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OPHTHALMOLOGICAL EXAMINATIONS IN ELBISTAN REGION AFTER KAHRAMANMARAS EARTHQUAKE
KAHRAMANMARAŞ DEPREMİ SONRASINDA ELBİSTAN BÖLGESİNDEKİ GÖZ MUAYENE BULGULARI

Zekeriya CETİNKAYA[1], Esra ÖZTÜRK[2]

[1] *Kayseri State Hospital, Department of Ophthalmology, Kayseri, Türkiye*
[2] *Elbistan State Hospital, Department of Ophthalmology, Kahramanmaraş, Türkiye*

ABSTRACT

The aim of this article was to determine the types of eye diseases and injuries sustained during the Kahramanmaraş-Elbistan earth quake on February 6, 2023. This was a hospital-based retrospective and descriptive research study of patients presenting to the Elbistan State Hospital after the earth quake. Patients' medical records were retrospectively reviewed and analyzed for age, sex, and reason for hospitalization. Information on each patient's chief complaint, diagnosis, and glasses and contactlenses provided was also reviewed. Between February 6 and March 31 2023, there were 826 cases of earth quake victims with ophthalmological complaints who visited the Elbistan State Hospital. The mostcommon reason for admission was the need for glasses (475/826 [57.5%]). Patients frequently presented with redeye (346/826 [41.8%]). The most frequent ocular diagnosis was refractive disorder (442/826 [53.5%]). One of the most common diagnoses among people affected by the earth quake was conjunctivitis (251/826 [30.4%]). Immediate treatment of ocular trauma is critical for preventing blindness. This study was intended to determine the types of ocular injuries and provide data on earth quake-related ocular morbidity during the Kahramanmaraş - Elbistan earth quakes. Characterizing the burden of earth quake-related eye trauma will facilitate the planning of services in the event of a future earth quake in Türkiye or in countries at similar risk of natural disasters.

Keywords: Earthquakes, natural disaster, ocular vision.

ÖZ

Bu makale 6 Şubat 2023 Kahramanmaraş-Elbistan depreminde meydana gelen göz hastalıkları ve yaralanmalarının türlerini belirlemek amacıyla hazırlanmıştır. Kahramanmaraş depreminden hemen sonra Elbistan Devlet Hastanesi'ne başvuran hastaların göz hastalıkları ile ilgili verilerinin değerlendirildiği geriye dönük olarak ve tanımlayıcı nitelikte bir çalışmadır. Hastaların tıbbi kayıtları geriye dönük olarak incelenerek yaş, cinsiyet, başvuru şikayetleri ve tanıları analiz edildi. Her hastanın asıl şikayeti, tanısı ve ihtiyaç duyulan gözlük ve kontakt lenslere ilişkin verilerde tespit edildi. 6 Şubat - 31 Mart 2023 tarihleri arasında Elbistan Devlet Hastanesi'ne göz hastalıkları ile ilişkili şikayet ile başvuran 826 depremden etkilenmiş birey vardı. En sık başvuru nedeni gözlük ihtiyacıydı (475/826 [%57,5]). Hastalar sıklıkla gözde kızarıklık şikayeti ile başvurdu (346/826 [41.8%]). Hastaların en sık kırma kusuru tanısı ile başvuru yaptığı tespit edildi (442/826 [%53,5]). Depremden etkilenip oküler rahatsızlık şikayeti ile hastaneye başvuran kişilerde en sık görülen tanılardan biri konjonktivitti (251/826 [%30,4]). Göz travmalarının acil tedavisi körlüğün önlenmesi açısından kritik öneme sahiptir. Bu çalışma, Kahramanmaraş - Elbistan depreminde göz yaralanmalarının türlerini belirlemek ve depreme bağlı göz hastalıkları hakkında veri sağlamak amacıyla yapıldı. Depreme bağlı göz travmalarının yükünün karakterize edilmesi, Türkiye'de veya benzer doğal afet riski taşıyan ülkelerde gelecekte yaşanabilecek depremlerde hizmetlerin planlanmasını kolaylaştıracaktır.

Anahtar kelimeler: Deprem, doğal afet, oküler görme.

