Injury, Int. J. Care Injured (2008) **39**, 77—82

ELSEVIER

INJURY
INTERNATIONAL JOURNAL OF THE CARE OF THE INJURED

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The burden of terrorism: High rate of recurrent hospital referrals

Malka Avitzour [a], Yoav Mintz [b], Meir Liebergall [c], Rami Mosheiff [d,*]

[a] *Epidemiology and Trauma, Braun School of Public Health and Community Medicine, Hebrew University, Jerusalem, Israel*
[b] *Department of Surgery, Hadassah-Hebrew University Medical Center, Jerusalem, Israel*
[c] *Department of Orthopaedic Surgery, Hadassah-Hebrew University Medical Center, Jerusalem, Israel*
[d] *Orthopaedic Trauma Unit, Department of Orthopaedic Surgery, Hadassah-Hebrew University Medical Center, Jerusalem, Israel*

Accepted 28 August 2007

KEYWORDS
Terrorism;
Burden;
Recurrent hospital referrals;
Terror victims;
Trauma registry

Summary

Background: Recurrent emergency room referrals and re-hospitalisation of terror victims (external cause of injury E990—E998 and selected cases from E970—E978) [International Classification of Diseases, 9th revision. Clinical modification, 5th ed. (ICD-9-CM). Los Angeles, CA: Practice Management Information Corporation; 1998] have not as yet been examined in the literature. Our objective was to evaluate the extent of hospital services' usage following a terror event and to characterise the casualties who return for hospitalisation and rehabilitation following their discharge.
Methods: A retrospective longitudinal study including all terror victims who were hospitalised at our level I trauma centre between October 2000 and March 2004. Data on the first hospitalisation of these victims ($n = 497$ cases) were retrieved from the hospital's trauma registry. Data on recurrent emergency room referrals and re-hospitalisation of the 464 cases who survived were taken from the hospital's administrative computerised database.
Results: Four hundred and ninety-seven terror victims were hospitalised, of which 464 survived their first hospitalisation. Two hundred and nineteen (47%) were subsequently re-referred to the hospital. The total number of recurrent hospital referral days amounted to 77% of the total first hospitalisation days for all casualties.

A strong association was found with regard to severity of injury, length of stay in the intensive care unit (ICU) and total length of stay. Logistic regression analysis found total length of stay of initial hospitalisation as the only significant variable.

* Corresponding author.
E-mail address: ramim@cc.huji.ac.il (R. Mosheiff).

0020-1383/$ — see front matter
doi:10.1016/j.injury.2007.08.035

Conclusions: The recurrent hospitalisation of terror victims places a heavy burden on the health system. Further studies should be conducted to determine the reasons for these recurrent referrals and to explore whether the number of recurrent referrals can be reduced or at least planned for.

Introduction

Recent surges of terrorism around the world have necessitated the re-organisation of medical systems. In areas where terror has persisted for a long period of time, health services have had to confront additional unplanned burdens.

Recurrent emergency room referrals and the re-hospitalisation of terror victims result from both the nature of their injuries as well as the design and structure of the medical system. Recurrent referrals are only one aspect of the heavy mental and financial burden imposed on the patient, the patient's family and the medical system.

Marwitz et al. report that 23% of head trauma patients are re-hospitalised during the first year following injury. Orthopaedic and/ or reconstructive surgery and infections were the primary reasons for re-hospitalisation.[4]

Middleton et al. conducted a 10-year follow-up on spine trauma patients and showed that 58.6% were re-hospitalised. With each additional hospitalisation, the length of hospitalisation decreased. Re-hospitalisation was most frequently related to complications of the genitourinary system with urinary tract infections being the single most common cause.[5]

A Canadian study of hip fracture among 527 eligible patients aged 50+ found that 13.8% were re-hospitalised during the following year, for a condition related to the hip fracture. The cost of re-hospitalisations represented 4—6% of the total cost during the first year of follow-up, including rehabilitation and community and home care.[10]

Age, severity of injury, duration of initial hospitalisation and the general condition of the patient on discharge have been found to affect the number and nature of re-hospitalisations. Of 8000 patients who underwent rehabilitation following hip fracture in the USA, 16.7% returned to the hospital;[6] gender, ethnic origin, duration of previous hospitalisation stay and a score of daily living skills were found to be related to recurrent referral.

The Functional Independence Measure as well as the financing agent were also found to be predictors of re-hospitalisation.[2]

Terror victims are the most severely injured patients among all casualties hospitalised including: motor vehicle accidents, falls, burns, work accidents and others[7,9] with 31% having an Injury Severity Score (ISS)[1] of 16 or more in contrast to 10.3% among other casualties. Approximately one-quarter of terror victims require admission to the intensive care unit (ICU) versus 7% among other injured patients, e.g. road accidents, work accidents, falls.

They also have a unique pattern of injury. We were introduced to a previously unknown form of injury, created by using sharp metals such as nails and bolts within the explosives. These projectiles are propelled in all directions causing penetrating injuries, which are hard to detect. Special imaging, for example, body fluoroscopy, is required to find metal in explosion victims.[8]

The aim of this study was to assess the burden on the hospital following a terror event in terms of admission to the ER, total length of hospital stay and stay in the ICU, and to characterise the casualties who are re-hospitalised and undergo rehabilitation following their first discharge.

Methods

We conducted a retrospective longitudinal study which included all terror victims (external cause of injury E990—E998 and selected cases from E970—E978)[3] who arrived at our level I trauma centre between October 2000 and March 2004, and were hospitalised due to their injury and recoded in the Trauma Registry. In Israel, following terror events, all victims arrive as quickly as possible at an emergency room directly from the scene, generally by ambulance, without having been examined by a primary care physician.

We collected data concerning the first referral of all of these casualties as well as their recurrent referrals to our emergency department, or for hospitalisation or rehabilitation between October 2000 and March 2005. The follow-up period spanned from 1 to 4.5 years, depending on the date of injury. For those who arrived at the hospital during October 2000, we have a follow-up period of 4.5 years, while for those who arrived at the hospital during April 2004, the follow-up period was only 1 year. The data included demographic details: gender, age, ISS and mechanism of injury. Unfortunately, data with regard to whether the victim visited a medical professional prior to his readmission is not a variable that exists in our hospital medical files.