Dento-alveolar and maxillofacial injuries – a retrospective study from a level 1 trauma center in Israel

Lin S, Levin L, Goldman S, Peled M. Dento-alveolar and maxillofacial injuries – a retrospective study from a level 1 trauma center in Israel.

Abstract – To evaluate the frequency and causes of dental and maxillofacial trauma in hospitalized patients. From January 1, 2000 to December 31, 2003, data from hospitalized trauma patients in a level 1 trauma center in Israel were analyzed according to age, gender, time, place, and cause of injury. Maxillofacial and tooth injuries were separated and further analyzed according to the above parameters. The analysis was based on data from the Israel Trauma Registry (ITR). Of all 14 040 trauma patients, 1038 (7.4%) involved maxillofacial or dental injuries. Common causes of injury were motor vehicle crashes (41%), falls (27%) and intentional injuries (23%). Fifty percent occurred on the street/road, 17% at home and 14% in public buildings. Surgery was required in 55.5% of all maxillofacial injuries. Males were hospitalized three times more than females, and young people, ages 19–28, were at greatest risk (30.2%). Oral and maxillofacial trauma is common, requiring dental health training for primary caregivers.

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Dental and maxillofacial trauma is not uncommon (1–5). In a large cohort study of 10 436 patients treated at the hospital emergency room as a result of a traumatic episode, 765 (7.3%) had sustained injuries to structures of the oral cavity. The leading cause of dental injury was falls, accounting for 55.8% of the injuries (1). In addition to the physiological outcome, economic and psychological components accompany these injuries. These traumatic injuries, beyond their direct effect on the afflicted patient, have additional consequences, including interruption of daily activity, long-term treatment, and often lead to financial burden. Furthermore, traumatic oral and maxillofacial injuries could have a detrimental psychological effect on the injured person and their associates (5).

Prompt and appropriate management is necessary to significantly improve prognosis for many dento-alveolar injuries (6–8). Treatment of oral and maxillofacial injuries requires fastidious diagnosis and coordination between all treating professionals from the moment of injury. Although dental injuries occur at every age, sports-related dental injuries among children aged 8–14 years are most common (4, 5, 9). However, the main causes of maxillofacial trauma have changed over the past 15 years (10). A proportion of oral injuries can be prevented if the risk factors and etiology are better understood. This knowledge is essential for developing and implementing effective prevention.

The purpose of the present study was to determine the extent of oral and maxillofacial trauma in a large trauma center in Israel and to assess the causes of injury and its relation to age and gender.

Methods

This is a retrospective cohort study of patients recorded in the Israel Trauma Registry (ITR) from January 1, 2000 to December 31, 2003. The ITR records all hospitalizations for physical trauma at 10 trauma centers, in-hospital deaths, and transfers to another trauma center in Israel. In this study, data refer to only one level 1 trauma center, and included all trauma patients with the following injury codes according to the abbreviated injury scale (AIS): 243400.1–251800.2 and 243099.1. Data were analyzed according to age, gender, and etiology of the injury, time, and place of the injury. A total of 14 040 trauma files were reviewed. Maxillofacial and tooth injuries were separated and further analyzed according to the above parameters. The descriptive analysis was processed by using SAS 8.12.

Results

Of the 14 040 patients admitted with trauma injuries during the years 2000–2003, 1038 (7.4%) patients were admitted with maxillofacial or dental injuries. Of these, 576 (55.5%) required surgery. The main causes of these injuries are shown in Table 1. The most common cause was a motor vehicle crash (41%), followed by a fall (27%) and an intentional injury (23%). Fifty percent of the injuries took place on the street/road, 17% occurred at home and 14% in public buildings (Table 2).

Distribution of maxillofacial injuries by age and gender is shown in Table 3. Males suffered from these injuries three times more than females. Facial injuries were most prevalent among adults, 19–28 years (30.2%). Multi-organ injuries involving the maxillofacial area were also common.

