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Eye Emergencies in the Geriatric Population: Single Center Results from 2015-2023

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ABSTRACT

Aim: To evaluate the clinical and demographic characteristics of geriatric patients who apply to the emergency department with ophthalmic complaints, to determine risk factors, design appropriate prevention strategies, and improve existing ones.

Material and Methods: The records of patients aged ≥ 65 years who applied to the emergency department with ophthalmic complaints were evaluated retrospectively. The patients were divided into two groups traumatic and non-traumatic based on their presenting complaints.

Results: The study included two hundred-five patients with a median age of 72 (65-100). Among the patients, 81 (39.51%) were women with a median age of 74 (65-100), and 124 (60.48%) were men with a median age of 71.5 (65-93). One hundred and twenty-four (60.48%) of the patients were admitted for traumatic reasons and 81 (39.51%) for non-traumatic reasons. Of the patients admitted for traumatic reasons, 25 (20.16%) were women and 99 (79.83%) were men; Of the patients admitted for non-traumatic reasons, 56 (69.13%) were women and 25 (30.86%) were men. Falls (24.19%) were the most common in those admitted for traumatic reasons. According to gender, eye traumas were statistically significantly more common in men than in women ($p<0.001$). Blurred vision (19.75%) was most frequently observed in patients admitted for non-traumatic reasons.

Conclusion: While eye emergencies seen in the geriatric age group mostly occur in men and for traumatic reasons, applications in women are mostly made for non-traumatic reasons. Eye emergencies seen in the geriatric age group constitute a significant health problem, regardless of the cause.

Keywords: Geriatric; emergency; trauma; fall; blurred vision.

Geriatrik Popülasyonda Göz Acilleri: 2015-2023 Tek Merkez Sonuçları

ÖZ

Amaç: Acil servise göz şikayetleri ile başvuran geriatrik hastaların klinik ve demografik özelliklerini değerlendirmek, risk faktörlerini belirlemek, uygun önleme stratejilerini tasarlamak ve mevcut olanların geliştirilmesini sağlamaktır.

Gereç ve Yöntemler: Acil servise oftalmik şikayetlerle başvuran ≥ 65 yaş hastaların kayıtları geriye dönük olarak değerlendirildi. Hastalar başvuru şikayetlerine göre travmatik ve travmatik olmayan olarak iki gruba ayrıldı.

Bulgular: Çalışmaya yaş ortancası 72 (65-100) olan iki yüz beş hasta dahil edildi. Hastaların 81'i (%39,51) ortanca yaşı 74 (65-100) olan kadın ve 124'ü (%60,48) ortanca yaşı 71,5 (65-93) olan erkeklerden oluşmaktaydı. Hastaların 124'ü (%60,48) travmaya bağlı nedenlerle, 81'i (%39,51) travmatik olmayan nedenlerle başvuruda bulundu. Travmaya bağlı nedenlerle başvuru yapan hastaların 25'i (%20,16) kadın, 99'u (%79,83) erkekti. Travma dışı nedenlerle başvuru yapan hastaların 56'sı (%69,13) kadın, 25'i (%30,86) erkekti. Travmaya bağlı nedenlerle başvuru yapan hastalarda en sık düşmeler (%24,19) izlendi. Cinsiyete göre göz travmaları, erkek hastalarda kadın hastalara göre istatistiksel olarak anlamlı bir şekilde daha sık izlendi ($p<0,001$). Travma dışı nedenlerle başvuru yapan hastalarda en sık bulanık görme (%19,75) izlendi.

Sonuç: Geriatrik yaş grubunda görülen göz acilleri çoğunlukla erkeklerde ve travmaya bağlı nedenlerle ortaya çıkarken, kadınlarda başvurular daha çok travmatik olmayan nedenlerle yapılmaktadır. Geriatrik yaş grubunda görülen göz acilleri, nedeni ne olursa olsun önemli bir sağlık sorunu teşkil etmektedir.

Anahtar Kelimeler: Geriatrik; acil durum; travma; düşme; bulanık görme.

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INTRODUCTION

Although isolated ocular complaints are rarely life-threatening, they can cause serious short- and long-term morbidity, including permanent vision loss (1). For this reason, emergency diseases of the eye seen in the geriatric (≥ 65) age group, such as blunt or penetrating eye trauma, acute glaucoma crisis, and retinal artery occlusion, should be urgently consulted at the eye clinic.

