

How much did the February 6 earthquakes affect a distant hospital?

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ABSTRACT

Aims: In the earthquakes that took place in Kahramanmaraş on 06.02.2023, a large number of casualties and injuries were observed. Organizations and healthcare personnel providing healthcare services in the earthquake regions have significantly lost their functions and there have been disruptions in the provision of healthcare services. In this study, we analyzed the patients who applied due to being affected by the earthquake in Kastamonu, one of the provinces far from the epicenter of the earthquake.

Methods: The records of 135 patients who admitted to Kastamonu Training and Research Hospital Emergency Medicine Clinic with the diagnosis of earthquake damage between 7-16 February 2023 were examined. They were divided into two groups: patients with trauma and other non-traumatic complaints. Demographic data, complaints, requested tests, final diagnoses, consultation and hospitalization status of the patients were recorded.

Results: While 50 patients applied with complaints of trauma caused by the earthquake, 85 patients applied to the emergency department due to diseases other than trauma. 10 of these patients were hospitalized and the others were discharged. It was observed that soft tissue trauma was the most common diagnosis in applications for trauma reasons, and upper respiratory tract infection was the most common diagnosis for non-traumatic reasons.

Conclusion: In our study, since we were a hospital far from the center of the earthquake, there were no patient applications on the first day, and since the patients arrived over the days, no problems arose during the triage and intervention stages.

Keywords: Earthquakes, emergency medicine, trauma

INTRODUCTION

Turkey is one of the countries where earthquakes are common and many large earthquakes have occurred until today. On 06.02.2023, at 04:17 and 13:24 local time in Türkiye, two earthquakes with a magnitude of Mw 7.7 and Mw 7.6 occurred, the epicenters of which were Pazarcık (Kahramanmaraş) and Elbistan (Kahramanmaraş), respectively. Both earthquakes were felt very strongly in Kahramanmaraş, Hatay, Adıyaman, Gaziantep, Malatya, Kilis, Diyarbakır, Adana, Osmaniye, Şanlıurfa and Elazığ, causing loss of lives and heavy damage.¹ Aftershocks, which were seen in large numbers, also increased the number of damage and injured and became a reason for the people to leave the region.

In the two-month period after the earthquake, the death toll was declared as more than 50 thousand and it is estimated that this number will increase even more. Although the number of injured could not be determined exactly, apart from injuries, the quality of life of many people was

obviously affected due to homelessness and harsh weather conditions. Organizations providing health services and health personnel in earthquake regions have also lost their functions to a great extent and there have been disruptions in the provision of health services. For these reasons, patients were attempted to be transferred to hospitals in the provinces that were not affected by the earthquake, and the injured who left the earthquake area applied to hospitals in other provinces.

Kastamonu is a province located 707 km from the epicenter of the earthquake, but due to the large number of injured and homeless people, many people were transported here by their own means and by the state. After the earthquake, hospitals in the nearby provinces usually cover the majority of the injured, but the excessive patient load seen after the 6 February earthquakes also affected very distant provinces. In this study, we analyzed the patients who presented due to earthquake effects in Kastamonu, which is one of the distant provinces.

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METHODS

The study protocol was approved by the Local Ethics Committee of Kastamonu University Medical Faculty (Date: 19/04/2023, Decision No: 2023-KAEK-35). Patients who presented to the hospital in the 10-day period after the earthquake were retrospectively screened from the hospital automation system. The records of 135 patients who presented to the Emergency Medicine Clinic of Kastamonu Training and Research Hospital between 7-16 February 2023 with the diagnosis of earthquake damage were examined. The patients were divided into two groups as those with trauma and non-traumatic complaints. Patients' demographic data, complaints, ordered investigations, final diagnosis, consultation and hospitalization status were recorded. All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. The obtained data were entered into Microsoft Excel 2007 (Microsoft Corporation, Redmond, CA) and analyzed using SPSS (v20; IBM, Armonk, NY). Descriptive statistics were given as number (n), percentage (%) and mean.

RESULTS

The first presentation to our hospital due to damage from the earthquake was on February 7. It was seen that a total of 135 patients presented in the 10 days between 7-16 February. Of the patients, 81 were female and 54 were male, and the mean age was 41 years. While 132 of the patients presented to our hospital on their own, three patients were brought to the emergency room by ambulance from places such as dormitories and nursing homes in our city where the injured people were placed after the earthquake. Demographic data of the patients are shown in Table 1.

