

# Emergency Service Experience following the Terrorist Attack in Mogadishu, 14 October 2017

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## Research

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# Abstract

**Background:** To evaluate the trauma patients presenting at the Emergency Department (ED) of Mogadishu Somalia Turkish Training and Research Hospital following the explosion caused by a suicide bomber with a truck loaded with explosives in the Somalian capital, Mogadishu.

**Methods:** The data of patients presenting at the hospital following the severe explosion on 14 October 2017 were accessed from the hospital information management system, patient examination forms and patient records and were retrospectively examined.

**Results:** The patients comprised 188 (74.6%) males and mean age of  $30.94 \pm 12.23$  years (range, 1-80 years). 86 (34.1%) patients were marked with red code, 138 (54.8%) patients had superficial injuries. 173 (68.7%) patients were managed in the ED and 7 (2.8%) patients died on first admission in the ED. Multiple trauma injuries were detected in 43 (17.1%) patients, and 31 (12.3%) patients were admitted to Orthopedics department

**Conclusion:** Disaster management in a terrorist event requires rapid transport, appropriate triage, effective surgical approaches and specific postoperative care. Such a form of disaster management can be effective in reducing mortality of the injured who can be saved.

## Introduction

A disaster is defined as an event that occurs suddenly disrupting normal conditions and causing difficulties at a level exceeding the capacity of the affected community to return to their previous state. In addition to natural disasters such as floods, earthquakes and landslides, terrorist attacks are also included in the concept of disasters (1).

Terrorism is a form of illegal behaviour applied in the form of random and ruthless violence, generally against innocent individuals, with the aim of intimidation against the policies and ideologies of a government or community (2). The increasing frequency of terror events has resulted in an increased need for emergency healthcare services and has shown that hospital healthcare personnel and resources must be used in a productive and sophisticated way (2). The morbidity and mortality of thousands of innocent victims because of the currently increasing numbers of terror attacks has increased the importance of disaster medicine (3). When the number of patients presenting at the same time exceeds the medical service capacity of the hospital, it is classified as a hospital disaster status (4, 5).

Early and appropriate initiation of disaster management helps to reduce morbidity and mortality. The primary problems of disaster management are those of triage and registration when the acute presentations at hospital increase in disaster situations. In addition, the lack of physical space for interventions to be made to patients is one of the main problems in the Emergency Department in the first 24-48 hours (6, 7).

The aim of this paper was to present our experiences in the hospital Emergency Department (ED) following the truck bombing in the Somalian capital of Mogadishu on 14 October 2017, which was the third largest suicide bombing event in world history (8), and to thereby contribute to the relevant data in literature.

## **Material And Methods**

The study included patients who presented and were registered at the Emergency Department of the Mogadishu Somalia Turkish Training and Research Hospital following the explosion caused by a suicide bomber with a truck loaded with explosives in the Somalian capital, Mogadishu on 14 October 2017. A retrospective examination was made of the records of the patients who were affected by the explosion and presented at our hospital. The data were retrieved from the hospital information management system, patient examination forms and patient files. The ethical board approval for the study was obtained.

### **Study Design**

On the day of the attack, more than 300 patients affected by the explosion presented at the hospital. All the patients who could be registered were those with life-threatening injuries who required immediate care, classified as code red triage, and those who required the care of a physician to prevent permanent damage but could wait, who were classified as code yellow. All patients were examined by the care of a physician but the patients could wait a longer time were triage classified as code green. This group, estimated to be approximately 50 patients, were not registered and were discharged after the application of dressings.

The patients included in the study were classified according to age, gender, triage code, location of major injury, department to which admitted, and discharge and/or exitus status. Patients not considered to have life-threatening priority were classified as superficial injuries (foreign body only, minimal burns, abrasion, minimal burn, laceration and superfisial foreign body). Patients with life-threatening injuries, who required follow-up or surgery were classified according to the anatomic region of the lesion. Patients evaluated with life-threatening multi-trauma were classified on the basis of the Abbreviated Injury Scale. In this scale, the body is divided into 4 main areas as the head-neck, extremities, thorax and abdomen, and trauma in at least 2 regions is accepted as multi-trauma (9).

### **Management of Patients on Admission**

On the day of the explosion, 1 Emergency Medicine specialist and 2 residents were working in the Emergency Department (ED) of our hospital, which is 1,4 km from the location of the attack. There were 29 other doctors on duty in the hospital at that time, comprising 3 anaesthesia and reanimation specialists, 2 general surgery specialists, 2 brain surgery specialists, 1 orthopaedics and traumatology specialist, 1 thoracic surgery specialist, 1 paediatric surgery specialist, 1 ophthalmology diseases specialist, 2 ear, nose and throat diseases specialists, 1 urology specialist and 14 internal- basic branch

specialist doctors (biochemistry, internal, paediatric, neurology, cardiology and radiology). The total bed capacity of the hospital is 219, including 2 separate 20-bed intensive care units.

