

## Trauma outcome of road traffic accident at UAE

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### Abstract

Road traffic accident (RTA) is of growing public health importance worldwide contributing significantly to the global disease burden. Road traffic accidents are a major cause of both internal and external wounds, many of which cannot be treated with simple dressings. There is paucity of published data on road traffic accident in environment of UAE. This study was carried out to describe the injury characteristics and outcome of road traffic accident victims in UAE setting and establishment of treatment protocols. **Materials ad methods:** A total of 100 road traffic crash victims were studied from November 2000 to November 2006, and recorded in Um Aquin hospital UAE depended on the R.T.A Form data on age, sex, nationality, the state of patient in the street, the region of trauma, the nature of injuries, treatment, and outcome were obtained from the registry. **The results:** Road traffic accident constitute a major public health problem in AUE setting and contribute significantly to unacceptably high morbidity and mortality, about 84% male age between 21-31 year old about 29%, occurred in head and neck 43% for one regen 61%, about 81.82 treated surgically with mortality rate 12%. **Conclusion:** Injury is the leading cause of death among young adults using of motor vehicles is growing in UAE a particular concern in emerging nations where increasing urbanization, overcrowding and scant regard for the 'rules of the road' are the standard.

**Keywords:** Road traffic accident, trauma, injury

### 1. Introduction

The trauma in RTA is most serious injury, in 1990, about 5 million people died worldwide as a result of injury (1). It is estimated that by the year 2020, 8.4 million people will die every year from injury, and injuries from road traffic accidents will be the third most common cause of disability worldwide and the second most common cause in the developing world (2).

The road conditions, vehicle safety and driver education, over 3 million persons are injured in motor vehicle accidents each year.(1)

Annually, more than 3.5 million persons in the United States are injured in a motor vehicle accident, and nearly 42,000 die as a result of their injuries.(2)

Study done by Washington, D.C.: National Highway Traffic Safety Administration, National Center for Statistics and Analysis, 1997 about the causes of RTA The result as follow:

Driver factors 57 % 27 %

Roadway factors 6 % 3%

Vehicle factors 3% 2% 1% (3)

Human factors in vehicle collisions include all factors related to drivers and other road users that may contribute to a collision. Examples include driver behavior, visual and auditory acuity, decision-making ability, and reaction speed.

A 1985 report based on British and American crash data found driver error, intoxication and other human factors contribute wholly or partly to about 93% of crashes. (4)

- The evidence shows that the risk of having a crash is increased both for vehicles traveling slower than the average speed, and for those traveling above the average speed.
- The risk of being injured increases exponentially with speeds much faster than the median speed.
- The severity/lethality of a crash depends on the vehicle speed change at impact.
- There is limited evidence that suggests that lower speed limits result in lower speeds on a system wide basis.
- The most crashes related to speed involve speed too fast for the conditions.
- The more research is needed to determine the effectiveness of traffic calming.
- The characteristic features of injury patterns with more than one region injury being the rule rather than the exception.

Maximal care of severely injured patients requires a coordinated approach from the point of accident, through a hospital facility organized to cope with the demands of looking after more than one region injury, to a rehabilitation structure that can return the patient to his or her maximum potential level of function within

society. The present trauma centre systems with in the hospital with sophisticated prehospital and have been shown to reduce the number of preventable deaths after trauma (5), the injury prevention strategies lead to reduce the burden of trauma.

Vehicular bumper impact: in the upright adult, initial impact is usually on the lower limbs

Vehicular windscreen impact: torso and head injuries occur as the pedestrian impacts the body of the vehicle

Ground impact: head, spinal and other collision injuries occur as the displaced pedestrian hits the ground (1).

### **1.1. Pedestrians**

Injuries to pedestrians occur disproportionately among the young (particularly school-aged children), the elderly and the intoxicated (6).

Alcohol and other forms of substance abuse are major associated factors in motor vehicle-related trauma. In South Africa, 7% of drivers with illegal blood alcohol levels account for nearly 30% of non-fatal and 47% of fatal driver deaths, while injury to drunken pedestrians account for 72% of adult traffic deaths (7).

