ORIGINAL ARTICLES

Sport-related oral and maxillofacial trauma: Retrospective review of 317 patients

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Received: March 1, 2016 **Accepted:** May 8, 2016 **Online Published:** May 13, 2016
DOI: 10.5430/css.v2n3p10 **URL:** http://dx.doi.org/10.5430/css.v2n3p10

ABSTRACT

Objective: The recent increase in worldwide sporting participation ensures sport-related traumatic injuries, including those affecting oral and maxillofacial anatomy, present more frequently to Accident and Emergency (A&E) departments. The aim of this study was to review aetiological, epidemiological and seasonal data on sport-related oral and maxillofacial trauma.
Methods: A two year retrospective review of the Oral and Maxillofacial Surgery (OMFS) trauma database of a busy regional maxillofacial unit (RMU) in the United Kingdom (UK).
Results: Of patients requiring hospital assessment and/or treatment for traumatic facial injuries, 317 (5.9%) identified sporting physical activity as the mechanism of injury with a male: female ratio of 8.4: 1. Adolescents and young adults (11-20 years) (n = 108; 34.1%) all at amateur level, were most commonly involved. Late autumn (October) and early spring (March) observed the highest prevalence of injury presentations. Sixty (18.9%) patients were admitted for reduction and fixation of facial fractures.
Conclusions: An increase in sport-associated injuries, including serious facial injuries, is recognised and appears to be affecting predominantly young male adults at amateur level. Prospective investigation to predict orofacial injuries associated with commonly played sports and to consider the efficacy and implementation of protective safety equipment is the need of future essential research.

Key Words: Sport, Facial, Orofacial, Injury, Trauma

1. INTRODUCTION

The consensus, that increasing global sporting participation has seen a recent upsurge in sport-related injuries including oral and maxillofacial trauma is well documented.[1–6] The prevalence of orofacial trauma secondary to sporting participation in contemporary European studies varies from 4%[4] to 6%,[2] increasing to 21.7%[5] in areas of Australasia, highlighting the regional and cultural variation in sport activity and ultimately injuries as a consequence thereof.

Aims

In view of the scarcity of United Kingdom (UK) based literature,[3] the aim of this study was to review aetiological, epidemiological (age and sex) and seasonal data on sport-related oral and maxillofacial trauma. The subsidiary aim was to identify the type of facial injuries associated with the most popular sports of soccer and rugby and to consider the need for a future prospective study to predict injury patterns associated with these sports in the UK.

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2. Materials and Methods

A retrospective review of the departmental Oral and Maxillofacial Surgery (OMFS) trauma database was undertaken. All consecutive adult and paediatric facial trauma patients presenting to or referred to the unit over the two year period were considered for inclusion.

2.1 Inclusion

Inclusion criterion was all consecutive adult and paediatric facial trauma patients referred to OMFS with sport-related facial injuries for further assessment and/or management within the set two-year period of review.

2.2 Methodology

Standardised trauma data completed by junior colleagues at the point of referral or presentation was logged in a password activated local electronic database at regular intervals. Data pertaining to patient age, sex, mechanism of injury, location where injury occurred and injury sustained were retrieved and analysed.

Data were analysed to identify the age and sex of patients sustaining orofacial trauma secondary to physical activity and the venue where injury occurred. Further information on the month when the injury was sustained and the type of sporting activity responsible was considered. Concomitant injuries, documented on subsequent review of admission case notes, were included.

2.3 Referral source

All referrals from the emergency room (ER), community family medical practitioners and dental practitioners were included in this cohort review.

Audit of trauma data forms at the time of study identified 95% completion rate.

3. Results

Over the two-year period of review, 5,362 consecutive adult and paediatric patients presented to the department with traumatic orofacial emergencies. Of these, 317 (5.9%) reported injury secondary to sporting physical activity. Interpersonal violence (n = 2,876; 53.6%) and falls (n = 1,469; 27.4%) were the two most common causes of facial injury presenting to the department.

3.1 Demographics

Patient sex, age and geographical location of sport-associated injury are detailed in Table 1. The ratio of injured male to female patients was 8.4: 1. Patients involved ranged from six to seventy-eight years old, with adolescents and young adults (11-20 years) (n = 108; 34.1%) most commonly involved. Sporting injuries sustained in designated sporting arenas (n = 258; 81.4%) predominated.

Table 1. Sex, age and venue of sports-related facial trauma

	n	%
Sex		
• Male	277	87.4
• Female	33	10.4
• Not recorded	7	2.2
Age (years)		
• 0-10	23	7.3
• 11-20	108	34.1
• 21-30	93	29.3
• 31-40	53	16.7
• 41-50	21	6.6
• Above 50	12	3.8
• Not recorded	7	2.2
Venue		
• Sports arena	258	81.4
• Home	11	3.5
• School	13	4.1
• Street	25	7.9
• Other	7	2.2
• Unknown	3	0.9

3.2 Seasonal variation

Month of presentation to identify any seasonal variation in presentation is depicted in Figure 1. As illustrated the majority of sport-related facial injuries occurred in late autumn (October) and early spring (March) with fewer presentations in the mid-summer months of June, July and August and mid-winter months of December and January.