The first casualties of the explosion reached the hospital ED approximately 20 mins after the explosion and continued to arrive for a period of 2 hours. The hospital administration reacted to the event very rapidly from the first moment and organised additional beds in the wards in the hospital which was on average 70% full at that time. Elective surgical cases were cancelled and patients in the wards who could be discharged were discharged immediately. In the ED, the wounded were taken to the 6-bed capacity yellow area, the 6-bed capacity green area, the resuscitation room, 2 trauma rooms and as there was insufficient space, the waiting room was also used.

First interventions to the patients were made by the rapidly formed trauma team, patients were transferred to the wards and it was attempted to decrease the intensity in ED. Within approximately 4 hours, the intensity in ED had reduced and in the following hours, patient admissions continued until late in the night with patients referred from other centres. Two different doctor teams were established for patients presenting at the hospital. The first of these (surgical branches and emergency specialists) admitted the patients and after the first intervention transferred them urgently to the relevant departments. The evaluated patients were admitted to the relevant units according to the part of the body most affected. Patients with an emergency clinical status were admitted for surgery, and an order of priority was established for those who were relatively elective. Patients with less severe injuries who could be followed up as out-patients were discharged after observation and re-called for further examination.

## **Statistical Analysis**

Statistical analyses of these parameters were made using SPSS vn 22.0 software. Numbers and percentage values were given for categorical variables as descriptive statistics.

## **Results**

The patients comprised 188 (74.6%) males and 64 (25.4%) females with an overall mean age of  $30.94 \pm 12.23$  years (range, 1-80 years), as  $31.04 \pm 9.71$  years (range, 7-47 years) for females and  $30.90 \pm 13.01$  years (range, 1-80 years) for males. 86 (34.1%) patients were marked with red code, 138 (54.8%) patients had superficial injuries. 173 (68.7%) patients were managed in the ED and 7 (2.8%) patients died on first admission in the ED. Multiple trauma injuries were detected in 43 (17.1%) patients, and 31 (12.3%) patients were admitted to Orthopedics department (Table 1). Other than study population, approximately over 50 patients visited the ED because of explosion, but these patients were marked with green code and all of patients with green code were unrecorded and discharged from the ED. After a few days, it was learned that one patient with green code died.

Emergency amputation was performed on 4 patients after the first evaluation in ED. Despite control of bleeding, 3 of these patients were exitus in the ED, and the other was lost during the first 24 hours of follow-up under ICU conditions. Of 4 patients accepted as exitus in the early period of presentation at ED,

this was due to severe brain damage associated with an open skull fracture in 1, major trauma in the abdominal region in 1, and hypovolemia and the subsequent development of shock associated with multiple trauma in 2.

A total of 35 patients, 10 from our hospital and 25 from other hospitals, who had severe status and the conditions in Somalia were not suitable for intervention in these cases, were transferred to Turkey by air ambulance. Of these transferred patients, 1 was exitus and the others returned to Somalia after treatment.

## Discussion

Situations where a number of patients exceeding the medical service capacity present simultaneously at a hospital is known as a hospital disaster. Various studies have reported several problems that are experienced by EDs in disaster situations (6, 7, 10). The main problems experienced in EDs in the first hours after a disaster are problems of triage and patient registration, caused by the increase in patient presentations and insufficient space for interventions to be made to patients (6). In these types of situations, triage made at the site of the event is of great importance in respect of not increasing the loss of work force in the ED and not increasing mortality rates. With classification of patients according to their general status, mechanism of injury and localisation of injury, they should be sent to hospitals according to the service that can be given (11, 12). As a single hospital capacity may not be sufficient for a disaster situation, the relevant authorities in co-ordination should distribute the cases to various hospitals (13). Thus, spreading the workload and the chaotic environment will help in being able to use the capacity in a more effective and productive manner. In this event in Mogadishu, as there was no institution or authority in the region that could provide co-ordination, such as an emergency call centre, the healthcare that could be given to the injured, the majority of whom were brought to the hospital by private cars, was disrupted. Effective triage made in the intervention area by mini trauma teams formed of doctors, nurses and auxiliary healthcare staff in ED according to the number of staff, should focus on patients at high risk of mortality.

The reason that approximately 75% of the patients injured in the explosion were male is that the sociocultural structure of the region requires that males take a greater role in social life. One of the most significant public health problems in the modern world is injuries that particularly affect the young age group and this is one of the significant causes of death (14). The mean age of the cases in this study was 30.9 years, which was similar to previous data in literature. The mean age of male and female patients was similar.

In this disaster, of the patients presenting at ED, 7 were lost in the early period and another 4 in the first hours during follow-up. Inner hospital mortality rate was 4.4% of all the patients who presented to the ED. Of the 79 patients who were hospitalised, mortality was seen in 4 (5%). In a study by Biancolini et al, mortality of 8.3% was reported in patients who were hospitalised following an explosion (15). Gutierrez et al reported a mortality rate of 1.6% of those who presented at hospital following a bombing (16). The

data of the current study were observed to be similar to some other studies in literature related to explosions.

