Hospital management of abdominal trauma in Tehran, Iran: a review of 228 patients

Javad Salimi*, Mohammad Ghodsi, Maryam Nassaji Zavvarh and Ali Khaji

Objective: Today, trauma is a major public health problem in some countries. Abdominal trauma is the source of significant mortality and morbidity with both blunt and penetrating injuries. We performed an epidemiological study of abdominal trauma (AT) in Tehran, Iran. We used all our sources to describe the epidemiology and outcome of patients with AT.

Methods: This study was done in Tehran. The study population included trauma patients admitted to the emergency department of six general hospitals in Tehran during one year. The data were collected through a questionnaire that was completed by a trained physician at the trauma center. The statistical analysis was performed using the SPSS software (version 11.5 for Windows). The statistical analysis was conducted using the chi-square and \( P<0.05 \) was accepted as being statistically significant.

Results: Two hundred and twenty-eight (2.8%) out of 8 000 patients were referred to the above mentioned centers with abdominal trauma. One hundred and twenty-five (54.9%) of the patients were in their 2nd and 3rd decades of life and 189 (83%) of our patients were male. Road traffic accidents (RTA) were the leading cause of AT with 119 (52.2%) patients. Spleen was the commonly injured organ with 51 cases. Following the analysis of injury severity, 159 (69.7%) patients had mild injuries (ISS<16) and 69 (30.3%) patients had severe injuries (ISS=16). The overall mortality rate was 46 (20.2%).

Conclusions: Blunt abdominal trauma is more common than penetrating abdominal trauma. Road traffic accidents and stab wound are the most common causes of blunt and penetrating trauma, respectively. Spleen is the most commonly injured organ in these patients. The mortality rate is higher in blunt trauma than penetrating one.

Key words: Wounds and injuries; Mortality; Abdominal injuries

DOI: 10.3760/cma.j.issn.1008-1275.2009.05.001
Sina Trauma & Surgery Research Center, Tehran University of Medical Sciences, Tehran 11364, Iran (Salimi J, Ghodsi M, Zavvarh MN, and Khaji A).

*Corresponding author: Tel: 98-21-66717421, Fax: 98-21-66717449, E-mail: mjsalimi@sina.tums.ac.ir

Trauma is the main cause of mortality within the first four decades of life; it is also the fifth major cause of mortality in all ages. The major proportion of trauma mortalities occurs in developing countries and road traffic injuries listed the foremost part of it.\(^1\) In other words, motor car accidents are the 11th cause of mortality in the world and 90% of the resulting mortalities occur in countries with middle and low incomes.\(^2\)

Injuries are a neglected epidemic in developing countries, causing more than five millions of deaths each year, roughly equal to the number of deaths from HIV/AIDS, malaria and tuberculosis combined.\(^3\) The crude mortality rate from accidental injury in rural areas of 13 provinces in the Islamic Republic of Iran from 1993 to 1994 was 4.33 per 1 000 and the number of deaths resulting from unintentional injuries was 5 213 (10.7% of all deaths).\(^4\)

The abdomen is frequently injured after both blunt and penetrating trauma. Approximately 25% of all trauma victims will require an abdominal exploration.\(^5\) Massive intra-abdominal hemorrhage following blunt abdominal injury has been reported to be one of the most important causes of early mortality following severe trauma with overall mortality rates between 4% and 31%.\(^6\) We used all our sources to describe the epidemiology and outcome of patients with abdominal trauma.
METHODS

This study was done in Tehran, which has the highest population among all cities of Iran (6,758,845 population in 1995). Tehran has a high volume of traffic and therefore traffic accidents occur more than expected. There is not any specific center for trauma in Tehran and trauma patients are referred to teaching hospitals of medical universities. The study population included AT patients admitted to the emergency department of six general hospitals in Tehran during one year. The data were collected through a questionnaire, designed in Sina Trauma and Surgery Research Center (STSRC). The questionnaires were completed by a trained physician at the trauma centers of different geographical regions of Tehran. Among 8,000 patients examined at the hospitals, we selected the AT cases (228 patients) admitted to the hospitals. The data obtained included patient demographics, mechanisms of trauma, injury severity score (ISS), organ injuries, ICU admission and treatment outcomes. The injured organs were classified based on ICD10 (international classification of disease and related health problems). The statistical analysis was performed using the SPSS software (version 11.5 for Windows). The statistical analysis using the chi-square and $P<0.05$ was accepted as being statistically significant.

RESULTS

Demography

During the one year of the study, 2.9% (228/8000) of the patients sustained AT. There were 189 (83%) males and 39 (17.1%) females. Sex difference was statistically significant in blunt and penetrating traumas (Table 1). The mean age of the patients was 29 years ±16.5 years (ranging from 2 to 84 years).

One hundred and twenty-five (54.9%) patients were in their 2nd and 3rd decades of life. The most common place of injury occurrence was the road with 146 (64%) cases followed by home with 33 (14.5%) cases.