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Corresponding Author: Ophthalmologist Specialist, Dr. Zekeriya ÇETİNKAYA, zekeriyacetinkaya@hotmail.com.tr, 0000-0002-8885-5788,Kayseri State Hospital, Department of Ophthalmology, Kocasinan, Kayseri, Türkiye.

Author: Ophthalmologist Specialist, Esra ÖZTÜRK, esraozturk2110@gmail.com, 0000-0003-4559-4466

INTRODUCTION

On February 6, 2023, Türkiye was hit by two of the most catastrophic earthquakes of the last century. In the early hours of February 6, the city of Kahramanmaraş in Türkiye experienced the first earthquake, measuring 7.7 on the Richter scale. A second earthquake measuring 7.6 on the Richter scales truck the same region.[1,2] In natural disasters, trauma is generally unpredictable, and the nature of ocular injury can vary widely depending on the incident scenario. Understanding of the nature and type of eye injuries that ocur during natural disasters such as earthquakes will help to guide the planning of eye care services for future natural disasters. Ocular trauma remains a significant cause of visual impairment world wide, with more than half a million blinding injuries occurring every year.[3] Knowledge of the causes of ocular injury can aid in the developing of prevention strategies and the optimizing of management capacity. As our country is in an earthquake zone and earthquakes similar to the 2023 earthquake are high lyprobable, we believe that this study will be a valuable contribution to the development of health services. At the epicenter of the disaster, Kahramanmaraş Elbistan State Hospital in Türkiye provided critical multidisciplinary support. The extent of ocular trauma from the recent earthquakes in Elbistan has not been described. The aim of this article was to determine the types of eye injuries sustained in the Kahramanmaraş-Elbistan earthquake.

MATERIALS AND METHODS

All patients who presented to Kahramanmaraş Elbistan State Hospital with eye problems between February 6 and March 31, 2023, after the great earthquake, were retrospectively searched in the hospital's database. We analyzed the patients' clinical data and determined the distribution of age, sex, chief complaints, and diagnoses, as well as the number of eye drops, glasses, and contact lenses prescribed. Earthquake-related ocular traumas and general eye problems without trauma were assessed separately.

Ocular trauma included globe injuries, orbital fractures, and soft tissue injuries. This was a hospital-based retrospective and descriptive research study of patients presenting to the Elbistan State Hospital after the earthquake.

Statistical Analysis

Statistical analyses were performed using descriptive methods and SPSS 24.0 (Statistical Package for the Social Sciences; IBM Corp, Armonk, NY, USA). Categorical variables are presented as frequencies and percen tages, and continuous variables as mean, standard deviation (SD).

RESULTS

After the earthquake, between the 6th of February 2023 and the 31st of March 2023, 826 victims of the earthquake who had ocular complaints applied to the Kahramanmaraş Elbistan State Hospital. In total, we provided ophthalmic care to 826 patients (males, 428; females, 398; age range, 0-91 years; mean [SD] age, 47 [20,4] years). Adults in the age group between 40 and 60 years were the most frequently affected age group (Table 1).

Most patients came to the hospital to replace items lost in the disaster: 475 individuals (57.5%) for eye glasses, 92 (11.1%) for eye drops and 39 (4.7%) for contact lenses (Table 2).

Of the diagnoses we identified, 442 (53.5%) were refractive disorders, including myopia and hyperopia. Presbyopia 72 (8.7%) was a common ocular disease (Table 3).

Dry eye was the condition for which eye drops were most frequently administered (53/826, or 6.4%), followed by glaucoma (39/826, or 4.7%), and cataracts (31/826, or 3.8%). The types and rates of diagnosis are shown in Table 3. A total of 29 patients were admitted with eye lid lacerations. Of these, 12 were isolated lid lacerations, while the remaining 17 patients also had injuries to the surrounding ocular tissues (Table 3-4-5-6).

