

Disaster Plan of Hacettepe University Hospital in Turkey: A Hospital Emergency Department Triage Drill

Hacettepe Üniversitesi Hastanesinin afet planı: Bir hastane acil servis triaj tatbikatı

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SUMMARY

Objectives: The practice of disaster triage in the emergency department (ED) was one of the biggest problems for hospitals during a disaster. The aim of this study was to determine the accuracy, and total drill period of a disaster drill simulated by a mock explosion.

Materials and Methods: Hacettepe University Hospital, with a 1150-bed capacity, is one of the largest hospitals in Ankara, Turkey's capital city. The ED disaster triage drill was conducted according to Hacettepe University Hospital's Disaster Plan Book on June 15th, 2004. Hacettepe University Hospital's Triage Tag which were prepared in a double-sided format both in Turkish and English were used in drill. The ED triage drill was performed following a mock explosion scenario. A total of 35 volunteers took part in this drill (emergency physicians (EP), nurses, paramedics as well as 19 other hospital personnel as patients and patients' families). Triage training were given to all of the volunteers two weeks ago. Before the drill, the front part of the ED was set up as triage area and the ED was separated into 4 areas (1. red, 2. yellow, 3. green, 4. black). One of the EPs was charged in triage area, one of them in red area, one of them in yellow area, one of them in green area and one emergency nurse was charged in black area. After the drill finished, the time of the drill and accuracy of the triage were documented and compared to other studies.

Results: All patients were arrived by different vehicles to the hospital. All patients were evaluated one by one in the triage area by an EP and were then taken to a different, suitable location for initial stabilization in the ED. All patients were evaluated again and their management were performed by other physicians. The ED triage drill was completed in a shorter time (8 minutes) than the prior drills performed in other studies (45 min to 2 hours) and showed a higher triage accuracy (100%) than has been reported in other studies (55% to 75%).

Conclusion: ED Triage drill studies play a critical role in determining hospitals' sufficiency of preparations for a disaster.

Key words: Disaster; disaster plan; drill; hospital; triage.

ÖZET

Giriş: Afet zamanlarında acil servis'lerdeki (AS) afet triajı uygulaması, hastaneler için en büyük problemlerden birisidir. Bu çalışmanın amacı, bir hastane AS afet triajı tatbikatının başlangıç değerlendirilmesindeki doğruluğu ve zamanlamasını saptamaktır.

Gereç ve Yöntem: 1150 yatak kapasiteli Hacettepe Üniversitesi Hastaneleri, Türkiye'nin başkenti Ankara'nın en büyük hastanelerinden birisidir. AS afet triajı tatbikatı 15 Haziran 2004 tarihinde "Hacettepe Üniversitesi Hastane Afet Planı Kitabı'na" uygun olarak gerçekleştirildi. Tatbikatta bir tarafı Türkçe bir tarafı İngilizce olarak hazırlanmış olan Hacettepe Üniversitesi Hastaneleri Triaj Kartları kullanıldı. AS afet triaj tatbikatı için bomba patlaması senaryosu kullanıldı. Tatbikatta toplam 35 gönüllü görev aldı (acil tıp doktoru, hemşireler, paramedikler, hasta ve hasta yakını olarak 19 hastane personeli). Tatbikattan iki hafta önce gönüllülerin hepsine triaj eğitimi verildi. Tatbikat öncesinde AS önü triaj alanı olarak hazırlandı ve AS içi dört farklı alana ayrıldı (1. kırmızı, 2. sarı, 3. yeşil, 4. siyah). Bir acil tıp doktoru triaj alanında, bir acil tıp doktoru kırmızı alanda, bir acil tıp doktoru sarı alanda, bir acil tıp doktoru yeşil alanda ve bir acil hemşiresi siyah alanda görevlendirildi. Tatbikat bittiğinde, tatbikatın zamanlaması ve triajın doğruluğu değerlendirildi ve diğer çalışmalarla karşılaştırıldı.