	Trauma (n=50)	Non-traumatic (n=85)
Female	32 (64%)	49 (58%)
Male	18 (36%)	36 (42%)
Mean age (years)	41.37	
Presentation		
Ambulance	2 (4%)	1 (1.1%)
Outpatient	48 (96%)	84 (98.9%)

While presentations due to trauma were more commonly observed in the first days after the earthquake, admissions for other reasons increased in the following days. The reasons for the presentations of the patients according to the days are shown in Figure.

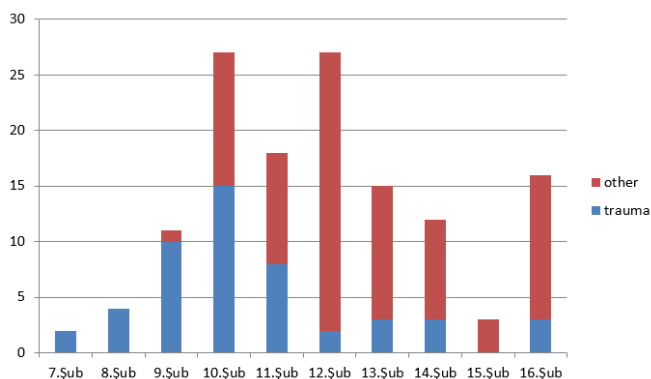


Figure. Analysis of patients admitted with trauma and other reasons after the earthquake by days

While a total of 50 patients presented with the complaint of trauma caused by the earthquake, 85 patients presented to the emergency department due to diseases other than trauma. Ten of these patients were hospitalized and the others were discharged. It was observed that soft tissue trauma was the most common diagnosis in trauma-related admissions, and upper respiratory tract infection was the most common among non-traumatic causes. Complaints of admission, diagnoses, consultation and hospitalization status are shown in Table 2.

	Trauma (n=50)	Non-traumatic (n=85)
Extremity fractures	7 (14%)	-
Lumbar fractures	2 (4%)	-
Soft tissue trauma	41 (82%)	-
Pneumonia	-	5 (5.8%)
Upper respiratory tract inf.	-	34 (40%)
Drug supplement	-	6 (7%)
Other	-	40 (47%)
Consultation		
Orthopedics	7 (14%)	-
Neurosurgery	2 (4%)	-
Thoracic diseases	-	3 (3.5%)
Cardiology	-	1 (1.1%)
Internal medicine	-	1 (1.1%)
Gynecology	-	2 (2.3%)
Psychiatry	-	1 (1.1%)
Hospitalization		
Orthopedics	4 (8%)	-
Neurosurgery	1 (2%)	-
Intensive care unit	-	1 (1.1%)
Thoracic diseases	-	2 (2.3%)
Internal medicine	-	1 (1.1%)
Psychiatry	-	1 (1.1%)

The investigations ordered for the patients who presented to the emergency department with the diagnosis of damage from the earthquake are also shown in Table 3. While investigations were ordered in almost all of the trauma patients (94%), 67% of the patients who presented for non-traumatic reasons were not ordered any examination.

	Trauma (n=50)	Non-traumatic (n=85)
X-ray	30 (60%)	7 (8.2%)
CT	18 (36%)	9 (10.5%)
USG	1 (2%)	1 (1.1%)
Blood	12 (24%)	20 (23.5%)
No order	3 (6%)	57 (67%)

DISCUSSION

Earthquake is a large scale natural disaster that affects a large population in a wide geography and has medical, economic and social consequences. Two earthquakes with a magnitude of 7.7 and 7.6 Mw, which occurred in Pazarcık and Elbistan districts of Kahramanmaraş on February 6, 2023, caused loss of lives and destruction in 11 provinces in the vicinity. The

earthquake caused high levels of loss of lives and properties in 11 provinces including Adana, Adiyaman, Diyarbakir, Elazığ, Gaziantep, Hatay, Kahramanmaraş, Kilis, Malatya, Osmaniye and Şanlıurfa.²

Kastamonu is a province quite far from Kahramanmaraş, the epicenter of the earthquake. However, the high number of injuries due to the earthquake caused people to go to almost all provinces of the country, as staying in the earthquake zone became because of the aftershocks and housing problems. It is observed that 135 patients presented to the Kastamonu Training and Research Hospital Emergency Service in the first 10 days after the earthquake. The number of patients admitted daily has increased by around 13-14 on average, but since the average number of admissions to the emergency service is already 500-600, it seems that there is no an increase that will affect the intensity of the emergency service.

