

Original Article

Buggy (ATV) Accidents - An Emerging Public Health Problem in Kuwait

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ABSTRACT

Objective: To assess the severity of All-Terrain Vehicle (ATV) injuries and its impact on public health in Kuwait.

Design: Retrospective study conducted between January 2002 and August 2003.

Setting: Accident and Emergency (A&E) department of Adan Hospital, Kuwait.

Subjects and Methods: Medical records of 462 consecutive ATV accident victims seen at the A&E department of Adan Hospital were retrospectively analyzed.

Results: Out of 462 patients, 364 (78.8%) were male whereas 98 (21.2%) were female. Their ages ranged from 3.5 to 63 years (mean = 17.8 years). Out of 462 patients,

107 (23%) required admission to the hospital. 18.6% of these admissions (20/107) required ICU care. Fractures of extremities were common among admitted cases (44/107, 41%). Tibia, fibula and femur were the most common bones involved in these accidents. The face was the commonest site of injury in all patients.

Conclusion: The ATV accidents result in significant head injuries, fractures of extremities and skin injuries. Imposing an age limit and implementing state licensing, safety programs and the compulsory use of safety gear are required to reduce mortality and morbidity from this form of recreational riding.

KEY WORDS: all-terrain vehicles, injuries

INTRODUCTION

Pleasure driving of Buggy - an open four wheel motorized all-terrain vehicle (ATV) is becoming an increasingly popular sport in Kuwait.

ATV was first introduced in USA in 1970^[1]. These vehicles have been associated with an increasing mortality and morbidity^[2-4]. The sale of three wheel ATV was banned in 1988^[5], and the sale of four wheel ATV was prohibited to children under 16 years of age. ATV related injuries were relatively unknown in Kuwait before the year 2002. Recently there has been a dramatic increase in the accidents involving ATV's causing an impact on the public health care. The present study was designed to give an overview of the problem as seen in our hospital.

SUBJECTS AND METHODS

This study involved a retrospective analysis of 462 consecutive ATV related injuries seen at the A&E department of Adan Hospital from January 2002 to August 2003. Data relating to these cases were retrieved from the trauma registry of the A&E department and medical records from the ICU and the surgical department. Only those patients for

whom complete clinical data (age, sex, accident details, Glasgow Coma Scale (GCS), duration of hospital stay etc.) was available, were included. Patients who were discharged after first-aid were not included in this study.

OBSERVATION AND RESULTS

Out of 462 cases included in this study, 364 (78.8%) were male and 98 (21.2%) were female. Their ages ranged from 3.5 to 63 years (mean age = 17.8 years, Fig.1). One hundred and seven patients (23%) required hospital admission. The male/female population distribution was 93/14, indicating that males were more likely to be admitted to the hospital (Table 1). The remaining 355 cases (271 male and 84 female) were kept under observation for a short time in the A&E department (Fig. 2). Forty one percent of the admitted cases were less than 16 years of age and 18.6% (20/107) required ICU admission. The mean duration of hospital stay for ICU cases was 6.9 days (1 to 23 days) whereas those treated in the surgical wards stayed for 2.2 days (1 to 15 days).

The commonest mechanisms of injury were either a fall from the ATV or its rollover. A less

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Table 1

Distribution of cases by age group

	< 16 years		>16 years	
	n	%	n	%
A&E (visited cases):	176	38	286	62
n = 462				
M = 364 (78.8%)				
F = 98 (21.2%)				
A&E (treated cases):	132	37	223	63
n = 355 (77%)				
M = 271 (76.3%)				
F = 84 (23.7%)				
Hospital admission:	44	41	63	59
n = 107 (23%)				
M = 93 (87%)				
F = 14 (13%)				
ICU (n = 20)	9	45	11	55
Surgical ward (n = 34)	16	47	18	53
Orthopaedic ward (n = 53)	19	35.5	34	64.2

A & E = Accident and Emergency, M=male, F=female, n=total number

common but significant cause was hitting a stationary or moving object (e.g., another buggy or a car). Almost none of the injured persons (rider or passenger) wore a protective helmet at the time of injury.