Frailty is a geriatric syndrome defined as increased vulnerability to stressors, and identifying frail older adults is important as frail individuals are at increased risk for adverse health outcomes including falls, disability, hospitalization, and death. It is reported that worse visual acuity and contrast sensitivity were associated with worse frailty index scores (2).

Eye trauma is a major public health problem and one of the most common preventable causes of visual impairment worldwide (3). Falls are the leading cause of fatal and nonfatal injuries in individuals aged ≥ 65 years. In 2014, 28.7% of older adults reported falling at least once in the previous 12 months, resulting in an estimated 29.0 million falls (4). Blunt eye trauma is most commonly seen in old age as self-inflicted trauma as a result of falling from a bed or vehicle while walking, or falling in the bathroom or sink (5).

Among non-traumatic eye emergencies, red eyes are one of the most common indicators that something is wrong with the eye. Different disorders can cause conjunctival injection, which may lead patients to seek emergency care (6). Sudden vision loss, as well as varying degrees of decrease in visual acuity, may cause patients to seek medical attention. It is important to identify the various causes of non-traumatic eye emergencies to assess when emergency department physicians can comfortably manage a particular case or consult an ophthalmologist to ensure adequate patient care.

Eye emergencies that may cause visual impairment in individuals aged ≥ 65 years, one of the fastest-growing populations, are poorly defined. More detailed information about eye emergencies in individuals aged ≥ 65 years will help identify risk factors, design appropriate prevention strategies, and improve existing ones.

Our aim in this study is to evaluate the clinical and demographic characteristics of geriatric patients who applied to the emergency department with eye and vision complaints.

MATERIAL AND METHODS

The records of patients aged ≥ 65 years who applied to the emergency department of Sivas Cumhuriyet University and were consulted to the ophthalmology clinic between January 2015 and April 2023 were evaluated retrospectively. The study was conducted regarding the ethical standards specified in the 1964 Declaration of Helsinki and ethics committee approval was received from Sivas Cumhuriyet University. Non-Interventional Clinical Research Ethics Committee with the number 2023-11/10 and informed consent was obtained from all individual participants included in the study. Patients whose reason for consultation was evident and whose consultations were concluded by detailed eye examinations by ophthalmologists were included in the study. Patients whose records could not be accessed despite a consultation request in the system or who did not respond to consultation despite their treatments being arranged by the eye clinic were excluded from the study. In addition the demographic characteristics of the patients such as age and gender, the date of admission to the emergency department, and their complaints, and the clinical findings obtained as a result of the eye examination were recorded. Patients were divided into two main groups, traumatic and non-traumatic, according to their presenting complaints. In patients presenting with traumatic eye injury, the causes and type of trauma, as well as the presence of eyelid injury and periorbital fracture as a result of imaging, were noted. Only one eye of patients who suffered trauma to both eyes was included in the study. In patients presenting with non-traumatic ophthalmic complaints, the diagnosis made as a result of eye consultation was noted.

Statistical Analysis

Data distribution and homogeneity of variables were determined using the Kolmogorov-Smirnov test. If the distribution was heterogeneous, variables were shown as median (minimum-maximum). Categorical variables are expressed as numbers and percentages. Pearson Chi-square was used to compare gender and trauma status. P values less than 0.05 were considered to indicate statistical significance. Analyses were performed with IBM SPSS v.22.

