

Prevalence of maxillofacial trauma in a reference hospital in the dominican republic

Prevalência de trauma maxilofacial em um hospital de referência na República Dominicana
Prevalencia de trauma maxilofacial en un hospital de referencia en la República Dominicana

ABSTRACT

Introduction: Maxillofacial trauma occurs frequently because the face is anatomically exposed, and its bones are fragile. Therefore, understanding the frequency and distribution of facial fracture cases in a population can help establish research priorities for the effective treatment and prevention of these injuries. **Objectives:** This study aimed to carry out a survey of data contained in the medical records of patients with maxillofacial trauma at the Hospital Docente Univer-sitário Dr. Dario Contreras between 2014 and 2019. **Methodology:** This is a Descriptive retrospective epidemiological study. In this way, we look for: Identify the type of fracture prevalent in this city, the main etiology and most affected gender and age group. The sample was composed of 6,525 medical records of patients affected by facial trauma were found. The data collected included: age, gender, etiology, anatomical site, and form of treatment. After collecting the data, they were organized and tabulated in an Excel spreadsheet for Windows. The incidence of etiologies was analyzed and correlated with the gender of affected patients. The incidence of fractures was also evaluated according to their anatomical location, and then correlated with the type of treatment. Descriptive Statistics was then performed, with the objective of showing a global view of the prevalence of the collected data, showing its distribution through graphs and tables. **Results:** The study consisted of 6229 individuals with maxillofacial trauma. Males had the highest incidence (73.69%) in the third decade of life. The main etiologies were traffic accidents (61.59%), followed by aggression (22.62%). Of the total fractures, 70.20% were in the middle third of the face, with the zygomatic bone and nasal bones being the most affected regions. In the mandible, the regions mainly affected were the body and the angle. As for treatment, open reduction and rigid internal fixation represented the form of treatment for most patients. **Conclusion:** It can be concluded that zygomatic bone fractures were the most prevalent facial fractures in the group of individuals studied, having mainly affected men in the third decade of life, victims of traffic accidents, treated mainly with open reduction and stable internal fixation. **Key-words:** Facial trauma; Prevalence Study; Etiology; Epidemiology; Maxillofacial Surgery.

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RESUMO

Introdução: Os traumas maxilofaciais ocorrem com frequência, pois a face é anatomicamente exposta e seus ossos são frágeis. Portanto, conhecer a frequência e a distribuição dos casos de fraturas faciais em uma população pode ajudar a estabelecer prioridades de pesquisa para o tratamento eficaz e a prevenção dessas lesões. **Objetivos:** Este estudo teve como objetivo realizar um levantamento de dados contidos nos prontuários de pacientes com trauma maxilofacial no Hospital Docente Universitário Dr. Darío Contreras entre 2014 e 2019. **Metodologia:** Trata-se de um estudo epidemiológico retrospectivo descritivo. Desta forma, buscamos: Identificar o tipo de fratura prevalente nesta cidade, a principal etiologia e o sexo e faixa etária mais acometidos. A amostra foi composta por 6.525 prontuários de pacientes acometidos por traumas faciais. Os dados coletados incluíram: idade, sexo, etiologia, sítio anatômico e forma de tratamento. Após a coleta dos dados, estes foram organizados e tabulados em planilha Excel para Windows. A incidência das etiologias foi analisada e correlacionada com o sexo dos pacientes acometidos. Também foi avaliada a incidência das fraturas de acordo com a sua localização anatômica, e posteriormente correlacionada com o tipo de tratamento. Em seguida, foi realizada a Estatística Descritiva, com o objetivo de mostrar uma visão global da prevalência dos dados coletados, demonstrando sua distribuição através de gráficos e tabelas. **Resultados:** O estudo foi composto por 6229 indivíduos com traumatismo maxilofacial. O sexo masculino apresentou a maior incidência (73,69%) na terceira década de vida. As principais etiologias foram os acidentes de trânsito (61,59%), seguidos das agressões (22,62%). Do total de fraturas, 70,20% ocorreram no terço médio da face, sendo o osso zigomático e os ossos nasais as regiões mais acometidas. Na mandíbula, as regiões mais afetadas foram o corpo e o ângulo. Quanto ao tratamento, a redução aberta e a fixação interna rígida representaram a forma de tratamento para a maioria dos pacientes. **Conclusões:** Pode-se concluir que as fraturas do osso zigomático foram as fraturas faciais mais prevalentes no grupo de indivíduos estudados, tendo acometido principalmente homens na terceira década de vida, vítimas de acidentes de trânsito, tratados principalmente com redução aberta e fixação interna estável. **Palavras-chave:** Traumatismo facial; Estudo de prevalência; Etiologia; Epidemiologia; Cirurgia maxilofacial.

