Epidemiology of Urogenital Trauma in Iran
Results of the Iranian National Trauma Project

Javad Salimi, Mohammad Reza Nikoobakht, Ali Khaji

Introduction: We report the incidence, distribution, etiology, and outcome of the urogenital trauma in 8 major cities of Iran according to the database of national trauma project.

Materials and Methods: Between 2000 and 2004, we prospectively collected the data of all the traumatic patients hospitalized for more than 24 hours in 8 cities (Tehran, Mashad, Ahwaz, Shiraz, Tabriz, Qom, Kermanshah, and Babol). We analysed the data taken from 17 753 trauma admissions. Patients with sustained urogenital traumas were identified and studied.

Results: A total of 175 patients (0.98%) had injuries to the urogenital system. Male to female ratio was 4. The patients' mean age was 25 ± 16 years (range, 2 to 80 years). Of 175 patients, 159 (90.9%) had blunt trauma and 16 (9.1%) had penetrating trauma. Road traffic accident was the most common cause of trauma (65.1%). The most common injured organs were the kidney in 61.1% and the bladder in 13.7%. One hundred and forty-two patients (81.1%) had associated intra-abdominal injuries and 129 (73.7%) had other accompanying injuries. Sixty (34.2%) patients required surgical intervention. Nine patients (5.2%) died due to the severity of the injuries. All patients who died had severe injuries (Injury Severity Score >12).

Conclusion: In Iran, blunt traumas including road traffic accidents are the main cause of urogenital traumas. The majority of the patients with urogenital trauma have multiple injuries and require a multidisciplinary approach.

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INTRODUCTION

Disabilities caused by trauma has become one of the most serious public health problems in developed countries as well as countries with low total annual income.[1] Urogenital traumas are responsible for up to 10% of trauma admissions in the United States.[2] They are commonly seen in the emergency rooms, and the primary-care physician plays a pivotal role in the initial evaluation and treatment of them. Although urogenital traumas are rarely life threatening, they can cause significant long-term morbidities such as sexual dysfunction or urinary tract disorders.[3] Up to 10% of the patients with multiple trauma have involvement of the urogenital system; 10% to 15% of the traumatic patients with abdominal injuries have urogenital involvement.[4] During the evaluation of the patients with multiple trauma, the probability of urogenital traumas should be considered in order to detect them at early stages.[5] Kidney injuries constitute 45% of all urogenital traumas and the most common cause is blunt trauma. Bladder injuries are most commonly caused by the pelvic fractures. In 5% to 10% of the cases with pelvic fracture, urinary tract

Trauma and Surgery Research Center, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran

Corresponding Author:
Javad Salimi, MD
Sina Trauma and Surgery Research Center, Sina Hospital, Hassan Abad Sq, Tehran 11364, Iran
Tel: +98 21 6673 5018
Fax: +98 21 6673 5018
E-mail: mjsalimi@sina.tums.ac.ir

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injuries are detected.[6,7] Mortality from the upper urinary tract trauma is primarily attributable to other associated injuries and morbidity rate is reported to be 26%.[4]

An ideal management of patients with urogenital trauma requires comprehensive epidemiological information which may be different in each region or time. Updated data concerning these traumas in our country is a requisite. We decided to perform this study to determine the incidence, severity, and treatment outcome of urogenital trauma in Iran.

MATERIALS AND METHODS

During a 4-year period (2000 to 2004), a cross-sectional study was performed as a part of the National Trauma Project in 8 major cities (Tehran, for 13 months; Mashad and Ahwaz for 7 months; and Shiraz, Tabriz, Qom, Kermanshah, and Babul for 4 months). The study was set up in accordance with the American College of Surgeons National Trauma Registry System (TRACS) and the National Trauma Data Bank (NTDB) using a valid questionnaire.[8,9] A group of physicians were trained for the process of data collection during several sections. During the study period, the trained physicians visited traumatic patients at their first 24-hour admission to the emergency rooms and wards and completed the questionnaires.

A total of 17 753 patients were referred to the trauma centers of those cities and hospitalized for more than 24 hours. Data obtained included patients' demographics, prehospital care, diagnosis, Glasgow Coma Scale (GCS) and vital signs at the time of presentation to emergency departments, Injury Severity Score (ISS), therapeutic measures, duration of hospital stay and intensive care unit, the outcome, and the source of reimbursement. The type of the injury and mechanism of the accidents were coded according to the International Classification of Diseases, 10th revision (ICD-10).[10] The ISS was used to provide an overall score for patients with multiple injuries. Each injury is assigned an Abbreviated Injury Scale (AIS) score and is allocated to one of the 6 body regions (head, face, chest, abdomen, and extremities [including Pelvis], and external).[11] Only the highest AIS score is used in each body region. The first 3 most severely damaged body regions have their score squared and added together to produce the ISS score.

Traumatic patients with confirmed injuries to the urogenital system were enrolled in the study. The collected data were analyzed using SPSS software (Statistical Package for the Social Sciences, version 10.0, SPSS Inc, Chicago, Ill, USA).

RESULTS

Of 17 753 traumatic patients, 175 (0.98%) had injuries to the urogenital system. One hundred and forty (80%) patients were men and 35 (20%) were women (male-female ratio, 4). The patients' mean age was 25.0 ± 16.0 years (range, 2 to 80 years). The highest incidence (29.7%) was seen in the age group of 21 to 30 years followed by 26.9% and 18.3% in the groups of 11 to 20 years and 1 to 10 years, respectively.

