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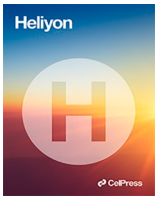

Pediatric maxillofacial and oral traumatological emergencies in the department of stomatology, maxillofacial and plastic surgery of the university hospital of cocody (republic of IVORY COAST)

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ABSTRACT

Introduction: Maxillofacial and oral trauma in children are a frequent reason for consultation in stomatology and maxillofacial surgery.
Patients and methods: Retrospective study with a descriptive aim, carried out on the basis of an analysis of the physical medical files of cases of maxillofacial and oral trauma admitted to the stomatological emergencies of the university hospital center of cocody over a period of 04 years (January 2016 to December 2019).
Results: The average age of the patients was 7.56±2.1 years with extremes of 05 days of life and 15 years. The sex ratio was 1.56. The age group between 05 and 09 years old was the most affected with 43.12% (n = 113/262). Road accidents were the main cause of these injuries with a prevalence of 65.65% (n = 172/262). In 68.32% of the cases (n = 179/262), the soft tissues were affected, while the bones and dental injuries represented respectively 18.32% (n = 48/262) and13.36% (n = 35/262).
Conclusion: Know and master the specificities of maxillofacial and oral trauma in children anatomy helps to avoid a preventable delay to the diagnostic, and to reduce long-term complications.

1. Introduction

The catchword 'maxillofacial emergency' was pronounced during the second world war by Virenque for the first time; and it meant there was a serious need and emergency to make the injury of the face be handled by a specialist [1]. From a surgical point of view, trauma is defined as the result of a moving physical force on an inert object [2]. From a nosological point of view, three types of emergencies can be distinguished. Immediate absolute urgency; which is life-threatening and requires critical intervention within minutes of the trauma. Relative immediate urgency; which jeopardizes the subsequent functional and aesthetic prognosis and requires appropriate care in the hours that follow. Deferred urgency; which endangers the functional and aesthetic prognosis and requires appropriate intervention in the days that follow. Maxillofacial and oral traumatological emergencies occur at all ages, however are

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increasingly frequent in children with 2 frequency peaks: 12–36 months, walking age, then in adolescence, a certain autonomy [3–5]. These traumas occur in a variety of circumstances.

The lack of recent data on facial trauma in children, their frequency and the lack of adequate care in our context, constituted the reasons for this study, the objective of which is to describe the socio-demographic aspects and to identify the various nosological varieties of these traumas.

2. Methods

Type of study: This is a retrospective study carried out on the basis of an analysis of the physical medical records of cases of maxillofacial and oral trauma admitted to the stomatological emergencies of the university hospital of Cocody.

Eligibility criteria: Data from complete medical files of patients aged 0–15 years withmaxillofacial trauma with traumatic origin from January 2016 to December 2019 were included. Inconsistent or incomplete records were excluded.

2.1. Data collection

- Epidemiological data:
  - sex, age classified by age group, date, mechanism,
  - etiology of the trauma: road accident, sports accident, play accident, domestic accident, other.
- clinical and paraclinical data:
  - Type of injury: soft tissue wound, bone injury, alveolar-dental fracture;
  - The location of the injuries according to the levels of the face: the lower level, the middle level, the upper level;
  - The site of facial fractures: mandibular, nasal, maxillary, zygomatic;
  - The site of mandibular fractures: condyle, ascending ramus, angle, horizontal ramus, symphysis;
  - The type of dental injury: luxation (complete or partial), dental contusion, dental and alveolar fracture.

Sampling methods: We used a non-probability sampling method for patients admitted to stomatological emergencies over the period.

Sample size: The sample size (n) was determined according to the following formula:

$$N = [\mathcal{E}^2 \times P \times (1\text{-}P)] / m^2 = [(1.96)^2 \times 0{,}05 \times (1\text{–}0{,}05)] / 0{,}05^2 \approx \mathbf{113}$$

N = sample size
p = prevalence (5%)
m = 5% margin of error
$\mathcal{E}$ = 1,96

2.2. Statistical analysis

- Data entry was done in Excel 2016
- The tables and graphs were processed by an Excel version 2016 table
- For the quantitative variables, we calculated the mean and standard deviations. For some of them, we specified the median value and the extremes.
- For the qualitative variables, we calculated the proportions

Our study was conducted with strict respect for the anonymity of the patients and the confidentiality of the information collected.