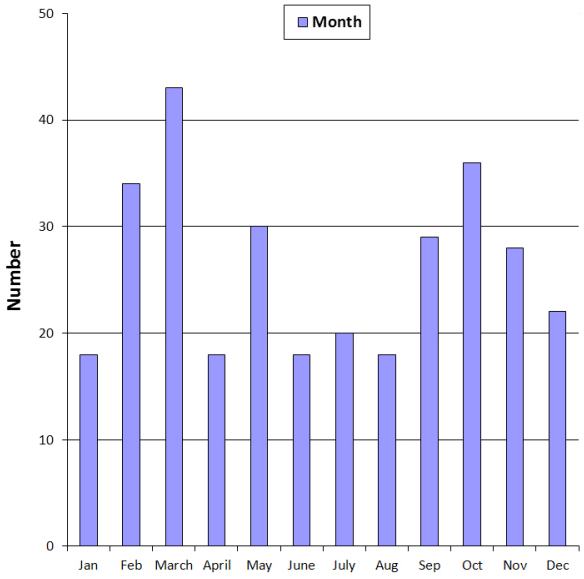

Figure 1. Sport-related oral and maxillofacial injury – month of presentation

3.3 Clinical presentation

The spectrum of facial trauma presenting is depicted in Figure 2. Of 317 patients referred to the Regional Maxillofacial Unit (RMU), 244 (77%) were reviewed, treated and discharged by a member of the department.

Seventy-three (23%) patients required hospital admission and surgery, sixty (18.9%) of which underwent reduction and fixation of facial fractures (zygoma [n = 29], mandible [n = 26] and orbit [n = 5]). Thirteen (4.1%) were admitted for inpatient management of soft tissue facial injuries only, two of which required wound debridement and skin grafting.

Of the 317 patients with sport-related facial trauma twenty-four (7.6%) suffered reported loss of consciousness (LOC) at the scene of accident. One patient did not regain consciousness immediately following injury and required intubation, ventilation and three days of intensive care following concomitant intracerebral injury playing rugby.

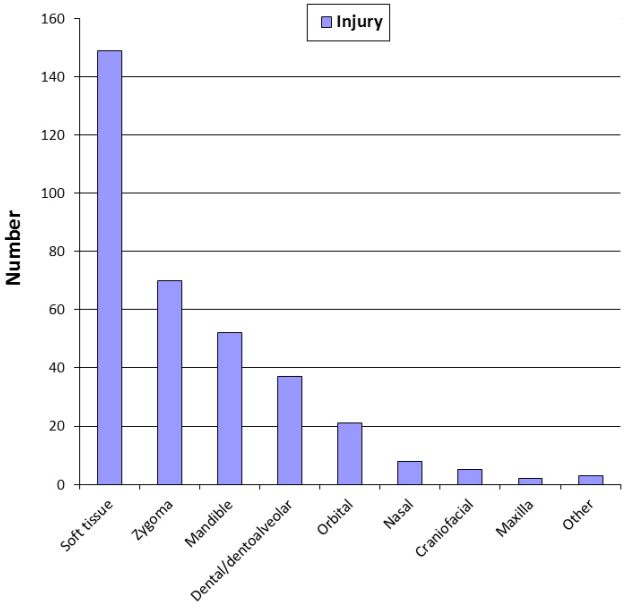

Figure 2. Sport-related oral and maxillofacial injury – type of injury

3.4 Concomitant injury

Thirteen (4.1%) patients referred with facial trauma suffered concomitant injury requiring surgical input from other specialties including neurosurgery (n = 3; 0.9%) (cervical spine injury) and orthopaedic surgery (n = 10; 3.2%) (upper and lower limb fractures).

3.5 Type of sport

Soccer (n = 93; 29.3%) and rugby (n = 57; 18%) were the most commonly encountered sporting aetiologies identified and the presenting injuries associated with these two sports is depicted in Table 2. Patients sustaining hard tissue trauma as a consequence of these were most commonly referred to the department for specialist input.

