

The demographics and outcome of patients with penetrating abdominal trauma admitted to emergency medicine department: A descriptive cross-sectional study

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Abstract

Background: This study was performed to determine the demographic and outcome of penetrating abdominal trauma in patients attending to emergency medicine department.

Materials and Methods: This was a descriptive cross-sectional study in Imam Hossein Medical Center. Seventy five patients who came to our department with penetrating abdominal trauma during a 1 year period were enrolled into this study and their demographic data and outcome (during the hospitalization) were recorded. The study was at Imam Hossein Medical Center, Tehran, Iran, from 2009 to 2010.

Results: Our findings indicate these notable results: 84% of patients were less than 40 years old, most patients attended emergency department during the spring and summer, 72 patients (96%) arrived between 7 pm and 7 am, 74 patients (98.7%) had stab wound and one person (1.3%) was shot, eventually 46 patients (61%) had laparotomy performed and 2 patients (2.7%) died. 59 patients out of 75 study cases appealed to police department and legal medicine council.

Conclusions: The incidence of abdominal penetrating trauma due to stab wound is much higher than gunshot in our community, which indicates the importance of educating the emergency staff and preparing the emergency department work place to attend to these patients, especially during the night hours.

Key Words: Emergency room, penetrating abdominal trauma, outcome

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INTRODUCTION

During the last several decades due to a decline in

infectious diseases prevalence trauma has become a prominent cause of morbidity and mortality. Abdomen is a common site of trauma and based on current reports a great majority of traumatic accidents causing mortality involve the abdomen.^[1]

Abdominal trauma is divided into two categories of penetrating and blunt trauma. In general, the blunt trauma causes more mortality and regardless of recent advances in imaging techniques, like computerized tomography, management of trauma still poses as a challenge for emergency specialists.^[2]

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About 60% of abdominal blunt traumas are caused by motor vehicle accidents.^[3] Spleen, liver, kidneys, and intestines are the most common sites of injury in a blunt abdominal trauma with spleen being the most common site.^[4,5] In comparison, the most common site for penetrating abdominal injury is the intestine.^[4,5]

Physical exam is still the most reliable way of diagnosis in conscious patients, but imaging modalities like X-ray, sonography, CT-scan, and abdominal lavage might be performed in order to help in diagnosis process. Laparoscopy is another way of confirming the diagnosis, but its advantage over other diagnostic methods in critical patients is debated.^[6]

In a study by Casali *et al.*, the mortality rate for patients suffering from penetrating abdominal trauma was reported to be 3/85%, and 14/3% of patients needed surgery.^[7] Clarke *et al.* reported 56 patients needing surgery out of 340 patients with penetrating abdominal trauma, which is about 16/5% of patients.^[8] Other studies indicate a much higher rate of surgery in patients with penetrating abdominal trauma, for example, Mac Carthy *et al.* reported a 68% rate of surgery.^[9] These findings indicate a large variation in the rate of patients needing surgery, which in most part is due to differences in causation of penetrating abdominal injuries in different societies.

Considering the fact that few studies have been performed to investigate the nature of penetrating abdominal trauma in our population, this study was performed in Imam Hossein Medical Center, with an active emergency department covering the eastern Tehran province to investigate the demographics and outcome of penetrating abdominal injuries in a 1 year period.

MATERIALS AND METHODS

This observational descriptive cross-sectional study was conducted at Imam Hussein Medical Center, a teaching hospital, in the center of Tehran from March 2009 to March 2010. Imam Hossein Medical Center is a referral hospital with 505 beds. It is also a major trauma center treating on average 60,000 patients annually in its ED of which approximately one third are trauma patients. This ED has 60 beds of which 30 beds are in the trauma section.

A questionnaire was designed to record the information for patients with penetrating abdominal trauma which was filled by emergency medicine residents. Demographics like age, sex, cause of trauma, and

physical exam findings were recorded. The results of imaging modalities and the outcome of patients during hospital stay were also recorded. Other information related to the study like the time of admission was also obtained.

All data were analyzed using SPSS software (Version 17, SPSS Inc., Chicago, Illinois, USA) and chi-Square and Fisher's exact tests were used. We considered *P* value less than 0.05 to be significant

Inclusion criteria

All patients with penetrating abdominal trauma.

Exclusion criteria

All patients who leaved the Emergency Room(ER) before adequate management (12 patients) were excluded.

