- Foreign body (FB) trauma to the ocular surface was the most common, accounting for 863 (58%) cases.
- Eye protection was used in only 17% (22) of the patients.
- Accidents generally occurred in the workplace 70% (93), and the home was the second most frequent place (22%).
- 34% of respondents had previous eye accidents.

Despite being 16 years old, the epidemiology of ophthalmic care is similar to recent studies mentioned above, the study also exposed that regional aspects, as well as socioeconomic and cultural habits can influence risk factors and access to reference services. Such aspects may explain the variability around the various characteristics of accidents. The predominance of males was maintained. Ultimately, Cecchetti et al.[3] conclude that there is a higher occurrence of ocular trauma among men and accidents caused by foreign bodies. The use of eye protection is still incipient and,

on the other hand, the recurrence of trauma is considerable. A continuous strategy with the population, in a preventive and educational way, with special attention to the work and home environment, is necessary to reduce the occurrence of eye trauma.

Cro's study et.al.[7] analyzes the clinical characteristics of open eye lesions in ocular trauma. The study is a baseline analysis of cases in the national clinical trial ASCOT (Adjunctive Steroid Combination in Ocular Trauma). The aim of this study was to evaluate the clinical characteristics and pathology of a large cohort of patients with open ocular lesions who underwent vitreoretinal surgery.

Among the results of Cro's study et.al.[7], it is noted:

- The majority of participants with penetrating open-globe injuries were white (233, 84%), male (246, 88%), with a mean age of 43 years (IQR 30–55 years).
- The most common causes of injury were workplace-related (31%) or interpersonal violence (24%).
- Previous ocular surgery, corneal scarring of the visual axis, lens status, hyphema, and vitreous hemorrhage were found to be associated with presenting vision, as measured by the ETDRS chart.

The results show that the majority of participants with open-globe penetrating injuries were of white ethnicity (233, 84%), male (246, 88%), with a median age of 43 years (IQR 30–55 years). The most common causes of injury were workplace-related (31%) or interpersonal violence (24%). Previous ocular surgery, corneal scarring of the visual axis, lens status, hyphema, and vitreous hemorrhage were found to be associated with significant loss of visual acuity.

The study provides relevant information on the spectrum of pathology of patients with open ocular lesions undergoing vitreoretinal surgery. The identified causes of injury and the clinical presentation of the cases will aid in resource planning and training to handle these often challenging surgical cases.

Workplace incidents and interpersonal violence accounted for the majority of eye injuries and fluctuations occurred in the months in which these injuries occur. Hyphema was strongly associated with retinal detachment, more than 50% of hyphema was associated with higher chances of retinal detachment. The cases studied revealed a variety of harm-causing mechanisms, with the work environment being the most common (31%), followed by injuries related to interpersonal violence (24%). Despite these regulations, the results emphasize the need to improve eye protection in the workplace7

Godoy et.al.[8] highlights the main ophthalmologic clinical manifestations in patients with orbital fractures, indicating that one in four patients with maxillofacial trauma also has orbital fractures and concomitant eye injuries. A thorough ophthalmological evaluation after trauma is crucial for the preservation of visual acuity. Prompt ocular examinations may be determinant,

especially in cases with physical findings indicative of visual impairment, afferent pupillary defect, and radiographic imaging revealing extensive orbital fracture.

Among the relevant ophthalmologic clinical manifestations, enophthalmos, diplopia, traumatic hyphema, retinal hemorrhage, amaurosis, chemosis, traumatic optic neuropathy, and retrobulbar hematoma stand out. It is concluded that a thorough ophthalmologic evaluation is essential for the preservation of visual acuity in patients who are victims of facial trauma.[8] .

González Duquesne et.al.[9], addresses pediatric ocular trauma, highlighting its frequency in ophthalmologic emergencies. The study presents a case of blunt ocular trauma successfully managed in the emergency room, resulting in satisfactory visual quality. The treatment of eye trauma, which accounts for about 20% of hospitalizations at the Ramón Pando Ferrer Cuban Institute of Ophthalmology, is challenging due to the complexity of the damage. In many provinces of Cuba, hospitalizations for eye trauma exceed 30%, with 17% of patients experiencing severe visual impairments associated with cognitive deficits.

The clinical case presented in the study highlights the effective management of a 16-year-old patient with blunt trauma to the right eye, resulting in total hyphema. Despite the complications, such as lens subluxation, cataracts, panuveitis, hemovitreous, retinal detachment, and traumatic glaucoma, the approach adopted was crucial to prevent damage to the optic nerve and avoid the resulting visual impairment9.

In 2022, Chang & Cervantes10 conducted a study addressing the clinical and epidemiological characteristics of patients treated for ocular trauma in Panama. After analyzing the data obtained in the emergency room, it was found that trauma at home (45.1%) and in the workplace (39%) were the most common places. The prevalent causal agents were blunt objects (42%), sharps (19%), and chemical burns (18%). The high incidence of fungal keratitis associated with the frequent use of plant objects (36%) and wood (12%) stands out.

The age group most affected by ocular trauma was again men between 30 and 40 years old, predominantly from urban areas, with a higher incidence in the areas of construction and agricultural work, caused mainly by blunt and sharp objects. Of the 208 attendances recorded in the emergency service, six patients had a second attendance for the same condition, resulting in a final sample of 202 cases.

Among these cases, 76.2% occurred in men and 23.8% in women, predominantly in the age group between 25 and 34 years. The structures most frequently involved in ocular trauma and chemical burns were identified as mixed (36%), followed by the cornea (27%), conjunctiva (12.9%), eyelid (2.5%), and sclera (1.5%). Other structures were reported in approximately 20% of the cases10.

Finally, Corso et.al.[11], addresses the management of chemical ocular burns, indicating that these represent about 12% of emergency ophthalmologic visits and require immediate intervention. Burns due to alkali (7.4%) and acid (2.2%) are the most common, being the first associated with more severe injuries and poor prognosis. Clinical treatment varies according to the degree of the injury, with mild lesions treated with topical steroids, cycloplegics, and prophylactic antibiotics for seven days. In more severe burns, the focus is to promote epithelial regeneration and prevent corneal ulceration.

FINAL CONSIDERATIONS

In summary, eye health is a key concern worldwide, affecting millions of people and significantly impacting quality of life. This article highlights some of the most common eye problems faced by the population, from simple refractive errors to more complex conditions such as macular degeneration and glaucoma.

While advances in medical technology have led to more accurate diagnoses and more effective treatments, there are still challenges to be addressed. Accessibility to eye care remains a concern in many regions, and public awareness of the importance of eye health remains crucial.

It is imperative that governments, healthcare professionals, non-governmental organizations, and society at large work together to ensure that everyone has access to appropriate eye care. In addition, education on prevention, early diagnosis, and treatment of eye problems should be widely promoted.

The proper approach to eye trauma requires careful assessment of the extent and severity of the damage, with particular attention to the structures involved. The constant updating and adoption of evidence-based protocols are essential to improve the quality of emergency ophthalmic care and ensure better prognosis.

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