Short Communication

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Pediatric Unintentional Injuries in North of Iran

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Abstract

Objective: Since the beginning of the 21st century, injury has been the most serious public health problem that children face with. The aim of this study was epidemiologic evaluation of unintentional injury in north of Iran.

Methods: In a prospective cross-sectional study between September 2005–July 2006 we studied data of 347 trauma patients aged 14 years and younger, including sex, age, trauma mechanism, transportation facility, anatomical sites of injury, severity of head injury according to GCS (Severe: 3-8, Moderate: 9-12, Mild: 13-15), injury severity score (ISS), and length of hospital stay (LOHS). SPSS 13 and independent t-test were used to analyze of data.

Findings: Out of 3605 trauma patients, 353 were 14 years old or younger with a mean age (SD) of 7.6 (4.0); Male to female ratio about 2:1. Most of them (42.9%) were 1-5 years old. In patients younger than 1 year, falling was the most common (52.2%) mechanism of trauma while in other groups, traffic accidents were the leading cause of injury. About half of the patients were transported to hospital by their families or other people. About 77% of them suffered from head injury. Mean (SD) ISS was 4.3 (6.6), about 12% had severe injury and it was more than 25 in about 3%. Mean (SD) LOHS was 5.1 (8.9) days.

Conclusion: Occurrence of falling and traffic accidents in children is remarkably high. Mainly traffic accidents are preventable. We suggest paying more attention to safety education in all levels of community.

Key Words: Injury Severity Score; Car accident; Falling; Children; Trauma; Epidemiology

Introduction

Since the beginning of the 21st Century, injury has been the most serious public health problem that children face. Pediatric trauma continues to be one of the major threats to the health and well-being of children. Injury is the leading cause of death for children over 1 year

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of age, exceeding the combined total of deaths from all other causes[1].

In fact, for children, injury exceeds all other causes of death. Death from unintentional injury accounts for 65% of all injury deaths in children younger than 19 years. Several factors influence childhood injuries, including age, sex, behavior, and environment. Age and sex are the most important factors affecting the patterns of injuries[2]. Unintentional injuries are major causes of childhood mortality and morbidity in the United States[3]. Since the 1940s, unintentional injuries have caused more deaths per 10,000 in children aged 1 to 19 years than all infectious diseases and now account for 44% of all childhood deaths[4]. Although unintentional injury deaths have declined by >40% during the past 2 decades[5], about 20.6 million children in the United States are injured each year, resulting in a nonfatal injury rate of 25 per 100 children[6]. According to a national report on vital statistics in Iran, after chronic heart disease, injuries are the common cause of death in different age groups[7].

Due to lack of organization and funding, the data capture system in Iran is inadequate[8,9]. Injuries are similarly the leading cause of death for children aged 1 to 14 years throughout the developed world[10].

Thus, pediatric trauma continues to be one of the major threats to the health and well-being of children. It is critical to understand the epidemiology of injuries because it can provide direction in planning and implementation of prevention programs[1]. The aim of this study was epidemiologic evaluation of unintentional injury in children in north of Iran.

Subjects & Methods

Poursina Hospital is the main trauma center in Guilan province in north of Iran. More than 118 thousand patients are visited and more than 15 thousand trauma admissions are recorded each year. Data of trauma patients included demographics, anatomical injury diagnosis, and cause of injury, severity of trauma according to Injury Severity Score (ISS), Glasgow Coma Scale (GCS), and Length of Hospital Stay (LOHS).

About 347 patients in age group less than 14 years have been registered by GTRC since September 2005 - July 2006. Patients' data are collected at admission by clinical and trauma data coordinator of GTRC.

Children were categorized in four age groups as bellow: Younger than 1 year (Infant), 1-5 years (Preschool), 6-11 years (Elementary school) and 12-14 years (Middle school). Trauma mechanism was categorized as below: Traffic accidents, fall, assault, burn and animal attack.

Data coordinators assigned scores from the Abbreviated Injury Scale (AIS-90). We defined trauma scores according to GCS (severe: 3-8, moderate: 9-12, mild: 13-15), ISS (>12: severe, 7-12: moderate, <7: mild), also patients with high risk of death were specified (ISS>25).

Data was analyzed using SPSS software (version 13). All descriptive values are reported as mean (and standard deviation). We used independent t-test to compare age distribution and chi square to compare categorical age group for falling and traffic accident.

Findings

In this study, mean age of patients was 7.6 (4.0); 240 (68.5%) children were male, with male to female ratio 2.1:1. Age groups less than 6 years 118 (33/5%), and 6-11 years 153 (43/4%) had the highest proportion in different injuries.

