

Craniofacial trauma: experience in private hospital care during the pandemic provoked by SARS-CoV-2

Trauma craneofacial: experiencia de atención en un hospital privado durante la pandemia provocada por SARS-CoV-2

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Abstract

Background: The onset of the SARS-Cov-2 pandemic brought with it important changes in the hospital care for all diseases. According to the international literature, since the beginning of the pandemic there has been an impact in the incidence, etiology, and severity of head trauma, all these changes as a direct consequence of lockdown. **Objective:** In this article we analyzed the characteristics of craniofacial trauma in patients admitted to a private hospital in Mexico City during the SARS-CoV-2 pandemic. **Method:** Medical records from patients admitted in Medica Sur between March 2020 and June 2021. In this study, incidence, etiology, severity of the injuries and the SARS-CoV-2 PCR result performed upon admission were analyzed. **Results:** Although there is no study in Mexico like ours, the results were similar to those reported by other hospital centers worldwide, presenting a greater number of cases classified as mild craniofacial trauma, in addition to finding that the main age group affected were older adults. **Conclusions:** The reported information in our study provides a general view of craniofacial trauma characteristics during SARS-CoV-2 pandemic.

Keywords: COVID-19 pandemic. SARS-CoV-2 pandemic. Cranioencephalic trauma. Craniofacial trauma. Facial injuries.

Resumen

Introducción: El inicio de la pandemia provocada por SARS-CoV-2 trajo consigo importantes cambios en los cuidados hospitalarios para todas las enfermedades. De acuerdo con la literatura internacional, desde el comienzo, y a consecuencia del aislamiento, ha existido un impacto en la incidencia, la etiología y la gravedad del trauma craneomaxilofacial. **Objetivo:** Estudiar las características del trauma craneofacial en los pacientes ingresados a un hospital privado en la Ciudad de México durante la pandemia por SARS-CoV-2. **Método:** Se revisaron los expedientes clínicos de los pacientes ingresados a Médica Sur, entre marzo de 2020 y junio de 2021. Se analizaron la incidencia, la etiología, la gravedad de las lesiones y el resultado de la prueba de reacción en cadena de la polimerasa para SARS-CoV-2 que se realizó durante la atención hospitalaria. **Resultados:** En México no existe un estudio semejante al nuestro, pero los resultados fueron similares a los reportados por otros centros hospitalarios en el mundo, presentando un mayor número de casos clasificados como traumatismo craneofacial leve, además de encontrar que el principal grupo de edad afectado fueron los adultos mayores. **Conclusiones:** La información reportada en nuestro estudio brinda un panorama general sobre las características del trauma craneofacial durante la pandemia por SARS-CoV-2.

Palabras clave: Pandemia COVID-19. Pandemia SARS-CoV-2. Trauma craneoencefálico. Trauma craneofacial. Lesiones faciales.

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Introduction

With the start of the SARS-CoV-2 pandemic, the dynamics of hospital care have denoted a change in care protocols, the prioritization of procedures and the type of intervention, and have even modified the quality and quantity of care services provided, both public and private^{1,2}.

Head and neck represent less than 12% of the total body surface, but the severity of their injuries is highly variable, from small superficial wounds to extensive injuries that can condition life³.

The SARS-CoV-2 pandemic generated an important change in the incidence, etiology, and severity of head and craniofacial trauma, as a consequence of the isolation of the population². Within this context, a series of epidemiological results have been obtained depending on each center, according to the population, the location of the lesion, the surgical management and the medical division in charge of the patient's intervention⁴. The literature consulted highlights that the main causes of facial trauma are car accidents and injuries associated with sports, events that could have been reduced due to confinement; however, falls and domestic accidents continue to be important causes to consider⁵.

Worldwide, in 2017, 7.5 million cases of severe craniofacial trauma culminating in fracture and the need for surgical intervention were reported. In terms of age-standardized incidence and prevalence, global rates were 98 cases per year per 100,000 inhabitants in urban areas, with falls being the predominant cause in most regions⁶. However, this information varies widely depending on the region. Rampa et al.⁷, in California, United States, where they reviewed the records recorded in the California State Emergency Department Database between 2005 and 2011, report that the main causes of facial fractures were falls, firearm injuries, accidents traffic and assaults. They found that, of the 198,870 cases in the files reviewed, 71% corresponded to men, with an average age of 35.7 years. The most frequently reported injuries were closed fractures of the nasal bone, orbit, maxilla, and mandible.