### **1.2. Head injury**

In the western world, the most common cause of death after RTA is severe brain injury. The incidence of death from head injury is approximately 7 per 100,000 (8), and the severely brain-injured also have the highest mean length of stay and mean hospital costs (9).

In a prospective study of nearly 3000 head injuries from Scotland, patients were stratified according to the Glasgow Coma Score (GCS) on arrival at hospital: mild injury (GCS 13-15), moderate injury (GCS 9-12) and severe injury (GCS 3-8).

The major cause of morbidity is head injury; disability may occur whatever the initial severity of the head injury and surviving patients with brain injury are more impaired than patients with injuries to other parts of the body. The prospective cohort study, 2668 had mild injuries, 133 moderate injuries, and 102 had severe injuries. At follow-up after one year, 1397 were still disabled. Of these, 1260 (90%) had been initially assessed as mild injuries (10).

### **1.3. Spinal injury**

The major Trauma Outcome Study estimated the incidence of acute spinal-cord injury at United States to be 2.6% of blunt trauma patients (11).

Initial mechanical trauma includes traction and compression forces, which initiated by the primary injury cause extension of the injury to the spinal cord; damaged tissue releases toxic mediators, which damage intact cells; in particular, the chemical, glutamate, overexcites neighbouring neurons and initiates free-radical-mediated cell damage (12). This process is potentiated by systemic hypotension and hypoxia.

### **1.4. Blunt cervical vascular injuries**

The incidence of blunt carotid injuries in one series from the USA was 1 in every 150 MVAs (13). Injury to the carotid and vertebral arteries after blunt trauma can lead to severe neurological complications in survivors and a mortality rate of 31% (14). Blunt cervical vascular injury should be suspected in patients with:

1. a major mechanism of injury and unexplained paresis
2. unequal pupils
3. cerebrovascular accident or transient ischaemic attack
4. in the presence of a base of skull fracture, major facial or cervical spinal injury (14).

Diagnosis is by cervical angiography, although non-invasive techniques, such as duplex Doppler or CT angiography may also be used.

### **1.5. Thoracic injury**

The thoracic injury directly accounts for 20-25% of deaths due to trauma; thoracic injury or its complications are a contributing factor in a further 25% of trauma deaths (15).

### **1.6. Aortic injuries**

Aortic injuries cause or contribute to 15% of MVA fatalities(16). Most patients with blunt aortic injury die before they reach hospital, and the vast majority will have major coexisting thoracic and extrathoracic injuries(17). Widening of the mediastinum on an admission chest X-ray is the most common first sign of aortic injury(18). Aortography is still the 'gold standard' diagnostic tool; however, contrast enhanced helical CT scanning also compares favourably with aortography(19).

### **1.7. Diaphragmatic injuries**

The incidence of diaphragmatic rupture is about 0.8% - 1.6% of patients admitted to hospital with blunt trauma(20). Between 33% - 70% will be diagnosed on initial chest X-ray, but this is less reliable if the patient is intubated(21).

### **1.8. Abdominal injury**

Splenic injury: The most commonly injured intraabdominal organ following blunt trauma is the spleen (22).

### **1.9. Hepatic injury**

Approximately 85% of all patients with blunt hepatic trauma are stable (23). Individuals subjected to high-speed deceleration in MVAs can experience rupture of intraabdominal hollow viscera. The mechanism of injury is

thought to be compression of closed-loops of bowel by seat-belt restraints. Ecchymosis (bruising) may be seen across the torso in the distribution of the belt, but this finding is not universal. The reported incidence of bowel and mesenteric injuries after blunt abdominal trauma is approximately 1.3%(24).

### 1.10. Pelvic injury

Fractures of the pelvis are increasingly recognised as a marker of severe injury, as the force required to disrupt the pelvic ring is substantial (15). A high index of suspicion must be maintained for pelvic fracture, based on the history of the accident. All patients sustaining high-energy blunt injury should be assumed to have a pelvic fracture until proven otherwise(24).

### 1.11 .Extremity injury

The fractures of long bone mainly the lower limb, which the optimal timing for long bone stabilization in polytrauma patients has been debated(25).