RESUMEN

Introducción: Los traumatismos maxilofaciales se producen con frecuencia porque la cara está anatómicamente expuesta y sus huesos son frágiles. Por ello, conocer la frecuencia y distribución de los casos de fracturas faciales en una población puede ayudar a establecer prioridades de investigación para el tratamiento eficaz y la prevención de estas lesiones. **Objetivos:** El objetivo de este estudio fue relevar los datos contenidos en las historias clínicas de los pacientes con trauma maxilofacial del Hospital Universitario Docente Dr. Darío Contreras entre los años 2014 y 2019. **Metodología:** Se trata de un estudio epidemiológico descriptivo retrospectivo. De esta manera se buscó: Identificar el tipo de fractura prevalente en esta ciudad, la etiología principal y el sexo y grupo etario más afectado. La muestra estuvo constituida por 6.525 historias clínicas de pacientes afectados por traumatismos faciales. Los datos recogidos fueron: edad, sexo, etiología, localización anatómica y forma de tratamiento. Tras recoger los datos, se organizaron y tabularon en una hoja de cálculo Excel para Windows. Se analizó la incidencia de las etiologías y se correlacionó con el sexo de los pacientes afectados. También se evaluó la incidencia de las fracturas en función de su localización anatómica y, a continuación, se correlacionó con el tipo de tratamiento. A continuación se realizó estadística descriptiva, con el objetivo de mostrar una visión global de la prevalencia de los datos recogidos, mostrando su distribución mediante gráficos y tablas. **Resultados:** El estudio comprendió 6229 individuos con traumatismos maxilofaciales. Los varones presentaron la mayor incidencia (73,69%) en la tercera década de la vida. Las principales etiologías fueron los accidentes de tráfico (61,59%), seguidos de las agresiones (22,62%). De todas las fracturas, el 70,20% se produjeron en el tercio medio de la cara, siendo el hueso cigomático y los huesos nasales las regiones más afectadas. En la mandíbula, las regiones más afectadas fueron el cuerpo y el ángulo. En cuanto al tratamiento, la reducción abierta y la fijación interna rígida representaron la forma de tratamiento para la mayoría de los pacientes. **Conclusiones:** Se puede concluir que las fracturas del hueso cigomático fueron las fracturas faciales más prevalentes en el grupo de individuos estudiados, afectando principalmente a hombres en la tercera década de la vida, víctimas de accidentes de tráfico, tratados principalmente con reducción abierta y fijación interna estable. **Palabras clave:** Trauma facial; Estudio de prevalencia; Etiología; Epidemiología; Cirugía maxilofacial.

INTRODUCTION

Maxillofacial trauma is among the most common causes in hospital emergency departments, causing soft tissue injuries and facial fractures^[1].

Etiologies vary from country to country, and even within the same country, as well as between male and female populations. This diversity largely depends on awareness and education about traffic laws, socioeconomic, cultural, and environmental factors, and therefore remains a topic of discussion^[2].

Understanding the frequency and distribution of cases of facial fractures in a population can help establish research priorities for effective treatment and prevention of these injuries^[3].

The Dominican Republic is a country located on one of the Caribbean islands, with 10.74 million inhabitants and bordering Haiti. In the Dominican Republic there is only one Oral and Maxillofacial Surgery Residency Program for dental surgeons that offers 6 places per year and one Oral and Maxillofacial Surgery residency program for doctors that offers 2 places per year. Comprehensive data on the etiology and pattern of maxillofacial trauma is not readily available in the Dominican Republic.

For this reason, the aim of this study was to determine the etiology, trauma pattern and treatment modalities in individuals affected by maxillofacial trauma at the Hospital Docente Universitario Dr. Darío Contreras, in the city of Santo Domingo, capital of the Dominican Republic.

MATERIAL AND METHODS

After an international academic cooperation agreement with the Hospital Docente Universitario Dr. Darío Contreras, the study was approved by the ethics and research committee of the hospital under number 2019-2020.69.4.2

The study consisted of a descriptive retrospective epidemiological survey, as it describes the frequency and distribution of diseases in the studied sample, but with past data, at only one point in time, being cross-sectional.

The study was carried out using the database of files from the department of maxillofacial surgery and traumatology, Hospital Docente Universitario Dr. Darío Contreras.

The inclusion criteria were the medical records with complete information about the affected individual, about the etiologies called: traffic accidents, aggression, work accidents, falls and wounds caused by firearms, in addition to information about the treatment performed.

Exclusion criteria were medical records with incomplete data on the individual's age, gender, and etiology of the trauma, as well as records that did not indicate the type of treatment performed.

