IJIRR

International Journal of Information Research and Review
Vol. 03, Issue, 09, pp. 2806-2810, September, 2016

Research Article

CLINICAL ANDEPIDEMIOLOGICAL PROFILE OFINJURIES IN MAXILLOFACIAL COMPLEX: STUDY OF A BRAZILIAN POPULATION

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ARTICLE INFO

Article History:

Received 29th June 2016
Received in revised form
24th July 2016
Accepted 20th August 2016
Published online 30th September 2016

Keywords:

Facial Injuries,
Wounds,
Mouth,
Maxillofacial Surgery.

ABSTRACT

Introduction: facial injuries are presented in different ways and variable complexity. The treatment of these lesions are established according to their length, depth, degree of contamination, etiologic agents and exposure time.
Objective: this study aimed to evaluate the clinical epidemiological profile of soft tissue injuries in patients with maxillofacial traumas of a Brazilian population.
Methods: the retrospective cross-sectional study was performed with a sample of 213 patients attended in an emergency medical service. All clinical and socio-demographic data were collected from medical records. Statistical analysis was performed using descriptive statistics.
Results: from the total sample 81,2% (n=173) were male. The data shows that motorcycle accidents (46.9%; n=100), interpersonal violence (20.7%; n=44) and falls (10.3%; n=22) constitute the main etiological agents related to injuries of the face. The chop wounds (42.7%; n=91), abrasions (16.9%; n=36) and split lacerations (11.3%; n=24) were the most prevalent lesions of maxillofacial complex. The frontal (20.7%; n=44), buccal (16%; n=34) and orbital regions (15.5%; n=33) were the most affected anatomical sites by trauma.
Conclusion: the maxillofacial trauma is more predominant in males. Motorcycle accidents are the most prevalent causes of soft tissue injuries of the facial complex. The frontal, buccal and orbital regions are the most commonly sites affected by injuries.

INTRODUCTION

Soft tissue injuries of the oral maxillofacial complex have great relevance to the treatment of traumatised patients(Peterson 2004; Vieira *et al.,* 2013). The literature describes several etiological factors related to these injuries such as motor vehicles accidents, falls, sport related traumas and interpersonal violence (Arabion *et al.,* 2014; Bolt and Watts 2004; Kidd *et al.,* 2010; Chang and Tsai 2007). As a consequence, soft tissue injuries of the facecan generate since small excoriations and haematomas to severe blunt and sharp force injuries on the skin, muscles, bone and nerves (Carvalho *et al.,* 2010; Taher 1998; Motamedi 2003). The treatment of these lesions aims to restore the function of the affected region as well as to minimize the physical sequelae of patients as much as possible(Subcommittee *et al.,* 2013). Soft tissue traumas of the oral maxillofacial region is a common clinical situation in the daily life of emergency care units and hospitals, mainly in big urban centres and in regions with increasing demand for mobility, associated with traffic infractions and raising levels of criminality (Sastry *et al.,* 1995). According to the World Health Organisation (WHO), facial trauma is amongst the main causes of morbidity and mortality, affecting population with a great epidemiological variability, without distinguishing age, gender, income or geographic locality (World Health Organization 2011). Face injuries represent significant wounds on world health, and this presents high incidence and diversity in form and gravity (Krug *et al.,* 2000). Soft tissue traumas of the oral maxillofacial region present themselves in several forms and variable complexities, being approached according to their extension, depth, contamination degree, etiological agent and exposure time (Shaikh and Worrall 2002). Injuries are damages resultant from aggression on soft tissues, occasioned by traumatic agents that generate harm to them. In general, injuries cause pain, haemorrhage in various intensities and infection risks. Such injuries can be classified according to etiological factors, contamination degree, type of cicatrisation, complexity, opening degree, evolution time, tissue impairment