Skin injuries were common in all patients in the form of abrasions, lacerations or contusions. The skin on the face and lower limbs was most commonly affected.

Amongst the patients admitted to the ICU, head injury was the most common cause. Based on their admission Glasgow Coma Scale, they were graded as mild (n = 5, 25%), moderate (n = 3, 15%) and severe head injuries (n = 10, 50%). 15% (3/20) of patients admitted to the ICU died. Isolated brain edema was seen in 30% (6/20) cases and isolated skull fracture in 15% (3/20) patients. Only two patients (10%) required surgical intervention (craniotomy) for evacuation of an intracranial hematoma. Two patients (10%) admitted to ICU had no brain injury (GCS- 15/15) but had multiple limb and vascular injury and required ICU care.

Amongst patients admitted in the surgical ward (n = 34), skin injury was the commonest (15/34 = 44%). More serious injuries include five patients (5/34 = 14.7%) with fracture of skull bone without significant brain injury and four (4/34 = 11.7%) with faciomaxillary injuries involving facial bones including fracture of maxilla and mandible. Two cases of fracture mandible with broken teeth required surgical fixation. Other patients sustained fracture of the nasal bone, orbital bone and zygoma which required no intervention. There were three cases of broken teeth without bone fracture.

Two patients sustained neck injuries. One with a deep lacerated wound (caused by striking against the rope of a tent) and the other had a contusion

Table 2

Details of bony injury among admitted cases

	Upper limb		Lower limb		Spine Fracture	
	Fractures	Dislocation	Fractures	Dislocation		
Clavicle	7	Elbow 1	Pelvis	1	Knee 1	Cervical 3
Humerus	6		Femur	11	Ankle 1	Dorsal 3
Radio/Ulna	1		Tibia/Fibula &			Lumbar 2
Hand Bones	1		ankle bones	19		
			Foot Bones	3		

N.B. There could be more than single injury in one case.

(blunt trauma) over anterior part of neck (due to the head cover causing strangulation).

There was one case of chest injury with fracture of ribs and pneumothorax, and one blunt abdominal injury without significant involvement of intrabdominal organs. Eight patients had no significant injuries but were admitted for observation, for a mean duration of two days.

Amongst patients admitted in the orthopedic ward (n = 44, 41%), fractures of extremity bones was a common injury. Fractures of tibia and fibula were more common than that of femur and humerus (Table 2). Spinal injuries were observed in eight patients. All were stable fractures without serious neurological manifestations.

DISCUSSION

The sale of ATV to persons under 16 years of age is prohibited in the USA since 1988 due to the recommendations of the Consumer Product Safety Commission (CPSC) report to reduce ATV related injuries^[6,7,8]. In 2001, this CPSC report revealed a significant increase in injuries due to ATV since 1997 including 495 deaths in 2000 and a total of 11,700 ATV related injuries reported from emergency departments in 2001^[5]. Injuries due to ATV during the same period, were observed less frequently in UK and Ireland^[2].

The present study reveals that ATV related injuries are associated with significant mortality (15%) among patients admitted to the ICU. The mortality among all hospital admission was 2.8%. This is well within the reported mortality of 1-10.7%, from ATV accidents^[5,9,10]. In our ICU, 158 cases of Motor Vehicle Accident were admitted during the study period. Mortality in this group was 17.7% which is not much different from ATV mortality. These figures highlight the seriousness of ATV injuries in the community.

A large proportion of head injuries in our study are related to riding the buggy without a helmet. Use of protective helmet is not required by the law. Use of helmet can significantly reduce mortality and morbidity as reported by Rodger in 1990^[11].