The medical records of individuals affected by maxillofacial trauma in the maxillofacial Surgery and Traumatology service were analyzed during a 5-year period, from November 1, 2014, to November 30, 2019. Data collected from medical records were age, gender, etiology of trauma, anatomical location of fractures, type of treatment.

The etiology of trauma was classified as: (1) traffic accidents, (2) aggression, (3) firearm injuries, (4) falls and (5) work accidents.

Facial fractures were classified according to their anatomical location into: (1) nasal bone fracture, (2) orbit fractures, (3) naso-orbito-ethmoidal complex fractures, (4) zygomatic bone fractures, (5) Le Fort I fractures, (6) Le Fort II fractures, (7) Le Fort III fractures, (8) mandibular fractures (symphysis, parasymphysis, body, angle, branch, coronoid process, and condyle).

Treatment was classified according to type into closed reduction, open reduction with stable internal fixation, and conservative treatment.

After collecting the data, they were organized and tabulated in an Excel spreadsheet for Windows. The incidence of etiologies was analyzed and correlated with the gender of affected patients. The incidence of fractures according to their anatomical location was also evaluated, and later correlated with the type of treatment. Descriptive statistics were then performed, with the aim of showing an overall view of the prevalence of the data collected, showing its distribution through graphs and tables.

RESULTS

A total of 6,525 medical records were found, of which 296 were excluded due to duplication of data or because they contained an incomplete clinical history, regarding etiology, type of fracture and treatment instituted. Thus, our study sample consisted of 6,229 individuals who had 9451 fractures.

The survey showed a greater predominance of males (4590 males – 73.69%) over females (1639 females – 23.18%) (Figure 1).

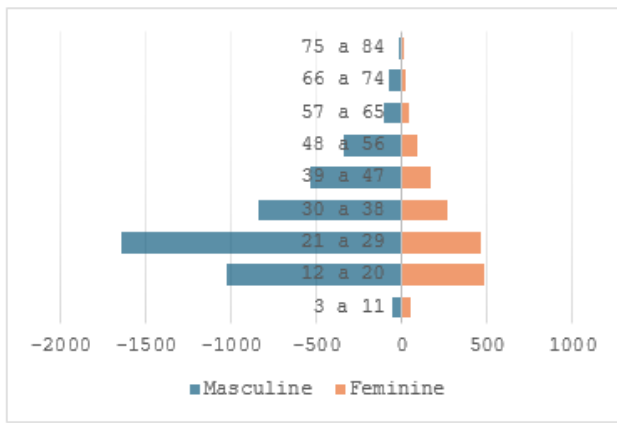


Figure 1 -Age and gender distribution

Analyzing the distribution of patients, victims of facial trauma, treated at the Hospital Docente Universitário Dr. Darío Contreras, according to age group, we found a predominance of young adults aged 21 to 29 years (Table 1).

Table 1 -Age and gender distribution

AGE RANGE	MASCULINE (n)	FEMININE (n)	TOTAL	%
3 - 11	53	48	101	1,63%
12 - 20	1029	483	1512	24,27%
21 - 29	1641	463	2104	33,78%
30 - 38	836	265	1101	17,68%
39 - 47	536	170	706	11,33%
48 - 56	339	92	431	6,92%
57 - 65	105	37	142	2,27%
66 - 74	80	21	101	1,62%
75 - 84	20	11	31	0,50%

In figure 1, we observe that the Hospital also receives pediatric and geriatric patients in the Maxillofacial Surgery Sector, albeit to a lesser extent.

In the middle third of the face, 6635 cases were observed, with the most frequent being zygomatic bone fractures, followed by nasal bone fractures, Le Fort I, frontal sinus fractures, naso-orbitoethmoidal complex fractures, orbital fractures, Le Fort II (N=288) and Le Fort III (N=34) (Figure 2).

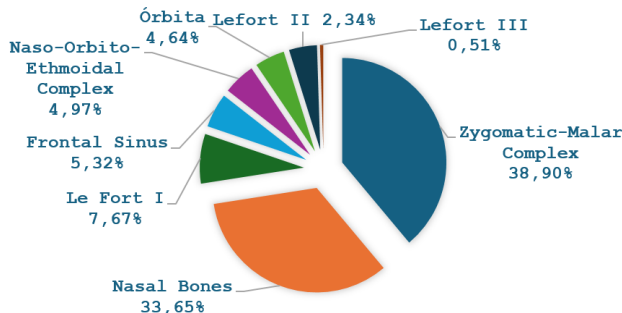


Figure 2 -Anatomical sites of middle third facial fractures

Of the mandibular fractures, 2816 cases were observed, with the body region being the most affected, followed by the angle, condyle, parasymphysis, symphysis, branch, and coronoid process (Figure 3).