RESULTS

Out of a total of 342 patients, 205 patients with a median age of 72 (65-100) were included in the study. Among the patients, 81 (39.51%) were women with a median age of 74 (65-100), and 124 (60.48%) were men with a median age of 71.5 (65-93). One hundred and twenty four (60.48%) of the patients were admitted for traumatic reasons and 81 (39.51%) for non-traumatic reasons. Of the patients admitted due to trauma, 25 (20.16%) were women and 99 (79.83%) were men; Of the patients admitted for reasons non-trauma, 56 (69.13%) were women and 25 (30.86%) were men. When compared in terms of gender, it was determined that eye traumas were statistically significantly more common in men than in women ($p<0.001$) and demographic data of the patients are shown in Table 1. Among patients admitted due to trauma; 30 (24.19%) were due to falls, 30 (24.19%) were due to corneal foreign bodies, 15 (12.09%) were due to in-car traffic accidents, and 11 (8.87%) were wood strikes. Eighty-four (67.74%) patients had blunt eye trauma, 9 (7.25%) patients had penetrating eye injuries, and 27 (21.77%) patients had eyelid lacerations. Glob rupture was observed in 9 (10.71%) of the patients presenting with blunt eye trauma. The most common globe rupture occurred due to wood strikes in 5 (55.55%) patients and due to falls in 3 (33.33%) patients. Orbital computed tomography was performed in 82 (66.12%) patients and periorbital fracture was detected in 38 (30.64%) patients. All trauma causes and types of eye emergencies are demonstrated in Table 2. Among patients admitted for reasons of non-trauma; 16 (19.75%) with blurred vision, 12 (14.81%) with glaucoma attack, 8 (9.87%) with sudden vision loss, and 7 (8.64%) with preseptal cellulitis. All causes of eye emergencies due to non-trauma are demonstrated in Table 3. Generally, the year in which applications were made most frequently was 2021 with 42 (20.48%) patients.

Table 1. Demographics of geriatric patients presenting to the emergency department with eye complaints from 2015 to 2023

		Trauma status		
		Traumatic	Non-traumatic	Total
Gender	Female	25 (20.16)	56 (69.13)	81 (39.51)
n (%)	Male	99 (79.83)	25 (30.86)	124 (60.48)
	Total	124 (60.48)	81 (39.51)	205 (100)

n: Number of patients, %: Column percentage
p=0,001*** x2=49,169 p<0,05* , p<0,01** p<0,001***

Table 2. Demographics of geriatric patients presenting to the emergency department with eye trauma from 2015 to 2023(n=124)

Traumatic	**n (%)**
Cause	
Fall	30 (24.19)
Corneal foreign body	30 (24.19)
Traffic accident	24 (19.35)
• In-car	15 (12.09)
• Out-car	9 (7.25)
Wood strike	11 (8.87)
Branch strike	4 (3.22)
Horn strike	8 (6.45)
Assault	6 (4.83)
Stone strike	3 (2.41)
Piece of glass	2 (1.61)
Chemical eye injury	1 (0.80)
Gunshot wound	1 (0.80)
Pen sting	1 (0.80)
Toy crash	1 (0.80)
Shovel strike	1 (0.80)
Dog attack	1 (0.80)
Type of trauma	
Blunt	84 (67.74)
Globe rupture (5 wood strike, 3 fall, 1 horn strike)	9 (7.25)
Penetrating	9 (7.25)
Chemical eye injury	1 (0.80)
Others (corneal foreign body)	30 (24.19)
Eyelid laceration	27 (21.77)
Periorbital fracture	38 (30.64)

Table 3. Demographics of geriatric patients presenting to the emergency department with non-traumatic eye complaints from 2015 to 2023 (n=81)

Non-traumatic	**n (%)**
Cause	
Blurred vision	16 (19.75)
• Cataract	8 (9.87)
• Intravitreal hemorrhage	3 (3.70)
• Iol subluxation	2 (2.46)
• Cystoid macular edema	2 (2.46)
• No pathology detect	1 (1.23)
Glaucoma attack	12 (14.81)
• Angle-closure	3 (3.70)
• Neovascular	3 (3.70)
• Phacomorphic	2 (2.46)
• Uveitic	2 (2.46)
• Pseudoexfoliative	2 (2.46)
Sudden vision loss	8 (9.87)
• Central retinal artery occlusion	3 (3.70)
• Central retinal vein occlusion	1 (1.23)
• Retinal detachment	2 (2.46)
• Subretinal hemorrhage	1 (1.23)
• Ocular migraine	1 (1.23)
Diplopia	5 (6.17)
Subconjunctival hemorrhage	5 (6.17)
Keratitis	4 (4.93)
Conjunctivitis	4 (4.93)
Preseptal cellulite	7 (8.64)
Shingles	4 (4.93)
Headache	5 (6.17)
Spontaneous corneal perforation	3 (3.70)
Confusion	4 (4.93)
Orbital cellulite	1 (1.23)
Uveitis	1 (1.23)
Endophthalmitis	1 (1.23)
Ptosis	1 (1.23)

DISCUSSION

Early and accurate diagnosis of eye emergencies is extremely important as they can directly threaten vision and cause permanent blindness if left untreated. This study examined the epidemiological characteristics of patients aged ≥ 65 years who applied to our emergency department with eye and vision complaints since 2015. In our study, it was observed that the majority of admissions to the

emergency department were due to falls and the most common applications were for traumatic reasons. While men were the majority in applications for traumatic reasons, women were in the majority for non-traumatic reasons. The most common reasons for application are; falls, corneal foreign body, blurred vision, and traffic accidents. To our knowledge, this is the first study to examine together the traumatic and non-traumatic causes of admissions to the emergency department with ophthalmic complaints in the population aged ≥ 65 years.