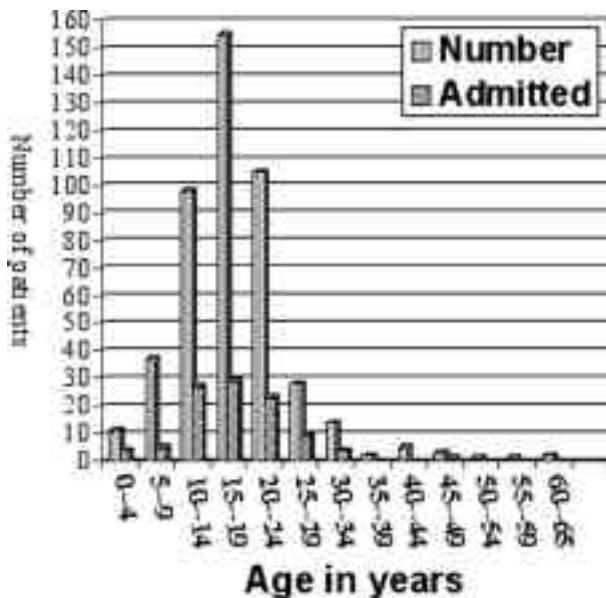


Fig. 1: Distribution of patients in 5 year age groups. The dotted bars show the number of patients admitted to the hospital.

Moreover, buggys (ATV) are meant to be off-the-road vehicles^[10,12,13]. Unfortunately, they are driven both, in desert areas and on the streets in Kuwait.

High proportion of ATV related injuries to head, spine, and faciomaxillary areas require costly imaging investigations. ICU care and prolonged hospital stay consume hospital resources^[10,14]. In a study involving 130 children under 16 years of age involved in ATV related accidents in the USA, it was estimated that the cost of hospitalization and treatment was in excess of \$ 1.6 million^[7]. Kuwait is already known to have a higher rate of mortality and morbidity related to road traffic accident in the world. The Traffic Department of Kuwait has reported that in 1999, there were 333 deaths from 26,635 vehicle accidents in a population of 2.2 million. Another report from the General Traffic Department of Kuwait showed 164 deaths out of 13,599 road traffic accidents in the first half of year 2000.

Skin injuries, lacerations, contusions and abrasions over large parts of the body are very painful^[15,16]. The incidence of facial bony injuries in our study is lower than reported elsewhere (which is partly due to the fact that use of alcohol is not reported here)^[12,17,18].

Extremity fractures were slightly higher than reported. Lower extremity fractures were more common than upper extremity fractures which is consistent with the findings of other studies^[8].

Our retrospective study has some limitations as the exact number of accidents, whether the injured was a rider or a passenger, and the mechanism of the accident (rollover, collision, fall from the buggy

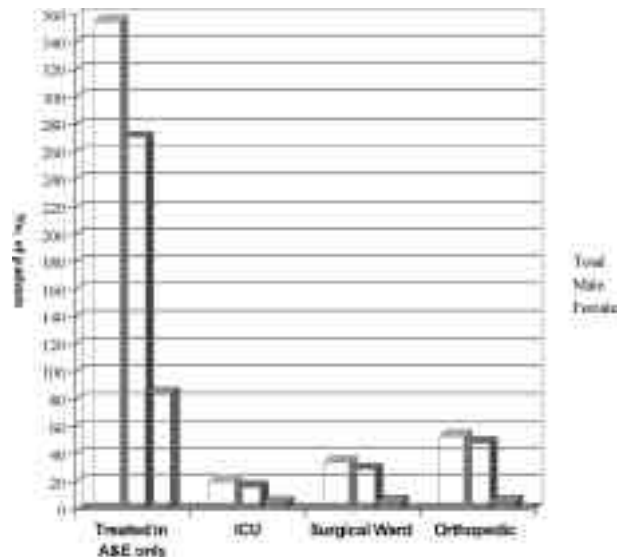


Fig. 2: Sexwise distribution of patients showing the place where they were admitted and treated

etc.) were not recorded in the patient files. Those patients with simple fractures of extremity bones, who were discharged from the A&E, were also not recorded in the trauma register.

CONCLUSION

ATV related injuries is a serious problem. There is an urgent need for implementation of strict regulations by the traffic department such as to limit the use of such vehicles, enforce the wearing of helmets and observe other safety measures on the road.

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