One of the largest studies to investigate earthquake trauma was conducted after the Hanshin-Awaji Earthquake in Japan. Examination of the presentations made to 95 hospitals revealed that the most common traumas caused by earthquakes were extremity and spine traumas. Soft tissue trauma was reported in 35%.³ In our study, the most common reason for presentation in trauma-related admissions was extremity injuries, and soft tissue trauma was diagnosed in the vast majority of these patients (82%). Only seven patients had a fracture in the extremity, and two patients had a lumbar fracture. Ten percent of the patients admitted with trauma were hospitalized. This result confirms the opinion that cases with major trauma refer to closer centers due to the distance of Kastamonu province from the earthquake epicenter.

Chest trauma was the most common cause of death from trauma in the young population.⁴ However, in a study conducted after the 1999 earthquake, the highest rate of post-earthquake deaths was due to abdominal trauma by 27.3%.⁵

In another study revealing the problems experienced in the emergency services after the earthquake, it was reported that 70.4% of the injured who were brought to the emergency department after the earthquake had simple minor injuries that were not of vital importance.⁶ In our study, there were no life-threatening patients admitted due to trauma because of the distance of our province.

In a study conducted after the Van earthquake, it was reported that 754 (47.7%) of 1582 patients who presented to the emergency department with earthquake-related injuries were admitted on the 1st day of the earthquake.⁷ It was reported in the same study that while 149 of the patients were referred to hospitals outside the province, 301 were admitted to the wards and the most hospitalizations (n=84, 28%) were in the orthopedics and traumatology clinic. In the Gujarat earthquake in India, orthopedic injuries were prominent in 234 (51%) of the 534 injured.

In our study, while no patient was admitted on the first day of the earthquake, the first patient was presented on 7 February. In the first days of the earthquake, presentations were mostly due to trauma, but in the following days, health problems such as struggling to survive outside and other diseases due to winter conditions, and the inability of those with chronic diseases to take their medications were also observed. Of the 135 patients who presented to us, 50 were due to trauma and 85 were due to other non-traumatic diseases. In our study, the highest rate of hospitalization was in the orthopedics and traumatology clinic with 8%. The lower rate of hospitalization to the orthopedics

and traumatology clinic in our study than in the literature can be explained by the higher number of patients presenting for non-traumatic reasons.

Considering the presentations with non-traumatic reasons, it was observed that 34 (40%) patients presented with upper respiratory tract symptoms and were discharged with a prescription. The winter season, when the earthquake occurred, increased the incidence of such diseases due to the fact that people stayed in cold weather for a long time as a result of the destruction and low self-care. Hospitalization was made for five of the 85 patients who presented for reasons other than trauma, and this number did not create much of a burden for our hospital.

X-ray was ordered for 30 patients and computed tomography for 18 patients during the diagnosis processes of patients who applied due to trauma. The vast majority (67%) of the patients who applied for non-traumatic reasons were examined and prescribed on an outpatient basis without ordering an investigation.

One of the most important problems experienced after major earthquakes is that the panic and uncertainty in the earthquake region cause disruptions in the first response and triage process, and as a result, the emergency services can be exposed to a patient load far above their capacity.⁹ In our study, since we were a hospital far from the earthquake center, there were no patient admissions on the first day, and there was no problem in the triage and intervention stages, as the patients came in days. The records of the persons affected in such disaster events should also be kept properly. Necessary sensitivity has been shown in this regard.

In another study that analyzed the lessons learned from the Marmara and Van earthquakes, it was emphasized that the number of deaths and injuries was related to the adequacy of preparedness and early intervention rather than the severity or magnitude of the earthquakes.¹⁰ Therefore, adequate preparations must be made in all clinics, especially emergency services.

CONCLUSION

Our country is in a geography where earthquakes are frequent and the probability of recurrence of such disasters is quite high. It is very important to raise awareness against the number and variety of injuries that may occur after an earthquake, as well as measures such as building the structures on solid ground and resistant to earthquakes. It is also obvious that our health system and emergency services, which are the units that will make the first interventions, should be developed on disaster medicine and the trainings on this subject should gain continuity.

ETHICAL DECLARATIONS

Ethics Committee Approval: The necessary approval was received from the Kastamonu University Clinical Researches Ethics Committee (Date: 19.04.2023, Decision No: 2023-KAEK-35).

Informed Consent: The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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