Table1. Age of Patients

		Frequency	%
1	0-4 age	19	2.3
2	5-10 age	39	4.7
3	11-20 age	89	10.8
4	21-30 age	93	11.3
5	31-40 age	88	10.7
6	41-50 age	140	16.9
7	51-60 age	178	21.5
8	61-70 age	102	12.3
9	71-100 age	78	9.5
Total		826	100.0

Table 2. Main complaints of patients affected by the earthquake

Present Complaint	**Number**	% *
Lostglasses	475	57.5
Losteyedrops	92	11.1
Lostcontact lens	39	4.7
Foreign body sensation	53	6.4
Epiphora	37	4.4
Redeye	346	41.8
Blurred vision	123	14.8
Lidlaceration	29	3.5

* Percent age expressed compared to total number of patients Somepatients had more than one main complaint.

DISCUSSION

Earthquakes can affect a largerarea in a shorter period of time, resulting in loss of life and property, compared to other natural disasters such as floods, avalanches, and landslides.[4] The burden of ocular trauma resulting from the recent earthquakes in Elbistan has not been described.

In this study, we analysed data from 826 adult patients who had been affected by an earthquake. The meanage of the participants was 43.56±20.4 years, and there were more male patients than female patients. In the Kahramanmaraş - Elbistan earthquake of 6 February

Table 3. Diagnosis of patients affected by the earthquake (Glaucoma – Retina - Other anterior segment diseases)

Diagnosis		**Number**	**% ****
Trauma-related	Retinal detachment	2	0.2
	Vitreous hemorrhage	1	0.1
	Glaucoma	39	4.7
	Retinal vascular occlusion	3	0.4
	Macular degeneration	10	1.2
	Other retinal disorders	6	0.7
	Diabetic retinopathy	12	1.5
Non-traumarelated	Dryeye	53	6.4
	Iridocyclitis	11	1.3
	Cataract	31	3.8
	Posterior capsule opacification	1	0.1
	Refractive disorder	442	53.5
	Presbyopia	72	8.7

** Percent age expressed compared to total number of patients
Somepatients had more than one main diagnosis.

Table 4 . Diagnosis of patients affected by the earthquake (Cornea – Conjunctiva - Sclera)

Diagnosis		**Number**	**% ****
Trauma-related	Sub-conjunctival hemorrhage	6	0.7
	Conjunctival incision	4	0.5
	Conjunctival foreign body	5	0.6
	Corneal foreign body	20	2.4
	Corneal abrasion	7	0.8
	Corneal perforation	4	0.5
	Scleral perforation	1	0.1
Non-traumarelated	Conjunctivits	251	30.4
	Cornealulcer	2	0.2
	Keratitis	12	1.5
	Corneal scar-Opacity	1	0.1
	Scleritis	1	0.1
	Episcleritis	2	0.2
	Pterygium	6	0.7

** Percent age expressed compared to total number of patients
Some patients had more than one main diagnosis.

Table 5. Diagnosis of patients affected by the earthquake (Periorbital eyes and eye lids)

Diagnosis		**Number**	**% ****
Trauma-related	Lid lacerations	29	3.5
	Orbital bone fracture	8	1.0
	Diplopia	1	0.1
	Cellulitis	1	0.1
	Ptosis	1	0.1
Non-traumarelated	Epiphora	37	4.5
	Dacrioadenitis	4	0.5
	Chalazion	14	1.7
	Blepharitis	6	0.7
	Dermatitis	2	0.2
	Strabismus	3	0.4

** Percent age expressed compared to total number of patients
Some patients had more than one main diagnosis.

Table 6. Diagnosis of patients affected by the earthquake (Multiple Injuries)

Diagnosis	**Number**	**% *****
Lid lacerations with Orbital bone fracture	8	47.1
Lid laceration with Corneal Perforation	4	23.5
Lid laceration with Conjunctiva lincision	1	23.5
Lid laceration with Scleral Perforation	1	5.9

*** Percent age distribution of patients with eye lid lacerations.
Some patients had more than one main diagnosis.

2023, During the 54 days following the earthquake, a total of 862 earthquake victims came to the Kahramanmaraş Elbistan State Hospital with complaints of eye-related conditions.

This is the only comprehensive study on extensive ocular injuries related to the Kahramanmaraş–Elbistan earthquake. This research provides a reference and will assist in identifying and planning of the type of intervention needed for effective management of eye damage and as well as for disaster management infuture earthquakes.