Mechanism

The most frequent mechanism of trauma was road traffic accidents (RTA) in 119 (52.2%) cases, followed by stab wound and fall with 61 (26.8%) and 27 (11.8%) patients, respectively.

The most frequent mechanism of penetrating trauma was stab wound, and because of the low rate of exposure to firearm in this country, only a few cases of firearm injuries were found (Table 2).

Organ injuries

One hundred and sixteen (50.9%) patients sustained more than one injury. Abrasion involved in 95 cases was the most common injury in the abdominal trauma. Spleen was the commonly injured organ in 51 cases, followed by kidney, accounting for 37 cases. Liver was injured in 21 cases while small intestine was injured in 18 cases (Table 3).

Mortality

Forty-six (20.2%) patients succumbed to injury, among which, 10 (21.7%) were female and 36 (70.3%) were male. The death of 41 (89.13%) patients was due to blunt trauma and 5 (10.9%) due to penetrating trauma and the difference was statistically significant ($P<0.05$). Head and abdominal injuries were the main causes of death with 19 (41.3%) cases followed by pelvic injury, with 4 (8.6%) deaths, chest injury with 2 (4.3%) deaths and injury of blood vessels with 2 (4.3%) deaths. Eight (17.4%) patients died before reaching the hospital, 22 (47.8%) died in the emergency department, 3 (6.5%) died in surgery wards, 4 (8.7%) died in operating room, and 9 (19.6%) died in ICU.

| Table 1. Distribution of trauma relating to sex, ISS, multiple trauma and mortality |
|---------------------------------|---------|---------|----------------|--------|--------|
| Patterns of injury              | Sex     | ISS     | Multiple trauma | Mortality |
|                                 | Female  | Male    | <16  | =16  | Yes | No  | Yes | No  |
| Blunt trauma                    | 36      | 123     | 100  | 59   | 100 | 59  | 41  | 118 |
| Penetrating trauma              | 3       | 66      | 60   | 9    | 16  | 53  | 5   | 64  |
| $P$ values                      | 0.000   | 0.000   | 0.000| 0.001|      |      |     |     |

PDF 文件使用 "pdfFactory Pro" 试用版本创建 www.fineprint.cn
Severity of injury

On the analysis of injury severity, 159 (69.7%) patients had mild injuries (ISS<16) and 69 (30.3%) patients had severe injuries (ISS ≥ 16). Table 1 shows that patients with penetrating injury are the minority and tend to be less severely injured. There were 59 and 9 cases of severe injury in blunt and penetrating traumas and their difference was statistically significant (P<0.05).

DISCUSSION

Trauma to the abdomen in Iran mainly affects young men with 40.8% of the injuries due to RTA. Overall, males were affected 4.85 times more than females and the patients aged between 20 to 29 years accounted for 30.3% of the study population. This is the most productive age group and has grave impact on the national economy and families who depend on these young men and women for their survival. RTA mostly occurs in males and this might be due to the socio-cultural pattern of our country like many other countries that have a traditional pattern of family and the majority of women spend most of their time at home. Similar findings have been reported in earlier series.7-9 Overloading, poor vehicle maintenance and bad roads are the main factors resulting in traffic injuries in developing countries. Because the most frequent mechanism of injury is RTA, any efforts to prevent this sort of injury should be of the utmost value for the prevention of trauma in this society. Other important contributory forces to these injuries are stab wound, falls, blunt objects, and firearm. These together include 47.8% of the injuries. Blunt injuries are 2.3 times more frequent than the penetrating injuries, and these patients tend to be more severely injured.10

Our preliminary analysis shows that patients with blunt abdominal trauma should be the focus of attention due to the high involvement injuries (Table 1). Spleen is the most common injured organ, which is similar to many other studies.9,11,12 Splenic injuries occur in 51 cases of the abdominal organ injuries. This is distantly followed by kidney and liver injuries that respectively occur in 37 and 21 cases of the total. The overall mortality rate is 20.2% and that is higher than the previous studies in our country (2%) and other countries.10,11 Forty-one of 46 death cases occur in blunt trauma. These data are probably a reflection of non-existent pre-hospital care in Iran, inappropriate means of transporting injured persons and unsatisfactory hospital-based management.13 This may, as well, be the tip of the iceberg, as the absence of an effective emergency response system may mean that many patients with multiple traumas including blunt abdominal trauma following traffic injuries perish in accident scenes in developing countries. Prevention of traffic injury will clearly be the best approach towards reduction of blunt abdominal trauma. Two areas towards this achievement are worth mentioning, construction and maintenance of good roads and effective enforcement of motor traffic regulations. Motor traffic regulations are flouted with impunity in many developing countries and this needs serious attention for good engineering design of the roads.

In conclusion, blunt abdominal trauma is more common than penetrating abdominal trauma and road traffic accident and stab wound are the most common causes for blunt and penetrating traumas, respectively. Adult males are the most common victims because they have more outdoor activities. Spleen is the most commonly injured organ in patients. Mortality rate in blunt trauma is higher than that of penetrating trauma.
REFERENCES


(Received February 1, 2009)
Edited by SONG Shuang-ming