Swenor et al reported that older adults with visual impairment are more likely to be prefrail and frail than those without visual impairment. In addition they indicated that visual impairment is an important yet understudied risk factor for frailty. Therefore eye emergencies may cause frailty by causing visual impairment (2).

The causes of traumatic eye emergencies in the geriatric population may vary significantly depending on the population. A study investigating eye injuries caused by consumer products in individuals aged ≥ 65 years in the United States showed that most eye injuries occurred at home and in men, and the most common cause of eye injuries was chemicals. It has been stated that injuries caused by chemicals may be indirectly related to the use of eye medications in individuals ≥ 65 years of age and may be partially caused by pre-existing visual impairment (7). Although traumatic eye emergencies were the majority in our study, chemical eye injury due to lime splash occurred in only one patient.

Falls are a leading cause of eye trauma in individuals aged ≥ 65 years. In a study comparing geriatric and non-geriatric open-globe injuries, it was reported that approximately two-thirds of geriatric globe injuries occurred as a result of falls, which was much more than in the non-geriatric group (8). Similarly, in our study consisting entirely of geriatric patients, one of the most common causes of traumatic eye emergencies was found to be falls. In addition, one-third of the patients diagnosed with globe rupture were caused by falls. The fact that the majority of applications for traumatic reasons are made up of men is a finding consistent with previous studies showing that men are more prone to eye injuries than women (9-11). In a study evaluating fall-related eye trauma between 2006 and 2015, it was revealed that the highest incidence was in the ≥ 65 age group and the geriatric population constituted the majority of the population receiving vision-threatening diagnoses as a result of falls (12). In our study, out of 30 patients who presented with a fall, globe rupture was detected in 3 and periorbital fracture in 18 (both together in 1 patient). This indicates that 66.66% of patients presenting with a fall received a sight-threatening diagnosis. It has been reported that blunt eye trauma due to falls is more common in women in the geriatric age group (13). Unlike our study, men were in the majority in both blunt eye trauma and fall patients. This difference can be explained by the fact that men are more physically active than women in individuals aged ≥ 65 in our country (14). Accidents that occur as a result of visual impairments, as well as chronic diseases, hearing and physical disabilities, are an important public health problem in terms of morbidity and mortality in old age (15). Slippery floors, steps and sharp edges pose a potential danger for eye injuries resulting from falls in individuals aged ≥ 65 years. Individuals aged ≥ 65 years who have previously had low vision for any reason may be more prone to falls. Safety precautions should be taken, especially against risky situations in the home environment, and all individuals aged ≥ 65 years should be given counseling regarding the risk of falling.

In our study, among non-trauma emergency applications; blurred vision, glaucoma attack, sudden vision loss, preseptal cellulitis, subconjunctival hemorrhage, keratitis, and conjunctivitis were listed as the most common causes. Angle-closure glaucoma was detected in 3 of the patients presenting with a glaucoma attack. Advanced age is a well-known risk factor for acute angle-closure glaucoma (16). In a study, it was determined that the incidence of acute angle-closure glaucoma increases exponentially with age and peaks in the 75-79 age group (17). As the world population ages, the rate of acute angle-closure glaucoma among eye emergencies may increase rapidly, and current results show that acute angle-closure glaucoma is one of the first diagnoses that should be considered in geriatric patients presenting to the emergency department with a painful non-traumatic eye. Central retinal artery occlusion (CRAO) is an ophthalmological emergency accompanied by sudden, unilateral, and painless vision loss, most commonly seen in people aged ≥ 60 years. In our study, CRAO was detected in 3 of 8 patients presenting with sudden vision loss, and the patients were referred to an advanced center for hyperbaric oxygen therapy as soon as the diagnosis was made. Subconjunctival hemorrhage, which is frequently encountered in the emergency department, is bright red bleeding between the conjunctiva and sclera. Bleeding, which is common in individuals aged ≥ 65 years without a history of trauma, is noticed after awakening from sleep and is often associated with systemic diseases and primary hypertension (6). In our study, subconjunctival hemorrhage was observed in 5 patients. High blood pressure was detected at the time of diagnosis in 4 of them, and a history of warfarin use was detected in one patient.