In our country, the figures reported by the Ministry of Health and the Mexican Social Security Institute, between 2003 and 2011, show an incidence of 10,000 to 100,000 new cases of cranioencephalic and craniofacial trauma per year, as well as 60 to 90 cases each year per 100,000 Mexicans in urban areas⁶.

Men between the ages of 20 and 30 are the population group with the highest risk of suffering some type of facial trauma, this is related to their greater degree of physical activity⁸.

Method

A search was made of the clinical records of patients admitted to Médica Sur between March 11, 2020 and June 30, 2021, with a diagnosis that included injuries described in the file as craniofacial trauma, facial injury, or head trauma.

The only exclusion criterion was the absence of the data studied. In each case, the diagnosis with which they were admitted, the date, sex and reason for hospital care was identified, which was classified according to the most common causes found in our search: falls, vehicular accidents with and without belts, motorcycle accidents with and without a helmet, bicycle accidents with and without a helmet, sports-related injuries, violence, and place where the accident occurred (inside or outside the home). Cases were classified by age group as pediatric (0-10 years), adolescents (11-20 years), young adults (21-39 years), adults (40-64 years), and geriatrics (≥ 65 years).

The lesions were classified, according to the depth and involvement of structures, as superficial (those that involved only the skin and soft tissues) or deep (those in which fractures or intracranial lesions were demonstrated). In the case of head trauma, its severity was classified as mild, moderate, or severe, according to the Glasgow Coma Scale reported at the time of medical attention. If surgery was required, this was classified according to the type of intervention performed.

The days of hospitalization were counted from the moment of admission to the hospital until the last day of stay, and deaths were reported. All patients admitted to the hospital during the study period underwent a polymerase chain reaction (PCR) test for SARS-CoV-2, the positive or negative result of which was collected.

The date of the registered cases was compared with the state of the epidemiological traffic light in Mexico City; for didactic purposes, only three categories were included: high risk (red), moderate risk (yellow) and mild risk (green).

The information was collected in an Excel spreadsheet® (Microsoft Corp., Redmond, WA, 2016) and analyzed using the IBM Statistical Package for the Social Sciences version 25.0 statistical program.

Results

In total, there were 161 cases of craniofacial trauma that were admitted to our institution between March 11, 2020 and June 30, 2021. Of the total number of patients operated, 51% were women ($n = 82$) and 49% men ($n = 79$).

The reported mean age was 50 years, including patients younger than 1 year up to 95 years. The age group in which the greatest number of injuries occurred was geriatric ($n = 57$; mild trauma 36, moderate trauma 15, severe trauma 6), followed by adults ($n = 45$; mild trauma 34, moderate trauma 5, severe trauma 6), young adult ($n = 37$; mild trauma 29, moderate trauma 7, severe trauma 1), adolescent ($n = 7$; mild trauma 4, moderate trauma 3, severe 0) and pediatric ($n = 15$; mild trauma 11, moderate trauma 2, severe trauma 2) (Fig. 1).

The main causes were falls ($n = 102$; 63%), physical exercise ($n = 15$; 9%), vehicle with seat belt ($n = 11$; 7%), bicycle with a helmet ($n = 8$; 5%), violence ($n = 7$; 4%), motorcycle with a helmet ($n = 6$; 4%), vehicle without seat belt ($n = 5$; 3%), bicycle without a helmet ($n = 4$; 3%) and motorcycle without a helmet ($n = 3$; 2%) (Fig. 2).

Of the total cases ($n = 161$), 45% occurred at home ($n = 73$) and 55% outside the home ($n = 88$). Only two patients were admitted with positive PCR for SARS-CoV-2 without symptoms associated with COVID-19.