Road accidents caused injuries in 232 (65/7%) children, being the highest rate of trauma. In patients younger than 1 year, falling was the most frequent (52/2%) mechanism of trauma. However, traffic accidents were the leading cause of injuries overall. Table 1 shows injury mechanisms and age groups in falling and car accidents. There was a statistically significant difference between age and injury mechanisms (P<0.001). Stairs

Table 1- Frequency of injury mechanisms and age groups in children in north of Iran

Age groups (Y)	Car accident	Fall	Other	Total
Under 1	9 (39.1%)	12 (52.2%)	2 (8.7%)	23 (100%)
1-5	60 (63.2%)	26 (27.4%)	9 (9.5%)	95 (100%)
6-11	105 (68.6%)	22 (14.4%)	26 (17%)	153 (100%)
12-14	58 (70.7%)	11 (13.4%)	13 (15.9%)	82 (100%)
Total	232 (65.7%)	71 (20.1%)	50 (14.2%)	353 (100%)

were the most common (25.5%) site that patients fell from (Fig 1).

Mean (SD) age in car accident was 46.5 (96.2) vs 49.5 (68.4) month in falling mechanism. This difference was significant, statistically (P<0.001). Traffic accident was significantly more in males rather than in females but occurrence of falling was similar in both genders (Table 2). Most of events (193 cases, 54.7%) occurred in urban areas. Mean (SD) ISS was 4.3 (6.6). It was lower than 7 in 77.8% patients, 7-12 in 9.93%, 13-25 in 8.18% and more than 25 in 3.5% of patients. Head injury according to GCS was mild in 80%, moderate in 8.8% and severe in 11.2% of patients.

Anatomical site of injury was: Head and neck 272 (77.2%), pelvis 40 (11.3%), face 23 (6.7%), spine 8 (2.3%), chest 5 (1.2%), and abdomen 5 (1.2%). Mean (SD) LOHS was 5.1 (8.9) days with lowest duration one day in 45% of patients and highest duration 75 days in 0.6% of children. Eight patients (2.3%) died, that 5 (62.5%) of them were injured in urban areas.

Discussion

Our findings reinforce the importance of unintentional events as a major cause of injury in children. Each year approximately 1 in 4 children experience an injury that is severe enough to require medical attention, school absence, and/or bed rest. Alterman et al[2] explain that several factors influence childhood injuries, including age, sex, behavior, and environment. Of course, age and sex are the most important factors that affect the patterns of injuries. Male children younger than 18 years have higher injury and mortality rates. Head injuries, either alone or in associate with multiple system injuries, were the most frequent causes of death[2]. We have obtained similar results; number of males was more than females and head was the most frequent anatomical site of injury.

Berger and Mohan showed that the major types of injuries in developing countries are traffic accident, fall, drowning and poisoning[9]. In our study, the main mechanisms of injury after first year of life were traffic accidents. In infancy, falling was more common but with no significant difference from traffic accident.

Soori and Naghavi explained that unintentional injuries are the main cause of death in rural area[8] but in our study most of unintentional injuries leading to death occurred in urban areas. Low number of patients with high ISS does not reduce the importance of paying attention to management of these patients.

Table 2- Difference of falling and traffic accidents by gender

Trauma mechanism	Male	Female	Chi square	*P*-Value
Traffic accident	169	62	49.56	0.00
Falling	49	36	1.98	0.15

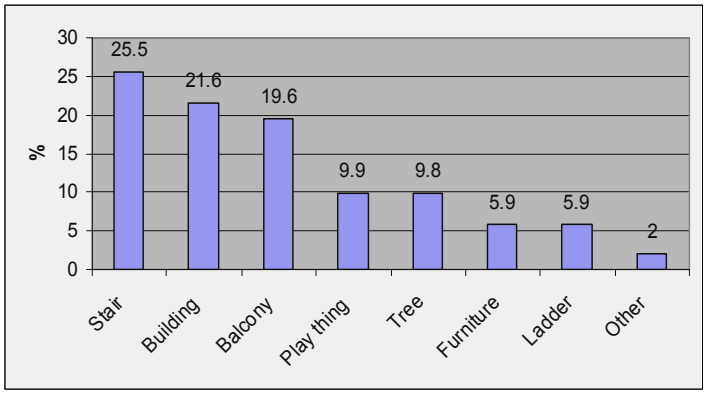

Fig 1- Different sites that children fell from (n=85)

Iran has achieved good results in reducing morbidity and mortality from infectious diseases by 15 years of dedicated effort but, number of accidental death have been increased. About 30 years ago, the European Office of World Health Organization suggested that countries should have a central institution, governmental or non-governmental, designated for child safety[8]. There is no injury organization, funding, or data capture system in Iran at present[2]. Injury related policies must be considered as a priority health problem in this country, and a well organized system must be established for childhood accident prevention. National efforts may enhance the chances of prevention and control of these injuries in Iran.

Conclusion

Regarding remarkable occurrence of falling and accidents in children, which is preventable, more attention should be paid to preventing of accidents in this age group. Educational effort in school, home and community must focus more on prevention. Evidence from the preventable nature of accident deaths presents strong arguments in favor of better organization for trauma care and enforcing public health education.

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