While the primary burden of earthquake-related trauma was orthopaedic,[5,6] eye care services are also important in the acute phase of a natural disaster, as ocular injuries can become sight-threatening if not treated in a timely manner.

Most of the literature shows that eye injuries are more common in males.[7,8] Similarly, 51.8% of the participants in this study were male.

Corneal perforation was seen in 4 victims, scleral perforation in 1 and orbital fracture in 8. Penetrating rupture of the globe was seenl ess frequently in comparison with fractures. This is probably due to the natural protective reflex of people to cover their eyes and face in the event of a disaster.[9]

Thirty-nine (39/862 [4.7%]) glaucoma treated patients applied to the hospital for a prescription for eye drops. Many victims with conditions such as glaucoma were unable to use eye drops for a while due to lack of medication after earthquake. For this reason, elevated IOP was observed in these patients. Increased IOP is a significant risk factor for the progression of glaucomatous optic neuropathy and can be dangerous for these patients.[10]

Problems with pre-existing ocular conditions were common due to the loss of glasses, contact lenses, and eye drops. 475/862 [57.5%]) patients were admitted for glasses, 92/862 [11.1%]) for eye drops and 39/862 [4.7%]) for contact lenses.

Another serious problem was the loss of contact lens cases and solutions, as many of the earthquake survivors tried to wear their contact lenses without proper care. Twelve (12/862 [1.5%]) of the visitors to the hospital were treated for corneal keratitis. It is not clear whether these cases of keratitis were caused by contact lenses. The use of expired contact lenses is a known risk factor for contact lens-related conditions, such as bacterial corneal ulcers.[11] It is worth remembering that there may be a need for contact lenses and protective materials in future disasters.

The uncorrected vision of older people with myopia can lead to decreased postural stability,[12] reduced ability to perform daily activities[13] and an increased fear of falling.[14] 57.5% of patients who came to Elbistan State Hospital with ocular problems after the earthquake sought prescriptions for their lost eye glasses. Many elderly people cannot read or watch television unless they wear glasses. Lack of glasses may lead to a deterioration in the individual's psychological condition, as it prevents them from being aware of their surroundings. At the same time, because they cannot see their surroundings, they do not have sufficient information about their environment, which can even be life-threatening.

In the aftermath of the disaster, a reduction in visualacuity resulted in a decrease in quality of life for those who had lost their glasses. Failure to correct refractive errors is associated with a significant reduction in vision-related quality of life.[15] It should not be forgotten that glasses are very important to prevent injuries caused by obstacles and hazards in the environment after an earthquake. As a result, we now believe that replacing drops and providing refractive care are the primary concerns in such situations and that it is essential to provide these needs in such emergency situations.

CONCLUSION

Penetrating injuries or rupture of the globe were rare in this study because patients with serious ocular injuries may have been referred directly to tertiary centers by volunteer doctors or field health workers. Another reason for the low number of serious eye injuries may be that these patients may have suffered severe crush injuries and may not have lived long enough to survive. There fore, the main needs of the patients were centered on pre-existing chronic conditions such as cataracts, dry eye, conjunctivitis, glaucoma, diabetic retinopathy, and retinal diseases.

This study retrospectively analysed the records of patients registered in the emergency and ophthalmology departments of Elbistan State Hospital, However, some patients may not have been recorded due to the chaos, confusion and numerous repeated after shocks, which may have introduced some bias. However, in an emergency situation, this may be the only way to conduct a study. Never the less, by providing data on earthquake-related ocular morbidity, this study may be useful for future prospective population-based studies.

Ocular morbidity, either in the form of ocular injury or disease, was common among earthquake survivors. Earthquakes may affect human populations in the future and their impact is unpredic table. Information collected after a particular earthquake may help save lives in the event of a subs equent earthquake.

Ethics Committee Approval: Ethics committee approval was received for this study from the Medical Research Ethics Committee of Kahramanmaraş Sütçü İmam University (Date: 19 July 2023, Number: 03–2023/05). This study complies with the principles of the Declaration of Helsinki.

Informed Consent: Written and verbal consent was obtained from 826 participating in the study.

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