RESULTS

Out of 18,367 trauma patients coming to emergency department during the study period, 472 patients had penetrating trauma and 87 patients had penetrating abdominal trauma. Considering the fact that 12 patients left the hospital before adequate management for personal reasons 75 patients entered the study [Table 1]. Out of 75 patients, 63 patients (84%) were under 40 years old. Most patients came to hospital in spring (42.7%) and summer (33.3%). Seventy two patients (96%) came to hospital at night (from 7 pm to 7 am).

Seventy four patients (98.7%) had stab wound and one patient (1.3%) was shot. Sixty nine patients (92%) were involved in a fight and 6 patients (8%) had committed suicide. Seventy one patients (94.7%) had stable vital signs and 4 patients (5.3%) were unstable.

Sonography was performed for 35 patients, CT-scan for 11 patients, peritoneal lavage for 21 patients, and wound exploration for 12 patients. Five patients (14.3%) had free fluid in sonography and peritoneal lavage was positive in 13 (61.9%) of patients who underwent this procedure. Ten case of fascia penetration were found among patients who underwent wound exploration. In three patients, the CT-scan indicated liver or spleen hematoma, and out of 75 patients 2 patients (2.7%) died. The cause of death in these patients was injury of internal organs like liver and intestine and also penetration of main vessels.

Based on the physical exam and diagnostic tests, 46 patients (61%) needed surgery. Among patients who underwent surgery 14 patients (30.4) had liver rupture, 9 (19.6%) had intestinal rupture, 6 (13%)

Table 1: Patient's demographic variables

| Variable | Frequency |
|-------------------|-------------------------|
| Age | Mean 25.9 (16-70 years) |
| Gender | M/F: 68/7 |
| Educational level | 77.3% less than diploma |
| Injury cause | 98.7 stab Violence |

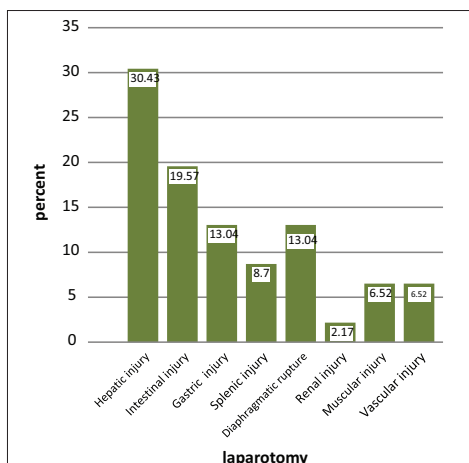


Figure 1: Pathologic findings after laparotomy in patients with abdominal penetrating trauma

had stomach rupture, 4 (8.7%) had spleen rupture, 1 (2.2%) had kidney rupture, 3 (6.7%) had main vessels injury, and finally, 3 (6.7%) had only muscular injury [Figure 1].

Twenty two (29%) of patients were released from emergency department after initial exams and management. Seven patients (9%) were hospitalized in surgery department, from 1 to 2 day before release, and 46 (61%) underwent surgery. Out of 76 patients, 59 patients out of 76 study cases appealed to police department and legal medicine council and 47 patients were given punitive damages.

DISCUSSION

There are serious legal restrictions of cold weapons in Iran, this is still a main cause of admission to emergency departments in our country. The study of prevalence and outcome of these patients as well as establishing protocols to ready the emergency departments for treating these patients seems to have a high priority.

The results of the present study indicates that the majority of patients suffering from stab wound are in productive age (under 40) and have been involved in a street fight. More than 95% of patients

have been admitted during night hours when the emergency specialists are on cell and not present at the hospital. This indicates the need for a plan of care which necessitates more attendance by specialists in emergency department of trauma centers during the night hours.

In a study by Casali *et al.*, in Italy the death rate was 3.85% in patients with penetrating abdominal trauma.^[10] Clarke *et al.* reported a zero death rate among 340 patients^[8] and Uludag *et al.* reported a 2.63% mortality. In our study, the death rate was 2.7% which is in line with other studies.

In studies published in other countries firearms cause much greater number of abdominal penetrating wounds compared to our study, which might be due to strong restriction of these weapons in Iran, but our patients suffer from a high number of stab wounds.

CONCLUSION

The incidence of abdominal penetrating trauma due to stab wound is much higher than gunshot wounds in our community, which indicates the importance of educating the emergency staff and preparing the emergency department work place to attend to these patients especially during the night hours.

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