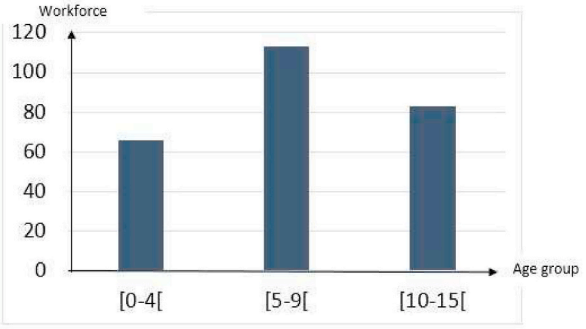

Fig. 1. Distribution by age group.

3. Results

Maxillofacial and oral trauma in children accounted for 20% (n = 262/1048) of all injuries involving the cephalic extremity. The mean age of onset was 07.56±2.1 years with extremes of 05 days of age to 15 years. The most affected age group was between 05 and 09 years with a prevalence of 43.13% (Fig. 1). There was a male predominance with a sex ratio of 1.59. In 98.7% of cases, the mechanism was direct. Road traffic accidents were the most frequent etiology with a proportion of 65.65% of cases, followed by domestic accidents, 11.83% (Fig. 2). The different types of injuries were: soft tissue injuries 68.32%, bone injuries 18.32% and alveolar-dental injuries 13.36%. 79.33% of the soft tissue injuries were wounds and 20.67% were bruises. These lesions were most often located on the upper floor (30.73%) and in 16.20% of cases involved more than one floor. Bone injuries were more frequent in the mandible (Table 1), while nasal bone fractures were more frequent in the facial region. Condylar fractures were most frequent in the mandible (Table 2). 42.90% of the dental injuries were represented by dental dislocations (Table 3) and these injuries were more common in the upper incisor block in a proportion of 77% (Fig. 3). 12 cases of partial dislocation were noted, 7 of which were due to dental ingression (Table 4). Most injuries occurred in December (Fig. 4).

4. Discussion

With a prevalence of 20% of all facial injuries, maxillofacial and oral trauma in children is an important part of stomatological pathology. Several studies have estimated the prevalence to be between 5 and 15% [6–8]. The average age of our patients was 07.56 years and the age group between 05 and 09 years was the most affected with 43.13%. This result is similar to that of Alcada-Galiano et al. [9] who found two peaks of occurrence, the first between 06 and 07 years and the second between 12 and 14 years. This period corresponds to the school period but also to the beginning of the child's autonomy. Sometimes left to their own devices, they engage in dangerous games. A male predominance was noted with a sex ratio of 1.59. This male predominance has been found in the literature [6,7,9,10]. This could be explained by the fact that male children are more physically active than girls, but also that they engage in more dangerous play. Road accidents, with a proportion of 65.65%, were the main cause, followed by domestic accidents (11.83%). In our case, this can be explained by the lack of supervision of children and the lack of knowledge of traffic regulations by motor vehicle drivers. Our results are different from those of AL Shedri S.Z. et al. [11] who in their study found "fall" as the first cause 64.4%. December was the most traumatic month. It is the last month of the year, corresponding to the holidays. During this period, there was a slackening in the supervision of children, motor vehicle drivers also behaved at risk by not respecting traffic regulations and driving under the influence of alcohol. Soft tissue injuries with a proportion of 68.32% were the most frequent, followed by bone injuries (18.32%) and alveolar dental injuries (13.36%). Of these soft tissue injuries, 79.33% were wounds and 20.67% were bruises. These lesions were most often located at the upper level. This could be explained by the prominent nature of the forehead in children during the early years of their growth. Our results differ slightly from those of Al Shedri who found a soft tissue involvement of 56.8%, of which 41.2% were wounds [11].