Bulgular: Hastane acil servisindeki her hastanemize farklı araçlarla ulaştırılır. Bütün hastalar triaj alanında bir acil tıp doktoru tarafından teker teker değerlendirildikten sonra AS içindeki başlangıç stabilizasyonları için uygun olan farklı alanlara

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alındılar. Tüm hastalar yeni yerlerindeki görevliler tarafından tekrar değerlendirildi ve tedavileri planlandı. AS triaj tatbikatı daha önce yapılmış olan diğer çalışmalardaki tatbikatlarından (45 dakika - 2 saat) daha kısa sürede (8 dakika) tamamlandı ve tatbikatta daha önce raporlanmış olan diğer çalışmalardaki tatbikatlarından (%55 - %75) daha yüksek triaj doğruluğu saptandı (%100).

Sonuç: AS afet triaj tatbikat çalışmaları, hastanelerin afetler için yeterli hazırlığı yapıp yapamadıklarının görebilmeleri açısından hayati role sahip olan çalışmalardır.

Anahtar sözcükler: Afet; hastane afet planı; tatbikat; triaj.

Introduction

In recent years, tens of thousands of people have died or have been injured from disasters in Turkey. Most of these deaths and injuries were due to a lack of disaster preparedness, both theoretical and practical. Disasters are one of the most devastating problems for hospitals without a disaster plan face with. Often, disaster victims have flowed through just one hospital or they have been transported by ambulances to hospitals that were inadequately equipped or prepared.^[1] This chaotic situation, in effect, creates a secondary disaster problem. To prevent this problem, disaster triage must be performed both, at the site of the disaster and before arriving to the ED.^[2] Recently, Simple Triage and Rapid Treatment (START) system has been the preferred method and approach to a disaster situation in the United States as well as in other countries.^[2-5]

Often a hospital's level of disaster preparedness is not evaluated until a real disaster has occurred.^[6] Disaster drills must be performed by hospitals prior to a real disaster in order to gain experience, understand and assess the deficiencies, needs, and also strengths of their disaster plan.^[7-9] In the literatures, most of the previous studies involved prehospital di-

saster drills. In these reports, prehospital triage had an accuracy rate of 45% to 78%.^[2,10-12]

In contrast, our study examined the value of a hospital ED triage drill, its triage accuracy and time to initial evaluation. In addition, the hospital's pre-existing disaster plan, The Hacettepe University Disaster Plan was tested without a break the routine patient care in the ED during the drill.

Methods

The disaster drill study was conducted at Hacettepe University Hospital, one of the biggest hospitals in Ankara. The ED disaster triage drill was performed on June 15th, 2004. The ED triage drill was performed following a mock explosion scenario which was staged in front of the hospital. A total of 35 volunteers took part in this drill (emergency physicians, nurses, paramedics as well as 19 other hospital personnel as patients and patients' families). Before the drill, the front part of the ED was set up as the triage area and the ED was separated into 4 areas (1. red, 2. yellow, 3. green, 4. black). One EP was charged in triage area, one EP was charged in red area, one EP was charged in yellow area, one EP was charged in green area and one emergency nurse was charged in black area. Each of the 19 patients had different injuries which were not known by triage personnel prior to the drill (Table 1).

Triage drills were conducted according to Hacettepe University Hospital's Disaster Plan Book which was arranged and organized according to the Hospital Emergency Incident Command System (HEICS). Hacettepe University Hospital Triage Tags were prepared in a double-sided format, both in Turkish and English. The START triage system was used in this drill.

Table 1. Patients' injuries according to triage categories and their accuracies.

