Background: Many studies have recently noted a shift in the causative mechanism of facial injuries away from traffic accident to assaults. AIMS: Our study aimed to investigate patterns of facial injuries in trauma patients during 13 months study of trauma patients in six general hospitals in Tehran. Material and methods: Trauma patients who were hospitalized for more than 24 hours and had sustained injuries within seven days from admission were included in the study. Of the 8000 trauma patients, four hundred (5%) sustained facial injuries. Results: Male to female ratio was 4.5:1. Among them, 53.3% were aged 11-30 years. Traffic accidents were by the far the commonest cause of injury. Motorcyclists who wore a helmet sustained facial fractures less often during traffic accident than those patients who did not wear helmet. Soft tissue injury and facial bone fracture comprised 43.3% and 40.8% of facial injuries, respectively. The majority of Soft tissue injuries (79%) were located extra orally. The mandible and nasal bone were the most commonly fractured facial bones. Victims of assault sustained more severe injuries compared to those involved in falls and traffic accidents. Conclusions: Use of helmets by motorcyclists and the separation of pedestrians routes from motor vehicles could reduce the number of victims and consequently injuries due to road traffic accidents. For implementation of effective prevention programs for reduction of facial injuries due to assault, it seems to be necessary to conduct studies investigating causes and pattern of injuries resulting in assault.

KEY WORDS: Trauma, facial injury, Severity.

INTRODUCTION

The human face constitutes the first contact point in several human interactions, thus injuries and/or mutilation of the facial structures may have a disastrous influence on the affected person. There have been many reports on the epidemiology of facial injuries. Previous studies reported traffic accidents and falls as the main causes of facial injuries.\(^1\)\(^-\)\(^4\) Although recently many studies have reported a shift in the cause from traffic accidents and falls to blunt assault.\(^5\)\(^-\)\(^7\) The management of fractures to the face remains a challenge for oral and maxillofacial surgeons, demanding both skill and a high level of expertise. A clearer understanding of the patterns of facial injuries will assist health care providers to plan and manage the treatment of traumatic facial injuries. Such epidemiological information can also be used to guide the future funding of public health programs geared toward prevention. This study was designed to investigate of facial injuries seen in trauma patients admitted in six general hospitals during 13 months of study.

MATERIAL AND METHODS

The study population included trauma patients admitted to emergency rooms in six general hospitals in Tehran during the 13 months trauma registry (From August 23 1999 to September 21 2000). These included all cases that sustained an injury within a week prior to presentation to emergency rooms (ERs) and were hospitalized for more than 24 hours. The patients who suffered from burns and toxicities were excluded, since there are other specialized referral hospitals for these patients in Tehran. The data was collected through a questionnaire, designed in Sina Trauma and Surgery Research Center (STSRC) was used for the study. The questionnaires were completed by trained physicians visiting trauma patients in emergency room and wards round the clock. Data obtained included patient demographics, level ofprehospital care, medical and operative procedures performed in emergency rooms (ER) and wards (according to ICD-10 coding), Glasgow Coma Scale (GCS) and vital signs at time of presentation to ERs, Injury Severity Score (ISS), length of hospital stay and Intensive Care Unit (ICU) admission if any, outcome of treatment if any and source of reimbursement. The injury and mechanism of accidents classified based on ICD-9 (international classification of disease and related health problems). Statistical analysis was performed using the SPSS software for windows Statistical analysis using the $X^2$ method and a $P<0.05$ was accepted as being statistically significant.

RESULTS

Demographic details

Facial injuries accounted for 5% (400/8000) of all patients attending the emergency departments of six general hospitals during the 13 months period of study. The mean age was 30.2 with a range from 2 to 85 years. Males outnumbered females in all age group with male to female ratio of 4.5 to 1 ($x^2$ 40.64, df =8, $P<0.02$). The proportion of male patients was significantly higher in the second and third decade. The most common place of injury occurrence was the street with 216 cases (54.0%), followed by road (highway and out of cities) and home with 75 (18.8%) and 54 (13.5%), respectively. Workers (included industrial and construction worker) were the dominant occupational category with 98 cases (24.5%), followed by students and employments (official workers) with 75 (18.8%) and 51(12.8%), respectively.