Wound sites with active bleeding or major lacerations in each patient were categorized, with reports of 129 wounds and 3 abrasions in 132 patients; there were 29 patients with a description of "without evidence of superficial or deep wound on tomography and physical examination". The most common bone regions with active bleeding or visible wounds among the 129 reported were the frontal ($n = 35$; 28%), the occipital ($n = 25$; 19%), the orbital ($n = 22$; 17%), parietal ($n = 18$; 14%), temporal ($n = 17$; 13%) and maxillary ($n = 12$; 9%) (Fig. 3).

The most frequent complication associated with severity in all the patients reported was subarachnoid hemorrhage ($n = 19$; 12%). The classification for the most common reason for going to hospital was superficial wound ($n = 134$; 83%), with an average length of 3.5 cm, followed by deep wound ($n = 27$; 17%).

Most of the patients were managed conservatively, without the need for primary closure or surgical intervention ($n = 85$; 53%). In the 76 patients who received surgical management, this consisted of primary

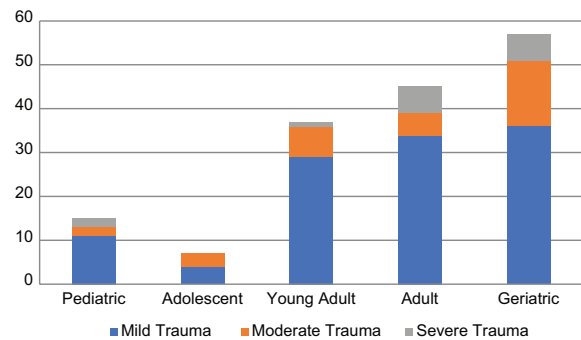


Figure 1. Comparison of the frequency of cases registered by age group at the time of the study.

closure ($n = 36$; 47%), cranial reconstruction ($n = 16$; 21%), rhinoplasty ($n = 11$; 15%), fracture reduction ($n = 8$; 10%) or other ($n = 5$; 7%) (Fig. 4).

The ratio of occurrence of events related to the pandemic was compared with the category of level of risk by epidemiological traffic light provided by the federal government of Mexico. Due to the multiple changes, it was decided, for didactic purposes, to cover only three categories: high risk (red), moderate risk (yellow) and slight risk (green). A relationship of 12 months of high risk, 5 months of moderate risk and 1 month of mild risk was obtained in Mexico City, in which the frequency of cases is distributed for each month (Fig. 5).

During the mild risk period (green), 2% of all cases ($n = 4$) were reported, of which 50% ($n = 2$) occurred outside the home. During the period of moderate risk (yellow), 23% of all cases ($n = 37$) were reported, of which 64% ($n = 24$) occurred outside home. During the high risk period (red), 75% of all cases ($n = 120$) were reported, of which 52% ($n = 62$) occurred outside home.

Two cases with positive PCR for SARS-CoV-2 were reported. Both were admitted during the period classified as high risk (red) and belonged to the age group classified as young adults. In the first case, the injury occurred outside the home while riding a bicycle with a helmet on, it was classified as mild head injury and was treated conservatively. The second occurred outside home, aboard a motor vehicle, the injuries were classified as moderate head trauma and required primary closure. The outcome of both patients was favorable.

The mean hospitalization time of the patients was 4 days. Three deaths were reported, all in the geriatric age group and were patients with multiple comorbidities prior to going to the hospital. In two cases, the