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and lesion mechanism (Clark *et al.,* 1996). Soft tissue injuries can be classified as: (1) abrasion or excoriation which is a superficial lesion on the skin characterized by the loss of epithelium and exposure of connective tissue (Taher 1998); (2) incised wounds, which are those that result from the sliding of sharp surface objects (knives, razors and blades) onto tissues(Knight and Saukko 2004); (3) puncture wounds, which are caused by pointed objects with uniform diameter, such as nails, needles and ice picks(Knight and Saukko 2004); (4) avulsions, which are produced when the causative agent of the trauma promotes tearing with partial or total loss of tissue continuity of the anatomic region (Knight and Saukko 2004); (5) contusions, which present irregular, sinuous and stellate margins, for being produced by round objects, through compressive, traction, percussive and drag forces (Knight and Saukko 2004); (6) Stab wounds, which are conditions caused by mixed action mechanisms, with linear and slit-shaped aspects, such as knives and daggers (Dantas *et al.,* 2013; Knight and Saukko 2004); (7) perforation and contusion wounds, which are those with mechanisms of action of a contusion and a perforation at the same time(Brozoski *et al.,* 2010); (8) chop wounds, which have a mechanism of action of an incision and a contusion at the same time, such as sickles, machetes and axes(Arabion *et al.,* 2014; Knight and Saukko 2004); and at last (9) split lacerations, which are caused most frequently by mechanisms of action of compression, that is, skin crushing (Bolt and Watts 2004; Lee *et al.,* 2015). The current study aimed to evaluate the epidemiological profile and the characteristics of soft tissue injuries in patients suffering from oral maxillofacial traumas of a Brazilian population.

MATERIALS AND METHODS

The current study, descriptive cross-sectional type, had a convenience sample of 213 patients suffering from oral maxillofacial, attended at the urgency and emergency departmentof the Hospital Municipal Maria Veneri (HMMV), located at the municipality of Trindade, state of Pernambuco, Brazil. For theperformance of the current study, there was an approval of the research ethicscommittee (protocol nº 1.429.294). Clinical and epidemiological data such as gender, age, trauma causes (traffic accidents, physical aggression, amongst others), injury types (contusions, lacerations, perforations etc.), affected areas of the maxillofacial complex, associated dental trauma, imaging tests solicitations (tomography, radiography), types of performed treatments (sutures, bandages) and prognosis of patients (discharge, hospitalisation, transfer and death) were obtained through patients' registries of medical records.

As for the identification of trauma sites, it was used an anatomical division according tofigure 01.In cases which the victims presented more than one type of injury (contusions, lacerations, perforations), it was considered the most extensive lesion. Medical records of patients with history of oral maxillofacial trauma between the period of June 2014 and June 2015 were included. Incomplete or illegible medical records were excluded from the study.The work team consisted of previously trained students from a Dentistry graduation course. The obtained data were digitalised and tabled on the software SPSS version 17.0 (*Statistical Package for Social Science*) and posteriorly treated with statistical descriptive tests.

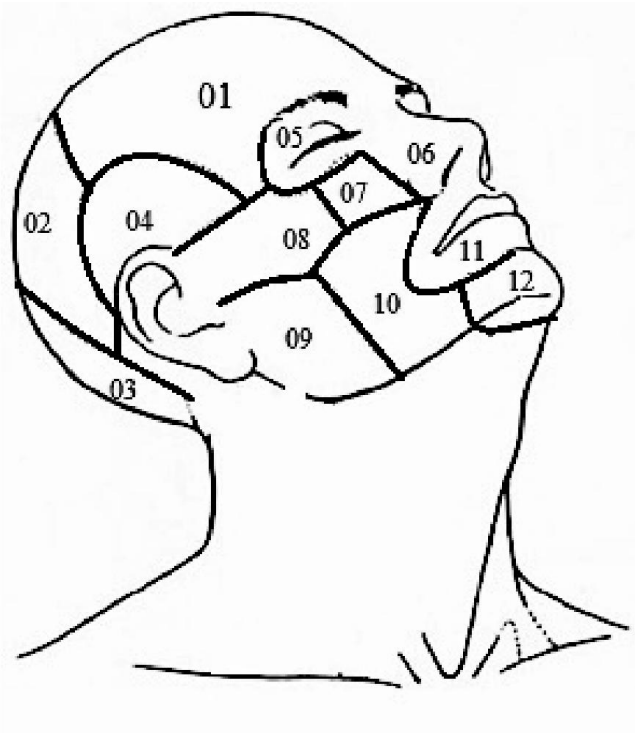

Figure 01. Anatomical divisions of the face. (1) frontal region; (2) parietal region; (3) occipital region; (4) temporal region; (5) orbital region; (6) nasal region; (7) infraorbital region; (8) zygomatic region; (9) parotideomasseteric region; (10) buccal region; (11) oral region; (12) mental region.