No	TCP	Injuries of patients	TAED	PTI
1	Red	Upper airway obstruction	Ambulance	Yes
1	Red	Facial burn, involving oro-pharynx	Ambulance	Yes
1	Yellow	Elbow dislocation	Taxi	Yes
2	Yellow	Humerus and elbow fractures	Taxi, car	Yes
2	Yellow	Second degree extremities burns	Car, taxi	Yes
1	Yellow	Penetrating injury to right eye	Car	Yes
3	Green	Soft tissue abrasions	Walking	Yes
2	Green	Sprained ankle, abrasion ankle	Taxi, car	Yes
1	Green	Epistaxis	Walking	Yes
3	Green	First degree extremities burns	Walking	Yes
1	Green	Finger fracture	Walking	Yes
1	Black	Multiple injuries-died	Ambulance	Yes

TCP: Triage colour of patients; TAED: Type of the arrival to the emergency department; PTI: Properly triaged and identified.

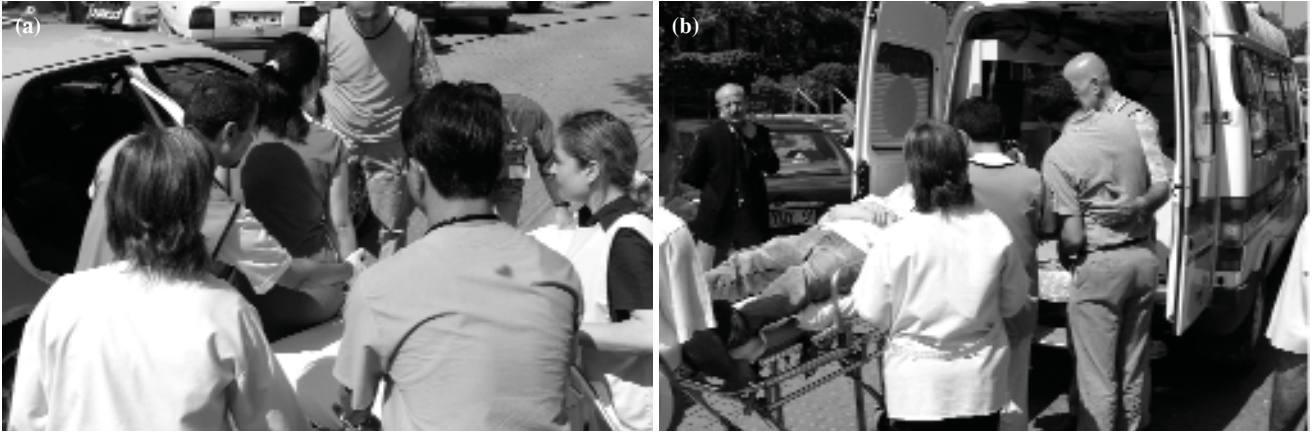


Fig. 1. (a) Victims arriving by taxi. (b) Victims arriving by ambulance.

For the drill, all of the hospital employees wore vests which were color-coded according to their assigned area and role during the drill.

All official personnel assigned in Hacettepe University Hospital Disaster Plan were theoretically and practically trained two weeks ago with regard to their roles and tasks during the disaster drill two weeks ago before the drill. After the drill, the accuracy of the triage and the total triage time were checked and compared to other studies.

Results

To further simulate a real disaster scenario, the 19 patients arrived at the ED by different ways. The first patients who arrived to hospital were pedestrian patients. They arrived after 2 minutes from mock explosion. All of these patients were green patients. Other patients arrived by different vehicles

(two taxis, one private vehicle and one ambulance) (Fig. 1a, b). All patients were quickly evaluated one by one in the triage by an EP and taken to suitable areas for initial stabilization. All patients were examined and their treatments were planned in new places by other employees (Fig. 2a, b). The triage drill was successfully completed in a total of 8 minutes. All of victims in the scenario were identified and triaged correctly (Table 1), thus finishing with an accuracy rate of 100%. All of employees in areas identified patients correctly. In addition, routine patient care in the ED did not cease during the drill. The hospital disaster plan was found to be adequate in the post-drill evaluation.