4. Discussion

In recent years, the adverse health effects of a sedentary lifestyle and promotion of exercise and physical activity to improve wellbeing has been advocated at national, international and global levels. Regardless of the undisputed health and social benefits of sporting participation, an increase in sports-related injuries, including orofacial injury, is recognised.[1–6]

4.1 Study comparisons

The prevalence of sport-related oral and maxillofacial trauma in this study (5.9%) is comparable to recent European studies (4%[4] and 6%[2]) where soccer participation and related injuries similarly predominate. Soccer has strong historical, cultural and social links to the population served by the RMU and its popularity accounts for the predominance of soccer-related facial injuries (n = 93; 29.3%). This is in contrast to previous similar UK-based studies which identified rugby as the leading cause of sport associated facial injury.[7,8] Zygomatic followed by mandibular fractures were the most common facial fractures associated with soccer and in keeping with other studies all were associated with collision with an opponent.[2,4]

Table 2. Types of injuries sustained playing soccer (football) and rugby

	Soft tissue	Nasal	Dental/Dentoalveolar	Zygoma	Orbital floor	Mandible	Maxilla	Craniofacial
Soccer (n = 93; 29.3%)	38	3	4	30	9	24	1	1
Rugby (n = 57; 18%)	21	1	3	18	6	14	0	1

The cultural influences and inherent risks of different sporting activities may account for varying prevalence in sport-related injuries. In New Zealand, where rugby is the national sport with high levels of participation, sporting aetiology in one study accounted for 21.7% of all facial fractures presentations.[5] Rugby, once considered the most dangerous team sport,[9] is a high impact contact sport with minimal body protection and is recognised as leading cause of injuries, including facial fractures.[7] Despite the popularity of soccer in the area reviewed, injury as a cause of rugby still

accounted for 57 (18%) referrals; the majority (n = 43) had sustained hard tissue trauma requiring reduction and surgical fixation. As mentioned, rugby as the leading cause of sport-related facial fractures in other areas of the UK is well recognised.[7,9]

As observed in similar studies,[2–6] male patients most commonly presented with sport-related facial injuries which may reflect the prevalence of male involvement in contact sports. The increased muscle mass and speed of male participants and therefore the greater force exerted on opponents with resulting injuries may also be accountable.[3,10]

Younger patients (11-20 years) (n = 108; 34.1%) most frequently presented with orofacial trauma secondary to sporting accident. In other reviewed studies, patients under thirty years of age were similarly most affected and it has been suggested this represents the high proportion of teenagers and young adults involved in organised sporting activity[4] many of whom are traditionally regarded as less risk averse and therefore susceptible to injury than older peers.

The seasonal variation in sport-related facial injuries is recognised. As identified in comparable previous literature, popular contact sports, typically soccer and rugby, are practised from late autumn until early spring and the majority of sport-related facial injuries are observed during the winter months.[5] This trend is echoed by the findings of this study in which the beginning and end of the soccer and rugby seasons coincided with the highest numbers of sport-associated injuries. It has been suggested lower fitness levels and conditioning, classically at the beginning of the sporting season, may be responsible for increased numbers of sporting injuries at this time.[11] Additionally busy fixture lists, arranged to avoid the worse of the winter weather, will ultimately impact on trauma presentation.

As alluded to previously, facial fractures as a consequence of sporting trauma were encountered frequently. In keeping with other retrospective reviews where soccer and soccer-related injuries predominate,[2,4] the most common facial fractures affected the zygoma and mandible, with far fewer injuries affecting the orbits or midface. This finding was common to our own.

4.2 Minor facial injuries

The relatively few soft tissue facial injuries encountered almost certainly represents the appropriate management of these common injuries in A&E departments and minor injury units, many of which do not require specialist input. In addition, some soft tissue facial injuries and nasal fractures may be referred to the allied specialties of Plastic Surgery and Otorhinolaryngology (ENT) respectively.

4.3 Amateur participation and protective equipment

All patients presenting with sport-related facial trauma sustained injury participating at amateur level. The increase prevalence in amateur sporting injuries is recognised and may represent reduced levels of fitness, physical conditioning or skill. Additionally, inadequate enforcement of recommended or mandatory protective equipment at amateur level may predispose participants to injury and it is the duty of amateur sporting associations to ensure minimum levels of protection for all players. Only limited data was available on the use of orofacial protective equipment among patients at the time of injury and this must form a key component of future studies.

4.4 Limitations of study

There are key limitations of this study. The retrospective methodology of data collection predisposes to inherent observer bias. Furthermore the collected data is only representative of a single, UK-based, urban trauma population over a two year period. These two important features must be considered when interpreting the findings of this study.

Information on the use of protective equipment was poorly documented in the clinical cases reviewed.

Finally, missing and incomplete data, which is often typical of database compilation and review, should be recognised.

5. Conclusions

Despite many health and social benefits of playing sport, increasing participation in recent years has seen an increase in sport-associated facial injuries occurring largely at amateur level. Of additional concern is the small proportion of patients who incur serious concomitant injury while engaging in perceived healthy leisure activities.

Robust literature on serious sport associated facial injury requiring specialist surgical input is limited but encountered in sufficient numbers to warrant further investigation. Young males participating in amateur rugby and soccer in the UK are most at risk. The use and efficacy of current protective orofacial equipment should be the objective of future prospective research.

Conflicts of Interest Disclosure

The authors declare they have no competing interests.

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