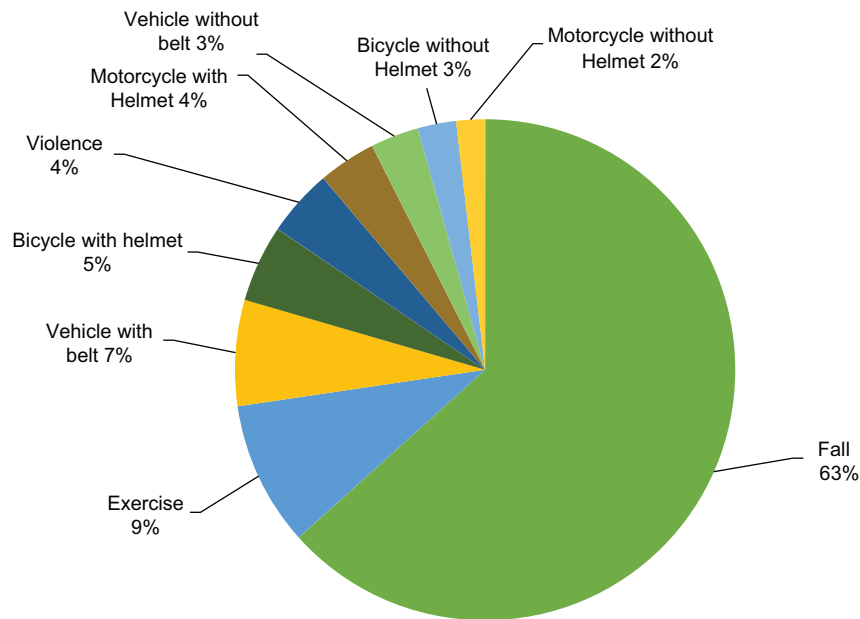


Figure 2. Relationship of the number of cases according to the etiology presented.

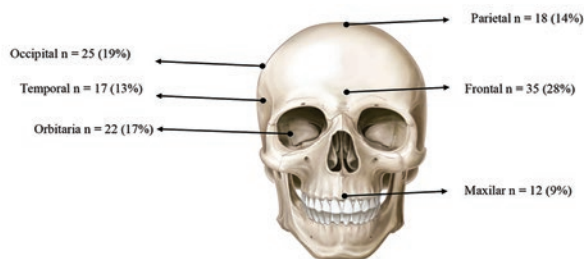


Figure 3. Distribution of wounds by bone areas.

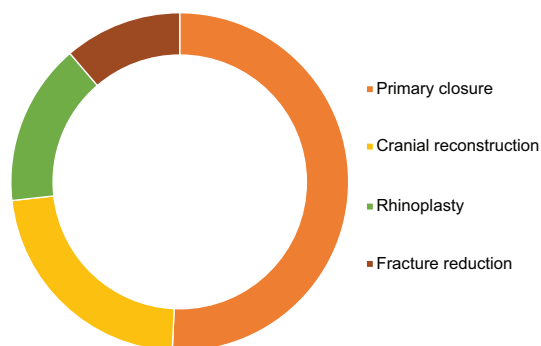


Figure 4. Distribution of management described for surgical interventions.

injuries occurred inside home. In all three cases, the injuries were classified as severe head trauma and two required surgical intervention.

Discussion

More than 1 year after the start of the SARS-CoV-2 pandemic, the amount of information available on the incidence, severity, and management of craniofacial trauma is extremely scarce, and the evidence from each hospital center is limited. Goyal et al.⁹ studied 129 patients and reported a reduction in the general incidence of injuries of 16.8% when compared to the same period of the previous year, while the incidence of injuries classified as serious presented an increase of 156.25% (59 mild [45.7%], 23 moderate [17.8%], 47 severe [36.4%]), similar to what was reported in the study by Boutray et al.¹⁰, who analyzed the impact of the current pandemic on the incidence of facial trauma in 13 French hospitals and found a decrease in the incidence of facial trauma of 65.5% compared to the incidence reported in the same period in 2018; however, the rate of complex fractures was higher than before the pandemic. This increase in the severity of the trauma is a truly alarming situation that coincides in several of the studies analyzed and contrasts in others. In our study, trauma classified as severe (n = 15; 9.3%) was the least common of the three, with injuries classified as minor (n = 115; 70.1%) the most frequent type.

In the study by Canzi et al.¹¹ carried out at the Hub Trauma Center, a trauma reference center in Milan, compared the cases admitted during the pandemic