The SARS-CoV-2 (COVID-19) pandemic has significantly impacted ophthalmology practices around the world. Many ophthalmological societies have recommended avoiding all treatments other than urgent or emergency care and limiting hospital exposure to reduce the risk of SARS-CoV-2 transmission (18). It was determined that there was a significant decrease in the number of patients aged ≥ 65 years in emergency department visits related to ocular emergencies during the pandemic. This was explained by the fact that the population aged ≥ 65 years is the most vulnerable group to COVID-19 and is also the age group where the awareness campaign and health measures have had the greatest impact (19). The first COVID-19 case in Turkey was seen on March 11, 2020, and a curfew was declared for those aged ≥ 65 years on March 20, 2020. The national partial curfew, declared after the normalization period in the summer of 2020, started on November 18 and continued until 28.02.21. Partial isolation was declared between 14-28.04.21, full isolation was declared between 29.04-16.05.21, and gradual normalization was implemented as of 17.05.21 (20). In our study, when we look at the distribution of applications made for both traumatic and non-traumatic reasons by years, there was an increase,

contrary to expectations, in 2021, when the pandemic was most intense in Turkey, as in the rest of the world. We think that this situation occurred as a result of the applications made to emergency services, with a significant decrease in the number of outpatient clinic examinations during the pandemic period. With the normalization of pandemic measures and the transition to normal life, 2022 has become the second year in which the most frequent applications to the emergency department were made, in parallel with the expectation of an increase in patient mobility. The distribution of emergency eye cases admitted to emergency departments from 2015 to April 2023 by year was demonstrated in Figure 1.

In our study, the majority of patients consulted from the emergency department to the eye clinic were patients admitted for traumatic reasons, while the patients who suffered eye trauma were largely male. While the most common causes of eye trauma were falls and corneal foreign bodies, the most common non-traumatic causes were blurred vision and glaucoma attacks. While the majority of blunt eye traumas were caused by falls, the majority of the patients were men, unlike the literature. The limitations of this study are that there is only data from a single center, the small number of patients, and the fact that the patient's vision levels were not examined at the time of admission and after treatment. Additionally, we did not calculate an ocular trauma score in traumatic patients, so the patients were not classified anatomically.

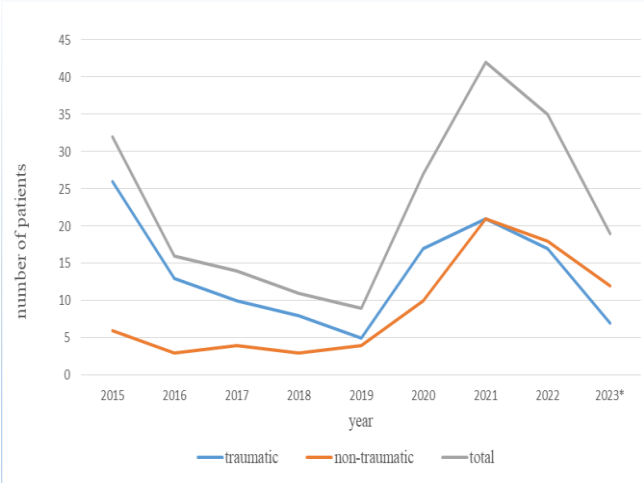

Figure 1. Distribution of eye emergencies in geriatric patients admitted to emergency departments from 2015 to April 2023*

CONCLUSION

Ophthalmological emergencies vary widely in the geriatric population, which has an extremely high need for quality vision in addition to physical, mental, and systemic comorbidities. As a result, eye emergencies constitute an important health problem for this age group, regardless of the reason, whether traumatic or non-traumatic. We believe that the data from our study will provide a good basis for identifying risk factors, designing appropriate prevention strategies, and improving existing ones in individuals aged ≥ 65 years who are admitted to the hospital for eye emergencies. Future studies involving larger numbers of patients are needed on this subject.

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