## 2. Materials & Methods

This study is a retrospective study of all patients injured through road traffic accidents from November 2000 to November 2006, and recorded in Um Aquin hospital UAE depended on the R.T.A Form data on age, sex, nationality, the state of patient in the street, the region of trauma, the nature of injuries, treatment, and outcome were obtained from the registry. Medical diagnoses were extracted from the registry and classified based on International Classification of Diseases coding. One hundred patients were consecutively enrolled into the study. Data were collected analyzed using dell computer software version 15.0.

## 3. Results

A total of 100 road traffic crash victims were studied. Their male to female ratio was of 21:4 as in table (1).

sex	No. of patient
male	84
female	16
total	100

Table (1)

The patient's ages ranged from 6 to 69 years with the mean 32.59. The modal age group was 21-30 years, accounting for 29% patients as in table 2.

Age group	male	Female	Total
1-10	1	1	2
11-20	17	3	20
21-30	24	5	29
31-40	24	2	26
41-50	9	3	12
51-60	4	2	6
61-70	5	0	5
Total	84	16	100

Table (2)

The occupation of the victims form the majority of job but most commonly the businessmen (17%) and students (13%) were the majority of road traffic crash victims.

Most victims from the foreign 64% and the nationality 36% as in table (3).

Nationality	Male	Female	Total
U.A.E.	28	8	36
Foreign	56	8	64
Total	84	16	100

Table (3)

The state of patient in the street mostly driver 49% and passenger 42 as in table (4).

State	Male	Female	Total
Driver	45	4	49
Passenger	31	11	42
Pedestrian	8	1	9
Total	84	16	100

Table (4)

The region of trauma at the head and neck alone (43%) were the most common body region injured and then the chest alone (18%) as in table (5).

The region	Male	Female	Total
Head & neck	39	4	43
Chest	16	2	18
Abdomen	3	2	5
Upper limb	1	0	1
Lower limb	2	0	2
Head & lower limb	1	1	2
Head & chest	7	3	10
Head, chest & lower limb	0	1	1
Head, chest & upper limb	1	0	1
Head, chest & pelvis	1	0	1
Head & upper limb	2	0	2
Chest & abdomen	6	1	7
Chest & upper limb	3	0	3
Chest, Upper & lower limb	0	1	1
Abdomen & upper limb	1	0	1
Abdomen & lower limb	1	0	1
Abdomen & pelvis	0	1	1
Total	84	16	100

Table (5)

The number of regions that effect by the accident (61%) one region as in table (6).

The regions	Male	Female	Total
One region	61	8	69
Two regions	21	6	7
Three regions	2	2	4
Total	84	16	100

Table (6)

The injuries open wounds (64%) and the victims had fractures (36%) were the most common type of injuries sustained. From 100 victims (12) die at the same day of accident or the next day the majority of (88) patients (72, 81.82%) were treated surgically and (16, 18.18%) no need for treatment. Internal fixation was the most common procedure performed in (28, 31.82%) of the patients, wound debridement (20, 22.73%), chest tube (18, 20.45%), and abdominal exploration (6, 6.82). (68, 72.27) of victims had completed recovery and (20, 22.73%) had residual defect. The overall average length of hospital stay (LHS) was 14.74 between 1-104 days. Mortality rate was 12%.

#### 4. Conclusion

The first human fatality associated with a motor vehicle was a pedestrian killed in 1899 (26). Road traffic accident constitute a major public health problem in AUE setting and contribute significantly to unacceptably high morbidity and mortality, since then the patterns of injury from man's interaction with the motor car may have been somewhat modified by accident protection devices, such as helmets, seat belts and air bags, but injuries due to road traffic related trauma are worsening each year. Injury is the leading cause of death among young adults using of motor vehicles is growing in UAE a particular concern in emerging nations where increasing urbanisation, overcrowding and scant regard for the 'rules of the road' are the standard.

A recognition of the typical patterns of injury coupled with a logical sequence for the initial assessment and management of trauma patients will contribute to reductions in mortality and morbidity; however, the most significant impact on reducing the worldwide burden of motor vehicle-related trauma will come from injury prevention programs organized at societal and governmental levels.

Urgent preventive measures targeting at reducing the occurrence of road traffic accident is necessary to reduce the morbidity and mortality resulting from these injuries. Early recognition and prompt treatment of road traffic injuries is essential for optimal patient outcome.

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