Original Research Article

Emergence of maxillofacial surgery service: profile changes 1998 and 2012

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ABSTRACT

Background: *The face is more prone to trauma, being the most exposed part of the body. Over the last three decades, there has been a growing increase of trauma.*

Objectives: *This research aims to identify the kinds of assistance and the profiles of the assisted between 1998 and 2012 at the maxillofacial surgery service at Odilon Behrens Hospital.*

Methods: *A retrospective and descriptive study was conducted at Odilon Behrens Municipal Hospital in Belo Horizonte, Minas Gerais, based on reports at appointments completed by the maxillofacial surgery team, using survey data from a total of 2,920 patients registered for control. The assessment took into account treatments performed in 1998 compared to 2012. The data analysed essentially included diagnosis and hands-on management in our service.*

Results: *After evaluation, the results obtained showed an increase in cases from 1998 to 2012 due to aetiologies such as: fall from height, orofacial pain, motorcycle accidents, odontogenic infections, accident with objects, oedema, epistaxis and household accidents; in contrast, a significant reduction in cases between 1998 and 2012 was observed in the following aetiologies: cycling accident, automobile accident, facial trauma, pedestrian injury from vehicles, accident involving animals*

Conclusion: *Our research indicates that the ratio of 2:1 male/female patients in 1998, decreased to 55:1 in 2012. Although there were slight variation sin aetiology and diagnoses, in general our results remain the same when comparing 1998 to 2012.*

Keywords: *maxillofacial fractures, epidemiology, traumatology*

Introduction

Due to the increase in deaths, injuries and disability attributable to external causes in Latin America, especially in large urban centres, hospital dental care is increasingly more concerned with cases of violence. However, maxillofacial service is also involved in emergency room cases providing indices of epidemiological studies comprising from odontogenic infection, falls in general, urban violence and violence in traffic, current studies show the importance of a professional in decision making regarding wider care in hospitals and ambulatory services. [1] Victims of facial injuries can sustain scars or disfigurements, with their resultant emotional and psychological impact. [2] Psychological impairment such as post-traumatic stress syndrome and depression are common after

sustaining facial injuries. [3] Maxillofacial injury is also associated with high socio-economic import due to the increasing cost of hospital resources as well as time lost in work. [4] The area of operation of the maxillofacial surgeon involves the soft and hard tissues forming the face, extending from the frontal bone superiorly to the mandible inferiorly. The face, being the most exposed part of the body, is particularly prone to trauma. Trauma to the facial region causes injuries to skeletal components and dentition as well as the soft tissues of the face. [5]

Maxillofacial fractures are more prevalent in large cities due to heavy traffic and a high rate of violence. The causes, types and fracture sites are different. Various studies have shown the relationship between maxillofacial fractures, sex, age and level of urban development. [1–5] Since humans evolved and developed more machines to facilitate day-to-day life, the incidence and severity of lesions on the face due to trauma has also increased,[6] owing to the greater number of drivers, an increase in physical contact sport and increased social activity, inferring greater consumption of alcohol and other drugs. [7] In turn, some affirm that, especially over the last three decades, there has been a growing increase in trauma in women of around 40 years old, due to their increasing participation in activities that were previously male dominated. [1,8]

The aim of this study was to compare the type of care given to patients identified in the database of the maxillofacial surgery service offered by Odilon Behrens Municipal Hospital in Belo Horizonte, Minas Gerais. The survey data was comparison of the years 1998 and 2012, with statistical data.

Material and Methods

A retrospective and descriptive study was conducted at Odilon Behrens Municipal Hospital in Belo Horizonte, Minas Gerais, based on reports of visits completed by the surgery and maxillofacial teams, with survey data from a total of 2,920 patients registered as controls. The assessment considered assistance performed in 1998 compared to 2012. The data analysed included: age and gender of the patient, the aetiology of care, diagnostic service, the occurrence of facial fracture, the affected region and action or conduct performed. To analyse the data, medical records were divided according to the patients' age group up to 7 years, between 7 and 14, between 14 and 21 years, between 21 and 34 years and more than 34 years. Patients were divided by male and female gender.

Regarding precedence, the referential point was the city of Belo Horizonte, and the classification 'other locations' was assigned to patients from other cities due to the regional influence of Belo Horizonte, especially concerning health centres. Hospital Municipal Odilon Behrens (HMOB) is a public referral hospital that attends to about 11,000 patients monthly. The hospital provides emergency dental care and maxillofacial surgery with monthly averages of 1,300 and 500 patients, respectively. The aetiological agents were divided into falls, physical assault, cycling accident, automobile accident, trampling, sports accidents, motorcycle accidents, accidents with animals, cut accidents by blunt object, odontogenic infection and angina de

Ludwig, orofacial pain, gunshot, work accident, seizure, trauma to the face, oedema, domestic accident, epistaxis, bleeding, myiasis and facial paralysis.