When considering the etiology of maxillofacial trauma, the most common cause found was traffic accidents, followed by aggression, falls, work accidents and firearm injuries (Figure 4).

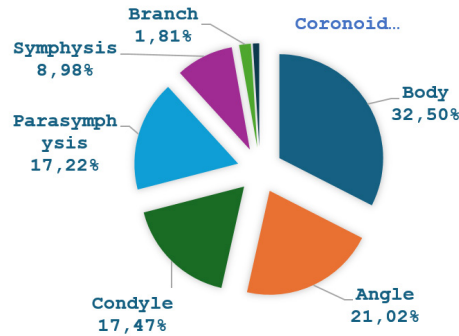


Figure 3 -Anatomical sites of mandibular fractures

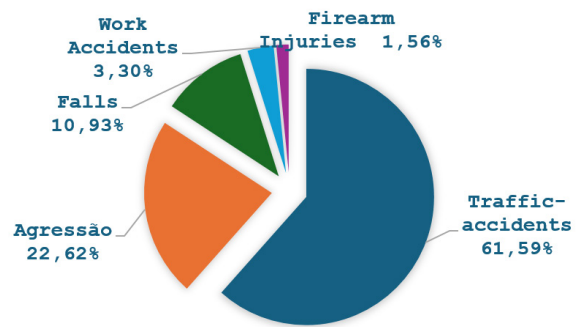


Figure 4 -Etiology of trauma

Even though there are more men than women affected by maxillofacial trauma in this study, we found that the prevalence of etiologies was similar in both groups.

The most used type of treatment was open reduction associated with stable internal fixation, followed by closed reduction, and conservative treatment (Figure 5).

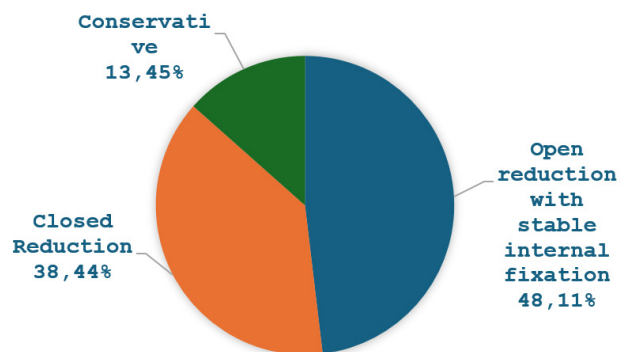


Figure 5 -Types of treatment

DISCUSSION

The literature points to a higher prevalence of facial trauma for males^[4,5,6,7,8,9,10,11]. In this study, it was observed that 73.69% of the individuals assisted were men in their third decade of life. This alerts us to the economic impact of maxillofacial trauma, since the affected individual is possibly in frank professional activity and must leave their activities for a variable period, which generates costs for the government and health services. Many of the epidemiological studies indicate that the prevalence of individuals affected by maxillofacial trauma is in the third decade of life^[12,13,14,15]. However, in this study it was observed that the age group mainly affected was from 21 to 29 years old.

Although many studies show that the mandible is the anatomical site mainly affected when it comes to facial trauma^[16,17,18]. In this study, fractures in the middle third of the face were prevalent (70.20%) when compared to mandibular fractures (29.80%). As most of the fractures found were in the zygomatic bone (n=2580). There are also other studies in the literature where the zygomatic bone was mainly affected^[5,8,9,11,19,20,21].

In this study, it was found that traffic accidents and aggression were the main cause of facial fractures, in agreement with other epidemiological studies of this type^[3,11,18,22].

When it comes to treatment for maxillofacial trauma, there are many studies that point to open reduction with stable internal fixation as the main treatment. Likewise, in this study, open reduction with stable internal fixation was found to be the main treatment of choice (48.11%)^[3,11,18,23].

A factor that drew attention was that 1/3 of the nasal fractures were treated with open reduction and stable internal fixation. It was found that there was an error in filling out the records, as reductions were performed with surgical access, but not with the use of fixation material.

In this sense, open reduction associated with internal fixation with load-bearing reconstruction plates provides stable, predictable, and economical results^[24]. However, due to the socioeconomic level of the population and the fact that the patient must bear with the cost of the fixation material, many of the cases are still treated with fixation with steel wire and maxillomandibular locking.

In conclusion in this study, zygomatic bone fractures were the most prevalent, with traffic accidents being the main etiology. The male gender was mainly affected, with the majority in the third decade of life and mainly treated with open reduction and stable internal fixation. The completion of this work highlights the need for the Dominican

Republic's health services to introduce electronic medical records systems, as well as database systems for imaging exams.

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