Table 1. Characteristics of Trauma in Patients with Urogenital Trauma

Trauma	Patients (%)
Mechanism	
Accident	114 (65.1)
Pedestrian	47 (26.8)
Passenger or driver	33 (18.8)
Motorcycle rider	23 (13.1)
Bicycle rider	7 (4.0)
Others	4 (2.2)
Fall	31 (17.7)
Blunt object	12 (6.9)
Cutting	7 (4.0)
Gunshot	5 (2.9)
Shotgun	1 (0.6)
Others	5 (2.9)
Place	
Home	23 (13.1)
Work place	23 (13.1)
Road	117 (66.9)
Recreation and sport centers	6 (3.4)
Others	6 (3.4)
Injured organs	
Kidneys	107 (61.1)
Bladder	24 (13.7)
Urethra	15 (8.6)
Ovary	5 (2.8)
External genitalia	4 (2.3)
Ureter	3 (1.7)
Uterus	1 (0.6)
Renal vessels and other pelvic organs	16 (9.2)
Associated injuries	
Head and neck	64 (36.6)
Thorax	40 (22.9)
Abdomen and pelvis	142 (81.8)
Upper extremities	36 (20.6)
Lower extremities	56 (32.0)

Of 175 patients, 159 (90.9%) had blunt trauma and 16 (9.1%) had penetrating trauma. Trauma mechanisms are listed in Table 1. Road traffic accident was the most common type (114 patients, 65.1%). In addition, 117 patients (66.9%) and 23 patients (13.1%) were injured in street clashes and at work, respectively (Table 1).

The most common injured organ was the kidney in 61.1% of the patients, followed by the bladder in 13.7% (Table 1). One hundred and forty-two patients (81.1%) had associated intra-abdominal injuries and 129 (73.7%) had other accompanying injuries (Table 1). Blunt multiple trauma was the most common type in the patients with accompanying injuries (95 patients; 73.6%).

Sixty (34.2%) patients required surgical management on the urogenital system (Table 2).

Forty-five out of 46 patients (97.8%) with isolated urinary tract trauma survived. Nine patients (5.2%) died due to the severity of the injuries, 8 of whom had accompanying injuries (7 patients with kidney injury and 1 with bladder injury).

Table 3 shows the scores according to the ISS; 31% and 43% of the patients had mild (ISS < 7) and severe (ISS > 12) injuries, respectively. All died patients had severe injuries.

Table 2. Managements of Urogenital Trauma

Treatment	Patients (%)
Operative management	51 (29.1)
Nephrectomy	17 (9.7)
Bladder repair	16 (9.2)
Urethra repair	10 (5.7)
Kidney repair	7 (4)
Ureter repair	1 (0.5)
Conservative management	115 (65.7)
Mortality	9 (5.2)
Total	175 (100.0)

DISCUSSION

Trauma registries have been extensively used for the evaluation of the management and outcome of trauma and are superior to administrative databases that may report misdiagnoses, therapeutic intervention, and survival.[12,13] The National Trauma Project was set up to study all aspects of trauma management including prehospital care, accident and emergency services, and inpatient management in Iran. This study was performed at 8 cities in accordance with the American College of Surgeons National Trauma Registry System (TRACS) and the National Trauma Data Bank (NTDB). A total of 17 753 patients had referred to trauma centers of these cities and had been hospitalized for more than 24 hours. There were 175 patients (about 1%) with urogenital trauma. Injuries to the urogenital system developed in few traumatic patients in this study similar to the findings of other studies.[13]

The characteristics of the injured patients were comparable with those in the literature and the number of the men admitted to the hospitals was nearly 4 times higher than that of women.[14,15] The age range of 20 to 30 years was the most common age group included in this study and other studies have also reported trauma to be mainly prevalent in men and in productive age groups.[14-16]

Blunt traumas were more frequent than the penetrating traumas. The most common mechanism of the trauma was road traffic accident and pedestrians were the major victims of these accidents (41%). In our study, firearm injury was less frequent than that in other countries. This may be due to the low rate of firearms being available in our country.

Compared with more than half of the patients who had associated injuries, few patients with isolated urogenital trauma were hemodynamically compromised at the time of presentation. Hemodynamically unstable patients are more likely to have multiple injuries. Injuries to the kidney and

Table 3. Outcome of Patients According to ISS*

ISS Group	Survived Patients	Dead Patients	Total
ISS 1 (< 7)	55 (31.4)	0 (0)	55 (31.4)
ISS 2 (7 to 12)	43 (24.6)	0 (0)	43 (24.6)
ISS 3 (> 12)	68 (38.9)	9 (5.1)	77 (44.0)
Total	166 (94.9)	9 (5.1)	175 (100)

*Values in parentheses are percents. ISS indicates Injury Severity Score.

the bladder, associated with other injuries (higher ISS) result in a higher mortality rate. However, it seems that there is no relationship between the severity of the isolated urogenital trauma and the outcome in these patients, a finding that has been previously reported.[6,7] It means that the patient with multiple trauma requires a multidisciplinary approach, preferably by an experienced emergency surgeon.[6,17]

Although nearly all traumatic patients with isolated injuries to the urogenital system survived in this series, management should not be delayed.[17,18] These injuries may lead to urogenital dysfunction, and neglecting them can cause serious sequelae.[19] Kidney was the most common injured organ and nephrectomy was the most common surgical management in this study which may be due to the high prevalence of blunt traumas as the most common mechanism of the injury. Similar to other studies, ureteral injuries due to blunt trauma were the least common injuries.[5,6]

CONCLUSION

Analysis of the present study allows a greater understanding of the urogenital traumas in Iran that are mostly resulted from blunt trauma due to the road traffic accidents. The high frequency of road traffic accidents suggests that planning is required in preventing these injuries. We suggest that an integrated trauma system be established in Iran to improve the quality of trauma care.

CONFLICT OF INTEREST

None declared.

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