The diagnoses were divided into 17groups: dental trauma, superficial injury of face, intraoral contusions odontogenic infection, fracture of the nose bones, mandible fracture, temporomandibular dysfunction, zygomatic complex fractures, bleeding, referred to stomatology, condylar fracture, dislocation of condyle, orbital floor fracture, extraoral contusions superficial oral injury, alveolodental fracture and jaw fracture. Also, regarding conduct, the diagnoses were subdivided into prescribing, suturing and splinting; and follow up, maxillomandibular fixation, request for pre-operative examinations, hospitalization, drainage, surgery, return for review and several interventions such as debridement, reduction and repositioning, and nasal packing. Values in percentage referring to the numbers observed in the data collection were considered in the evaluation.

Results

Based on these reports, a profile of the patients seen in these two years was drawn up. The Aetiologies between the years 1998 and 2012 were showed in table 1. When we compared the profile of care between these periods, it was noted that a ratio of 2 males to 1 female patient in 1998, decreased to 1.55:1 in 2012. However, the female ratio remained even lower compared to males in 2012 which increased from increased from 33.3% in 1998 to 39.1% in 2012. The distribution of patients in these two years in relation to gender can be seen in Fig. 1.

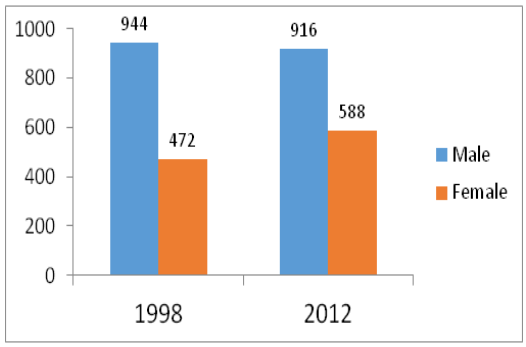

Fig.1 Gender distribution by year

In regard to age, sample data from individuals in 1998 and 2012 were observed, and is important to note that the age range of individuals up to 7 years decreased from 30.8% in 1998 to 22.2% in 2012, and the age range of individuals over 34 years increased from 17.9% in 1998 to 30.2% in 2012 (Fig. 2). The average age of the subjects increased from 20 years in 1998 to 26.5 years in 2012, as well as the median that in 1998 was 18 years old and in 2012 increased to 23 years (SD 16.0 and 19.7, respectively).

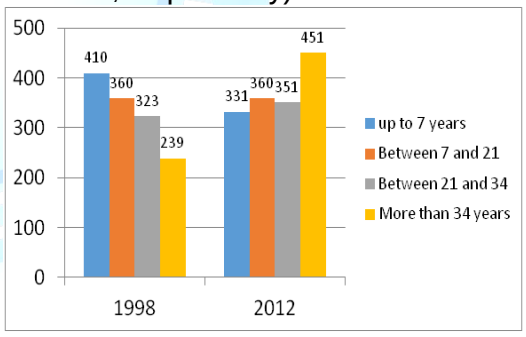

Fig. 2 Age distribution of patients in each year

After evaluation, the results obtained varied in relation to an increase only in cases between 1998 and 2012 comparing aetiologies (Table 1) such as: fall from height, orofacial pain, motorcycle accidents, odontogenic infections, accident with objects, oedema, epistaxis and household accidents. In contrast, a significant reduction in cases between 1998 and 2012 in the following aetiologies was observed: cycling accidents, car

accidents, injuries to the face and trampling accidents involving animals.

Table 1: Aetiologies between the years 1998 and 2012

Aetiology	Year				Total
	1998		2012		
	N	%	N	%	
Fall of ownheight	358	12.93	451	16.28	809*
Physical aggression	244	8.81	210	7.58	454*
Fall from height	162	5.85	149	5.38	311*
Cycling accident	133	4.98	62	2.24	195*
Vehicle accident	81	2.92	58	2.09	139*
Trauma toface	112	4.04	19	0.69	131*
Sports accident	56	2.02	59	2.13	115*
pedestrian injury from vehicles	60	2.17	21	0.76	81*
Face and mouthpain	20	0.72	80	2.89	100*
Motorcycle accident	21	0.76	52	1.88	73*
Odontogenic infection	42	1.52	75	2.71	117*
Injury by cut blunt object	22	0.79	52	1.88	74*
Edema	17	0.61	31	1.12	48*
Projectile gun injury	11	0.40	11	0.40	22*
Work accident	9	0.32	12	0.43	21*
Animal accident	14	0.51	5	0.18	19*
Domestic accident	7	0.25	13	0.47	20*
Epistaxis	4	0.14	8	0.29	12*
Convulsive crisis	2	0.07	5	0,18	7
Bleeding	9	0.32	5	0.18	14*
Myiasis	2	0.07	5	0.18	7
Facial paralysis	0		1	0.04	1
TOTAL	1386	50.04	1384	49.96	2770