RESULTS

From the 213 selected cases, 173 (81.2%) weremale and 40 (18.8%) femalewith average age of 29.8 years (median 27 years), varyingfrom 02 to 76 years old. Regarding the etiological factors of oral maxillofacial traumas, motorcycle accidents were the most prevalent causes of wounds in soft tissues of the face, totalising 46.9% (n=100)of the sample, followed by physical aggression (20.7%, n=44) and falls (10.3%, n=22). In addition, cases of cycling accidents, run-over accidents, automobile accidents and blunt force injuries were also identified (Table 01).

Table 1. Sample distribution as for etiological agents of oral maxillofacial traumas

TRAUMA CAUSE	N	PERCENTAGE
Motorcycleaccidents	100	46.9%
Physicalaggression	44	20.7%
Falls	22	10.3%
Cyclingaccidents	12	5.6%
Run-over accidents	09	4.2%
Automobileacidentes	08	3.8%
Blunt force injuries	04	1.9%
Others*	14	6.6%

*Cycling accidents, animal accidents, civil construction accidents

From the patients that presented lesions in the face, taking the topography of the soft tissue injuries as a reference, the most commonly affected areas were the frontal region(20.7%, n=44)followed by the buccal region(16.0%, n=34)and orbital region (15.5%, n=33).

Table 2. Sample distribution as for the affected sites of oral maxillofacial traumas

ANATOMICAL SITE	N	PERCENTAGE
Frontal	44	20.7%
Buccal	34	16.0%
Orbital	33	15.5%
Occipital	23	10.8%
Parietal	19	8.9%
Oral	16	7.5%
Zygomatic	16	7.5%
Mental	14	6.6%
Temporal	08	3.8%
Nasal	06	2.8%

Table 3. Sample distribution as for the type of injury caused by oral maxillofacial traumas

TYPE OF WOUND	N	PERCENTAGE
Chop	91	42.7%
Excoriation/abrasion	36	16.9%
Incised	24	11.3%
Split lacerations	24	11.3%
Hematoma	21	9.9%
Stab	10	4.7%
Perforationandcontusion	7	3.3%

It was yet verified the presence of lesions in the occipital, parietal, oral, zygomatic, temporal and nasal regions (Table 02). The analysis of the types of lesions caused by trauma actions highlighted that the most prevalent injuries were chop wounds, identified in 91 patients (42.7%). The excoriations were the second most observed type in the studied sample, representing16.9% (n=36) followed by incised wounds and split lacerations wounds (11.3%, n=24) (Table 03). The treatment choice for the majority of the cases was the performance of sutures and bandages (77.5%, n=165). For85.4% of the patients (n=182) the trauma evolution progressed to hospital discharge. Transfer of victims to high complexity hospitals occurred in14.6% of the sample (n=31).Regarding dental involvement, only 2.8% of the studied cases presented any trauma in dental elements.

DISCUSSION

Regarding the assistance to polytraumatised patients, the oral maxillofacial lesions assume relevant circumstances to victims' treatments, once the severity of injuries can put human lives in risk(Carvalho Filho *et al.,* 2015; Carvalho *et al.,* 2010). The literature highlights which initial clinical approach must be focused on during a thorough clinical exam in order to discard the presence of lesions that offer death risks(Peterson 2004).In manysituations, imaging tests such as radiography, tomography and ultrasonography are necessary to a better evaluation of the clinical condition of patients(Carvalho Filho *et al.,* 2015; Dantas *et al.,* 2013; Shaikh and Worrall 2002; Vieira *et al.,* 2013). Our results highlighted that the oral maxillofacial lesions were more prevalent for the male gender and that the most common cause of traumas were motorcycle accidents. In Brazil, men make up the majority of population that drive vehicles in the traffic, specially motorcycles (Batista Fdos *et al.,* 2015; de Carvalho *et al.,* 2016).In this sense, male individuals would have more risks of involvement in traffic accidents.