Discussion

Most of the disaster drill studies were conducted as prehospital scenarios^[2,10-12]

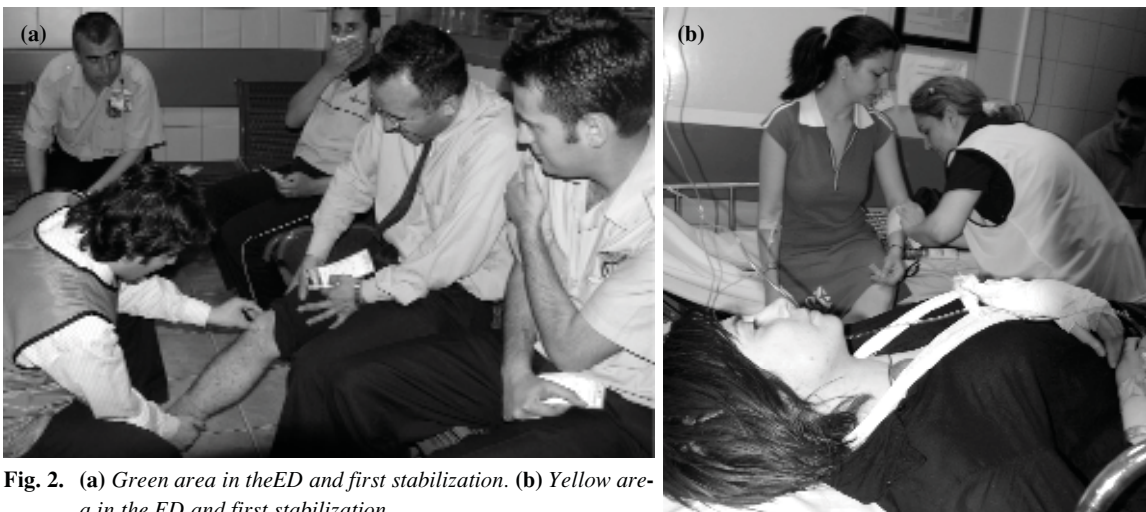


Fig. 2. (a) Green area in the ED and first stabilization. (b) Yellow area in the ED and first stabilization.

In a study by Shenker et al., the accuracy and speed of a disaster triage drill was evaluated in a prehospital setting which involved 130 patients. Their study reported a 78% accuracy rate for the correct triage of patients. Their highest accuracy rate was found in green patients (91%), while the lowest accuracy rate was found in yellow patients (25%). In their study, result times were calculated in two ways. First, they measured the time taking the patients to the triage area from the beginning of the drill. Second, they measured the time taking patients from triage area to the transport. They reported an average of 57 and 62 minutes, respectively.^[2]

Another drill study by Rehmani et al. was conducted in a university hospital. This drill study used a plane crash scenario, with 200 passengers and 50 victims. All of the victims arrived at the ED by ambulance. Their drill was completed in 2 hours.^[7]

Lau et al. conducted a different mock disaster scenario drill using 19 victims that all of them arrived at the ED by ambulance. Their drill was completed in 45 minutes.^[12] Although the START system may not be entirely ideal for certain populations (pediatric patients and some medical illnesses), it is still the preferred method for disaster protocols.^[25] We used for the evaluation of the disaster triage in the ED.

Our triage drill was completed in a shorter time (8 minutes) than other studies (45 minutes to 2 hours) and with a higher accuracy rate (100%) than others' (55% to 78%). We also were not found different among employees in the areas. Although our study results differs significantly from others, these differences can be attributed to the controlled factors specific to our disaster triage drill study. Our chosen site of disaster incident, an explosion just outside the hospital, placing the disaster zone closer to the ED when compared to the disaster zones in the other studies may be factors effected the results. In addition, the sample size in this disaster drill study was smaller than some of the other studies.

Finally, our study only evaluated ED triage time and accuracy while other studies evaluated various parameters.

Conclusion

ED Triage drill studies play a critical role in determining a hospital's ability whether adequately preparedness for disasters. Triage application times is important as well as its accuracy. Both of these properties may be improved with disaster drills.

Limitation

Our disaster drill was done after triage instructions. Our success may be effected from this. Therefore, this result should be compared with a next drill which can be performed without a training.

Acknowledgement

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