***p* ≤ 0.05**

Table 2: Diagnoses from the years 1998 and 2012

Diagnosis	Year				Total
	1998		2012		
Dental trauma	515	55.7	410	44.3	925*
Soft tissue trauma	207	35.8	371	64.2	578*
Intraoral contusion	282	63.5	162	36.5	444*
Nose fracture	75	40.8	109	59.2	184*
Fractured jaw	98	54.7	81	45.3	179
Odontogenic infection	74	37.6	123	62.4	197*
Fracture of zygomatic complex	53	43.1	70	56.9	123
Temporomandibular joint dysfunction	29	28.2	74	71.8	103*
Bleeding	23	25.3	68	74.7	91*
Tooth alveoli fracture	53	89.8	6	10.2	59*
Condyle fracture	27	60.0	18	40.0	45*
Dislocation of condyle	27	65.9	14	34.1	41
Referred to stomatology	4	12.5	28	87.5	32*
Maxillar fracture	17	73.9	6	26.1	23*
Orbital floor fracture	5	31.3	11	68.8	16
Extraoral contusion	0	0.0	10	100.0	10*
Deep oral trauma	0	0.0	7	100.0	7*

***p* ≤ 0.05 Chi-square test was used to assess the statistical data collected at varying levels

Table 3: Values occurrences by year

Occurrences	Year				Total
	1998		2012		
Prescription	555	33.1	666	35.2	1221
Suture	290	17.3	204	10.7	494*
Splinting	170	10.1	210	11.1	380
Follow-up	172	10.2	305	16.3	477*
Maxillomandibular fixation	113	6.74	51	5.92	164*
Request for exams andpre-operative exams	98	5.84	112	5.92	210
Extraction	85	5.07	9	0.47	94*
Hospitalization	48	2.86	109	5.76	157*
Drainage	51	3.04	16	0.84	67*
Surgery	42	2.50	64	3.38	106
Return for review	13	0.77	90	4.76	103*
Various Interventions debridement, reduction, repositioning	29	1.73	44	2.32	73
Nasal packing	10	0.59	10	0.52	20

***p* ≤ 0.05**

In this study, a significantly higher incidence in males for diagnoses (Table 2) of fracture of mandible zygomatic complex fracture, tooth socket fracture and fracture of the condyle was observed. However more occurrences were observed in females for diagnosis of mandibular dysfunction and dislocation of temporo mandibular condyle. Among the cases with the highest number of occurrences (Table:3) in 1998 are prescription (33.1%), suture (17.3%),

splinting (10.1%) and follow up (10.2%), corresponding to 70.7% of year data. But for the year 2012, cases with the largest number of occurrences t were again prescription (35.2%), followed by follow up and guidelines (16.3%), splinting (11.1%) and suture (10.7%), corresponding to 73.3% of the year data. It is important that prescribing and splinting observation showed a slight increase from 1998 to 2012, since the action of preservation- associated guidelines has increased considerably from 1998 to 2012.

Discussion

With the analysis of the record books evaluated under the care of the Odilon Behrens Municipal Hospital maxillofacial surgery service, comparing the results obtained between the years 1998 and 2012, we observed that the majority of patients treated were males, with ratios of 2:1 in 1998 and 1:1.55 in 2012, and twice the number of attendances, following a statistical pattern mentioned by other authors. [9,10] The greater number of males requiring care can be explained by the fact that men are more involved in outdoor activities and are also more exposed to violent interactions compared with women, who are less exposed due to social and religious limitations male drivers also far outnumber female drivers. [11,12]