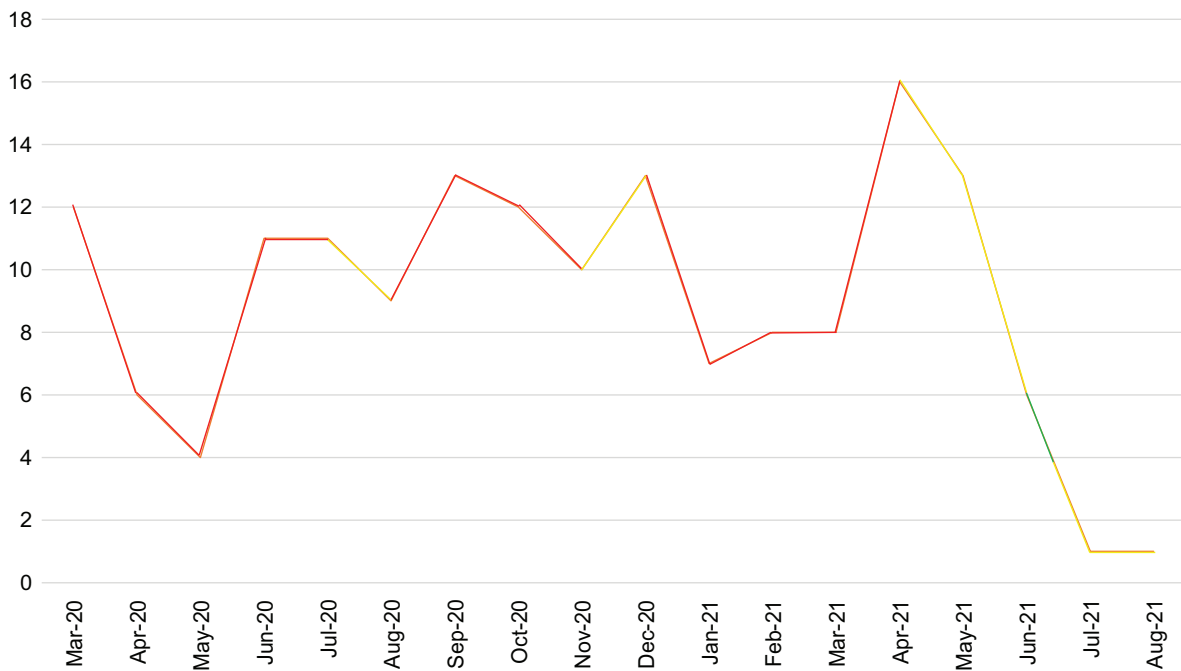


Figure 5. Relation of the results obtained against the traffic light of the Federal Government of Mexico. Red color: high risk; yellow color: intermediate risk; green color: low risk.

with those admitted in the same period of time in previous years. It was found that they had a mean age greater than that of previous years (46.8 years), similar to that reported in our study (50 years), with a percentage of surgical management of 34%, which in our report was 24.84%. When assessing the incidence with the epidemiological traffic light, they found an increase in cases when the sanitary restrictions decreased, while in our study the incidence was not affected by changes in the epidemiological traffic light, probably due to differences in the length of the study period and the long time that Mexico City remained at high risk. In our data analysis compared with the epidemiological traffic light, a significant decrease in cases was observed in the last 3 months of the study of events. Taking into account the economic impact generated by the pandemic, it is possible to attribute one of the causes of the decrease in cases to economic spending in the population, taking into account that the study was carried out in a third-level private hospital, in which the majority of patients depend on medical expenses insurance as the main support during their hospital stay.

Abbate Ford et al.¹² refer to the change in the type of cranioencephalic emergencies reviewed during the pandemic in the Indian population, with an increase

in the etiology related to family violence. This information contrasts with that reported by Sinha et al.¹³ in a neurosurgery center in England, whose most frequent cause of hospital admission was falls, a situation that coincides with what was reported in our study. Similarly, Pinggera et al.¹⁴ reported an increase in cases of falls, mainly in the group of older patients. In this latest study, most of the cases reviewed correspond to head injuries classified as mild.

Despite the fact that our report is limited to the analysis of cases during the pandemic period and previous years are not considered, the results obtained are very similar to those reported by other centers, presenting a greater number of cases classified as mild. In addition, we found that the main age group affected was the elderly and that the main cause of hospital admission was falls that occurred within the home.

Conclusions

The SARS-CoV-2 pandemic had a significant impact on the lifestyle of the population and on the search for medical care. Despite the fact that there is no national information on the impact of the pandemic on craniofacial trauma, the results obtained in our study

coincide with those reported in the international literature. The information obtained in our study provides an overview of the characteristics of craniofacial trauma during the SARS-CoV-2 pandemic.

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Conflicts of interest

The authors declare no conflicts of interest.

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