Discussion

Maxillofacial injuries are quite significant. In certain cases, the injury may not be severe (e.g. rupture of the alveolar ridge) and may not pose a risk to life, but the long-term effect could be serious, particularly from a psychological point of view. Distortion of the face or tooth area and functional disorders, such as speech and mastication difficulties, are often the result of these injuries. In a previous study aimed at revealing the etiologic factors related to dental injuries in Norwegian youth, aged 7–18 years, 4% of all injuries were classified as severe, in which only one-third might have been preventable (11). It was concluded that because of the complexity of these factors, it is neither easy to prevent oral and maxillofacial injuries nor to make guidelines on prevention. These findings emphasize the importance of disclosing the risk factors and causes of maxillofacial trauma for effective prevention.

Table 2. Place of trauma occurrence

Place of event	Maxillofacial trauma		
	Without tooth involvement (%)	With tooth involvement (%)	Total (%)
Street/road	428 (48.9)	87 (53.7)	515 (49.6)
Home	154 (17.6)	23 (14.2)	177 (17.1)
Public building	126 (14.4)	17 (10.5)	143 (13.8)
Industrial area	39 (4.5)	9 (5.6)	48 (4.6)
Sports area	25 (2.9)	4 (2.5)	29 (2.7)
Other	104 (11.9)	22 (13.6)	126 (12.1)
Total	876	162	1038 (100)

Table 3. Trauma distribution according to age and gender

Age*/gender	Without tooth involvement (%)	With tooth involvement (%)	Total
0–9	114 (13.0)	19 (11.8)	133
10–18	113 (12.9)	53 (32.9)	166
19–28	256 (30.3)	48 (29.8)	313
29–38	139 (15.9)	23 (14.3)	162
39–48	91 (10.4)	12 (7.5)	103
49–58	54 (6.2)	4 (2.5)	58
>59	99 (11.3)	2 (1.2)	101
Males	700 (79.9)	117 (72.2)	817
Females	176 (20.0)	45 (27.8)	221
Total	876	162	1038

*There are two missing reports in the age distribution.

Table 1. Causes of trauma among all patients admitted with trauma injuries during the years 2000–2003

Cause of trauma	Maxillofacial trauma			Total trauma files (%)
	Without tooth involvement (%)	With tooth involvement (%)	Total (%)	
Motor vehicle accidents	346 (39.5)	78 (48.2)	424 (40.9)	3563 (25.4)
Falls	243 (27.7)	41 (25.3)	284 (27.4)	6792 (48.4)
Burns	0	1 (0.6)	1 (0.1)	513 (3.7)
Other unintentional injuries	80 (9.1)	13 (8.0)	93 (9.0)	1704 (12.1)
Intentional injuries	207 (23.6)	29 (17.9)	236 (22.7)	1465 (10.4)
Total	876	162	1038	14040 (100)

Maxillofacial or tooth-related injuries were observed in 7.4% of all patients hospitalized with trauma injuries, which is a large proportion of trauma cases. Primary care providers (e.g. family physicians, pediatricians, nurses, physician assistants, etc.) could play a crucial role in the provision of primary care following dental trauma. Special emphasis should be given to provide primary caregivers with the relevant education to improve their knowledge and ability to deal with the diagnosis and treatment of dental trauma (12).

Furthermore, the etiology of theses injuries should be further studied and the general population should be educated in methods to prevent future cases. In the present study, the most common cause of maxillofacial injuries was motor vehicle accidents. The incidence was highest among adults, aged 19–28, which differed from previously reports (4, 5, 9). This may be due to the increase in motor vehicle crashes among young adults, soon after receiving their driver's license. Public health campaigns can provide better awareness, not only of the dangers of traffic accidents, but also to the long-term outcomes.

Falls and intentional injuries were also common causes. Likewise, appropriate intervention programs should be developed and implemented, which could be beneficial in reducing the risk of oral and maxillofacial–related injuries.

Most injuries required surgical intervention, data that can serve as an indication on the severity of those injuries.

A limitation of this study was that the analysis included data from only one trauma center. Further research, preferably using multi-centred data, is warranted. However, despite this limitation, the data emphasizes a need for further dental health education and training for primary caregivers.

Conclusions

This study provided a profile of oral and maxillofacial injuries among hospitalized patients. Young adults, 19–28 years, are at greatest risk for these injuries, especially when involved in a motor vehicle crash. Data from this study should be used as a baseline to plan, develop, and implement dental health programs for primary caregivers and for high-risk populations.

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