The indices of this survey compared with Parker et al [13] shows that the reasons for the higher frequency of service in the field of maxillofacial surgery in developing countries, is the lack of road safety, inadequate road conditions, lack of expanding motorway network, disrespect of the speed limit, older vehicles without safety features or without a seat belt, highway code violations and use of alcohol or other intoxicating agents. Related to this is the number of motorcycle accidents, car accidents and pedestrian accidents. [14] Looking at physical aggression, similarities were observed in our results when compared to other work. [7] The most important reason is the involvement of young people in conflicts, these young people from all social classes, also mentioned by another author, highlights the devaluation of life and the trivialization of antisocial behaviour. [15] One aspect of physical aggression found in rates of attendance is related to domestic assault, where there are few options available to those who are subjected to a state of penury in trying to deal with economic problems, and find it hard to cope with difficult emotional situations, leading to an escalation of violent actions. Some studies suggest the importance of factors such as unemployment in heads of families and marriage instability as causes of non-lethal domestic violence. [3,13]

Distinct approaches have a number of elements of continuity, since there is a structural reality of poverty, relative or absolute, favouring the possibility of a flourishing subculture of violence. Our results showing a strong connection with the situation in Brazil, where we found the two highest levels finding the two highest levels of care in maxillofacial surgery to be from simple falls and physical aggression due to the high rate of violence and crime.[16]The elements of this subculture have been found to generate violence indirectly through poverty. [13] In any case, a strong conviction in two other studies has to be considered: that there is a close, though not causal interaction between violent crime and socioeconomic conditions. [17,18] The rates observed in the survey regarding the decrease in the number of cycling accidents between 1998 and 2012, may be related to the

changesinthe wearing of helmets and protective gear for cyclists, this habit becoming more common every day. For cyclists, equipment such as abell, amirror on the left side and night-time signals on the front, rear, side and pedalsis important. However, current legislation does not describe an obligation to use accessories such asthe rider's helmet, which is not mandatory but recommended use. [19,20] In Brazil, cyclists are becoming more conscious ofusing an accessory that allows the head to be protected during use of the bicycle as transport or recreation. Along with this, it should be understood that this is the correct way to equip oneself for cycling, the same cycling helmet not being so effective in maxillomandibular protection, these cyclists achieve a higher level of protection than the common unaware user. [21,22]

Since a study by the Ministry of Health had shown a reduction of up to 10% in the number of hospitalizations for firearm injuries after deployment of the National Campaign on Disarmament, [23] we expected to find a reduction in the number of visits for firearm injury, in the surgery and maxillofacial department. However, it was noted that there was no such trend, since the average attendance has remained the same. According to data released by the Ministry of Health, in some states firearm injuries decreased and in other states, even after the disarmament campaign, injuries increased, disproving the total efficiency of this law. [24]

In Connection to the work of Motamed et al. [25] a survey was conducted within military training centres in three different provinces and data was gathered from two months of intense combat training for guerrillas. Data and the accompanying report found the same rates raised by our research today in our population. The highest prevalence rates were: dental trauma, contusion lesion the face and nasal bone fracture in 60% of visits.

In 2008, Kotecha [26] attendances of 1,062 patients in a hospital specialized in paediatric emergency attendances in England showing results in the proportion ratio of 2 boys to 1 girl, the same result as found in our survey for 1998. The finding wasthat the main causes of attendance were 70% forfall and 17% for any type of personal violence. From the total, 70% of visits were for injuries to soft tissue, and 14% had some type of facial fracture. However, these data vary fromour results perhaps being accounted for by cultural differences.

Allareddy et al. (2011)[27] showed clearly in their research during the year 2007 on maxillofacial services performed in the United States of America, an average age of 37.9 years was calculated, which was higher than our results. They found that 68% of cases were males, which was similar to the percentage found in our service. Allareddy et al. [27] have performed financial calculations in relation to appointments with a mean value of $3.192 per patient, and the average hospital charges for 2007 for facial trauma around $1 billion. Physical abuse accounted for 37% of attendances falls were 24% and motor vehicle accidents, 12.1%, highlighting the public health impact caused by facial fractures.

Lee [28] conducted a study in New Zealand, performing a comparison between the treatment of maxillofacial fractures and its links to alcohol consumption. It was found that facial fractures are a major problem among young adult males who use alcohol in excess. Consumption of alcohol and other drugs is recognized as an independent risk

factor for violent behaviour. It is most prevalent in young males, with the main causes being physical injury, automobile accidents and high rate of robberies in late evening hours. [29] Due to the retrospective and descriptive nature of our study, it was not possible to relate the consumption of alcohol and drugs in the population. Probably the consumption of alcoholic beverages is highly prevalent in our visitors. However, a new study is necessary in order to confirm this interrelationship.

Although there were slight variations aetiologies and diagnoses in general our results remains the same when comparing 1998 and 2012.This may be different between countries. We agree with Leles et al. [30] about a need for effective educational and communication strategies and the implementation of policies aimed at preventing and reducing maxillofacial injury and its effects.

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