Etiology

The causes of facial injuries were varied (Table 1); however, the primary causative factor was traffic accident with 274 cases (68.5%) and fall was the second most frequent cause of injuries with 80 patients (20.0%), followed by assault (36[9.2%]) (Table 1). Pedestrians colliding with cars formed the commonest form of road traffic accident accounting for eighty...
cases. Motorcyclists who wore a helmet sustained facial fracture less often during traffic accidents than those patients who didn’t wear helmet. Unfortunately, only one motorcyclist (0.3) was worn helmet at time of accident. Of patients who were occupants of cars, 53 cases were front seat passengers at the time of accidents and only 3 cases had used seat belts. Only 71 (17.8%) of the sample were aged 16 or younger and TA (62.0%) was the main cause of facial injuries in this group (Table 2).

### Type of injury

From our patients, 197 cases had open wound (Table 3). Among them, 170 patients were purely sustained open wound, while 27 cases had sustained open wound with associated to dental or facial bone fracture. The majority of open wounds (79%) were located extra orally (Table 4). Facial bone fracture comprised 40.8% of sustained injuries in our patients (Table 3). Mandibular fracture was the most common facial fracture with 53 cases (12.9%), followed by nasal bone with 56 cases (12.3%).

### Severity

On analysis of injury severity, 314 cases (78.5%) of all cases had AIS1 (minor), 80 patients (20%) had AIS2 (moderate) and AIS3 (severe) was rare with only 8 cases (1.5%) (Table 5). Victims of assault were sustained more severe injuries comparing to those involved in a fall and TA. Only 12 victims of assault had AIS1.

### Others

Over fifty nine percent of patients were presented to ERs within the first 2h of sustaining their injuries (mean=7h). A total of 40% of patients were discharged from the hospital within 48 h of presentation and by the end of the first week, 71.4% of the patients had been discharged. Twelve patients died resulting to severity of injuries. Head trauma was the main cause of death in 10 cases and eight of them were sustained injury due to TA. Among our patients, 146 cases (36.5%) had received prehospital care. Most of falls had occurred in the third month of summer. All patients had the clinical diagnosis confirmed by radiograph. Computed tomography scan was taken for 176 (44.0%) patient mainly sustained head trauma.

### DISCUSSION

The vast majority of facial injuries (81.8%) in our study were experienced by males and patients aged 21 to 30 constituted the group with the highest frequency of facial injury, findings that are consistent with previous studies.8-10 Reported over all ratios of males to females in previous study have ranged from 3:1 to 5.4:1,11-12 similar to the ratio observed here (4.5:1). Traffic accident was the main cause of facial injuries. This is in agreement with studies achieved by Convington13 and Afzeliud14 but differs from the trend shown by Huge15 and Magennis.2 Pedestrians with 109 cases (27.3%) comprised the greatest proportion of our patients and near seventy four percent of them were sustained injuries in collision with cars. Physical separation of pedestrians from vehicles, pedestrian crossing signs and zebra crossing, improving the road-
way lighting especially at night and educating people to obey the traffic rules are the most important strategies that can lessen the magnitude of the pedestrian-related injuries. The second most common kind of TAs was motorcycle crashes. Recent studies have shown the positive effect of mandatory helmet use laws on mortality and morbidity.\textsuperscript{16-17} A mandatory helmet law does not currently exist in our country and voluntary helmet use is low. Clearly, a national mandatory helmet use law is needed to reduce the associated morbidity and mortality associated with riding a motorcycle without a helmet. There have been few studies including both fractures and soft tissue injuries in the craniofacial or facial region. Most studies on facial trauma have been focused on a particular age group such as, children or investigated special kind of injury (fracture or soft tissue injury). Our study involved all age group and comprised facial fracture and soft tissue injury and soft tissue injury was by far the most common type of facial injury. The most common type of fracture in our patients was mandibular fracture with 59 cases (12.9\%) followed by nasal bone fracture 56 (12.3\%). Location of soft tissue injuries and kind of facial fractures are in agreement with previous studies. Comparison of the severity scores shows that victims of assault were sustained more severe injuries than other patients. Young males sustained more and severe facial injuries.

\section*{CONCLUSION}

The proportion of male patients grew significantly in second and third decade of age. Overall, the vast majority of injuries in our patients are mild to moderate. Traffic accident was the main cause for the majority of our patients but victims of assault were sustained more severe injuries than other patients. Young males sustained more and severe facial injuries.

\section*{REFERENCES}