Furthermore, the lack of protective equipment usage such as helmets and seatbelts, as well as alcoholic beverages intake, can contribute to the high prevalence of traumas involving soft tissues from the oral maxillofacial complex in this group of people (Arabion *et al.,* 2014; Bolt and Watts 2004; Carvalho *et al.,* 2010). The anatomical location and the type of trauma are great predictors of lesion severities (Bolt and Watts 2004; Singh *et al.,* 2012). On the current work, we observed that the most commonly affected anatomical sites were the frontal, orbital and buccal regions. The literature describes that the location and prevalence of injuries in the oral maxillofacial region can be related to skeletal projections of the cranium and face (Vieira *et al.,* 2013). Such fact suggests that the trauma that comes from accidents involving automobile vehicles can generate biomechanical forces linked to middle and upper thirds of the face.As for the type of injury caused by the trauma, it was observed that chop wounds were the most prevalent. Many authors affirm that the type of injury generated by the trauma depends on the type and strength of the causative agent (Bolt and Watts 2004; Carvalho *et al.,* 2010; Chang and Tsai 2007; Clark *et al.,* 1996; Knight and Saukko 2004; Lee *et al.,* 2015; Taher 1998). Soft tissue injuries occur primarily by the compression of the tissues between the bones and the contusion objects and depending on the incidence of strength and the shape of the objects, the most diverse forms of injuries occur (Vieira *et al.,* 2013).

Several authors highlight that the management of oral-facial injuries must be guided from the principles of haemorrhage contention (compression, vessel ligations) besides infection prevention (Carvalho Filho *et al.,* 2015; Carvalho *et al.,* 2010; Peterson 2004; Valderrama 2006). The cleansing of wounds is fundamentally important to minimize infection risks. Several authors affirm that the wounds must be washed with a 0.9% saline solution in order to removeclots, foreign bodies and exogenous materials (Singer *et al.,* 2005; Valderrama 2006). Many works point out that the longer the time of wound exposure, the greater the infection potential will be(Carvalho *et al.,* 2010; Valderrama 2006). Besides that, lesions associated with compressions and/or ischemia can present elevated risks of infection(Bolt and Watts 2004). The presence of necrotic tissue also increases the risk of infection and masks the extension and depth of wounds (Dantas *et al.,* 2013).

In present study, the conduct of choice to the majority of patients was the performance of sutures followed by hospital discharge. These findingssuggest that an immediate approach with performance of bandages and sutures and manoeuvres of infection control, in general, are a resolution for cases of injuries in oral-facial soft tissues. The literature highlights that during sutures, threads that promote good approximation of the wound margins, low potential of scar formation, besides a minimum tissue irritation, must be used (Peterson 2004; Singer *et al.,* 2005; Singh *et al.,* 2012; Taher 1998). Curiously, only 2.8% of the studied sample presented any associated dental trauma. Some studies point out thatdentoalveolar traumas can have and incidence that varies from 4 to 30% in the general population (Carvalho Filho *et al.,* 2015; Peterson 2004). The low prevalence of dentoalveolar traumas can be linked to a deficiency in the processes of diagnosis of dental traumas. In general, the hospital emergency team do not have dentists,

being mainly composed by doctors and nurses. The absence of dentists in the primary care of traumatised patients can be one of the factors linked to low prevalence of dentoalveolar traumatisms. Due to the high prevalence and incidence of facial traumatisms, there is a need for having a broad comprehension of patterns of injuries and lesions that affect the face, so that the emergency assistance is effective and offers adequate conducts of treatments (Bolt and Watts 2004). In view of the relevance of the topic, more clinical epidemiologic studies are necessary for a better comprehension of the etiological factors, types and consequences of soft tissue injuries in patients suffering from oral maxillofacial traumas.

Conclusion

It can be concluded from this study that:

- Facial traumas are more common in male individuals.
- Motorcycle accidents are the most prevalent causes of soft tissue injuries in the oral maxillofacial complex.
- The most affected anatomical sites by traumas in the face are the frontal, buccal and orbital regions.
- Chop type injuries are the most prevalent ones linked to facial complex traumas.

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