Deaths in explosions, which are mass deaths, show tri-modal distribution. Approximately half of the deaths occur in the first minutes as they are generally because of severe head and vascular injuries. Then in the first hours, losses occur in the ED and operating theatre for reasons which can be treated such as intra-abdominal bleeding, intracranial bleeding and pneumothorax etc. Approximately 20% of deaths occur within days in ICU with late complications originating from severe sepsis and multi-organ failure. This tri-modal distribution has shown that emergency medicine specialists, surgeons and intensive care specialists are very important determinants in this process, especially in pre-hospital care (17, 18). Several studies have reported that disaster casualties have more wounds in the head and neck regions (19, 20). With a similar rate to previous findings in literature, the patients in the current study were seen to have been affected more in the head and upper extremities. It is thought that this could be due to the effect of the bomb in the open air and that the injuries were from fragments broken from buildings or vehicles.

Of the patients who presented at hospital and 31.3% were hospitalised. In other studies, this rate has varied from 9% to 28% (16, 21-23). This high rate could be attributed to the transfer to our hospital of critical state patients from other hospitals in the region. When the patients who presented at the hospital were evaluated according to the departments where they were admitted, although most admissions were to orthopaedics, there were observed to be injuries in most patients that required multiple surgeries. Following these types of mass terror attacks with extensive effects, it is expected that there will be injuries involving more than one surgical department. In multi-traumatic situations such as this when ICU bed capacity is insufficient, it can be considered better to admit the patient to the department related to the systems most affected by the major and vital findings and for continuous evaluation to be made by the other related surgical departments.

## **Limitations**

A limitation of this study is that as a result of the number of multi-trauma patients exceeding the service capacity presenting at the same time, the patient files and records in the hospital information management system could not be recorded in detail. There was seen to be a need for more than the data obtained in the retrospective scan, such as in the Trauma Injury Severity Score (TRISS) and the A Severity Characterisation of Trauma (ASCOT) scoring system recommended by the trauma committee established by the American College of Surgeons (24, 25). If more detailed records could have been made, more detailed research could have been conducted by accessing more important data in the medical disaster area.

## **Conclusion**

Disaster management in a terrorist event requires rapid transport, appropriate triage, effective surgical approaches and specific postoperative care. Such a form of disaster management can be effective in reducing mortality of the injured who can be saved. Recording the patients data is very difficult in such as

this situation. Although, performing triage is very effective in a disaster but re-evaluation the patients must not be forgotten.

## Declarations

**Ethical approval and Consent to participate:** Ethics committee approval was obtained from Ethic board of Mogadishu Somalia-Turkey Recep Tayyip Erdoğan Education and Research Hospital (Date: 25/12/2017; Decision no: 27/MSTH/4123). Consent to participate is not applicable for this retrospective study.

**Consent for publication:** Consent for publication was obtained from administration of Mogadishu Somalia-Turkey Recep Tayyip Erdoğan Education and Research Hospital.

**Availability of data and materials:** Submitted work is original and has not been published elsewhere in any language. Raw data are available for the editor on request.

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## Tables

### Table 1- Descriptive data of the patients

<b>Parameter</b>	<b>Value</b>
<b>Gender</b>	Male n=188 (74.6%) Female n=64 (25.4%)
<b>Age [Mean±SD(min-max)]</b>	30.94±12.23 years (1-80)
<b>Triage code of the Patients</b>	
Code Green*	n>50 (unknown%)
Code Yellow	n=166 (65.9%)
Code Red	n= 86 (34.1%)
<b>Body Region of Injury (n,%)</b>	
Superficial injuries	n=138 (54.8%)
Upper extremite injuries	n=19 (7.5%)
Lower extremite injuries	n=9 (3.6%)
Head injuries	n=31 (12.3%)
Thorax injuries	n=6 (2.4%)
Abdomen injuries	n=6 (2.4%)
Multiple trauma injuries	n=43 (17.1%)
<b>Outcomes of the Patients</b>	
<b>Management in the ED (n,%)</b>	<b>n=173 (68.7%)</b>
<i>Discharge from ED</i>	n=166 (65.9%)
<i>Exitus in the ED</i>	n=7 (2.8%)
<b>Admission to the hospital (n,%)</b>	<b>n=79 (31.3%)</b>
<i>Orthopedics</i>	n=31 (12.3%)
<i>General Surgery</i>	n=11 (4.4%)
<i>Neurosurgery</i>	n=12 (4.8%)
<i>Thoracic and CVS</i>	n=4 81.6%
<i>Plastic Surgery</i>	n=1 (0.4%)
<i>ICU (Intensive Care Unit)</i>	n=13 (5.2%)
<i>Other Surgery Services</i>	n=7 (2.8%)

\* The patients with green code were not admitted to the ER because of low capacity of hospital. Because of that real number of green patients is unknown.