At the level of the facial skeleton, the mandible was the most affected in our study (n: 30). The preferred site of these mandibular injuries was the condyle. These were serious fractures, exposing major risks when ignored: temporomandibular ankylosis and facial growth disorders. In the facial range, the nasal bones were the most affected (n: 12). These results are similar to those found in the literature [12]. This can be explained by the fact that this is a region of predilection for lesions, both bony and soft tissue, as they represent the points of impact of the face (forehead, nose, mandible: chin). In terms of dental injuries, dislocations were the most frequent, at 42.86%, followed by contusions. In 77% of cases, these dental injuries were located in the upper incisor block. In 12 cases, there was partial dislocation, including 7 ingressions. From a therapeutic point of view, it is important to establish the chronological order of treatment according to the lesions, without delaying the repair of facial wounds. Above all, vital risks should be assessed: asphyxia, haemorrhage, infectious and neurological risks. Management according to stages A, B, C, D, E [11,13,14] Airways: ensures oxygenation, upper airway patency, reliable protection of the cervical spine. Actions to be taken: suction, mandibular subluxation in the absence of a fracture, if necessary a tracheotomy. Breathing: inspection of the thorax, auscultation and palpation (search for a flap, subcutaneous emphysema). Actions to be taken, exsufflation, chest drainage, intubation. Circulation: look for clinical signs of shock and a possible source of bleeding. Actions to be taken, compressions, emergency haemostasis, insert two large bore catheters and pass

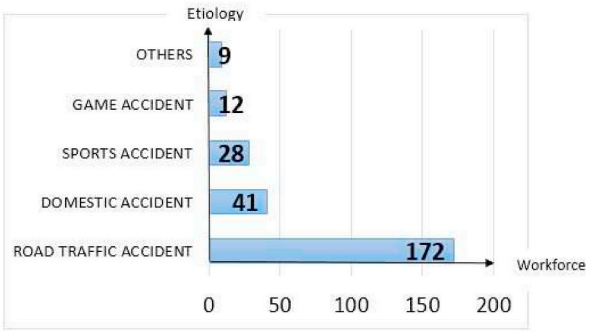

Fig. 2. Distribution by etiology.

Table 1
Distribution by location of bone lesions.

Location	Total	Percentage (%)
Mandible (lower level)	30	62,5
Facial massif (middle level)	15	31,25
Forehead (upper level)	3	6,25

Table 2
Distribution of fractures in the mandible.

Location	Total	Percentage (%)
Condyle	13	43,34
Angle	9	30
Rising branch	3	10
Symphysis	5	16,66

Table 3
Distribution by type of dental lesions.

Lesions	Total	Percentage (%)
Dislocations	15	42,86
Alveolodental fracture	6	17,14
Dental fracture	4	11,43
Dental contusion	10	28,57

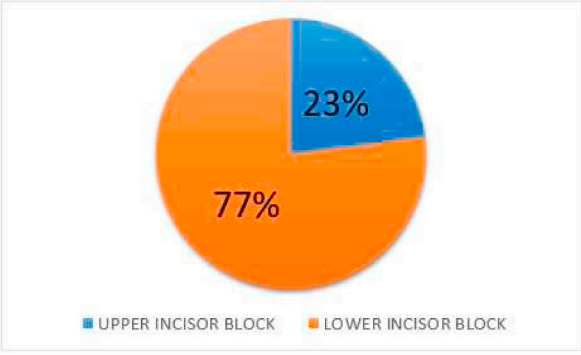

Fig. 3. Distribution by location of dental lesions.

Table 4
Distribution by type of dislocation.

Types of dislocation		Number
Total dislocation	3	
Partial dislocation	12	Ingression 7 Egrssion 6

crystalloids.

Disability: make a brief assessment of the central nervous system. Assess Glasgow score and pupil reactivity. Exposure and prevention of hypothermia: record all lesions present and monitor coverage to avoid hypothermia.

Limitations of the study: During the literature review related to our study, we were confronted with insufficient data in the African literature on pediatric maxillofacial and trauma emergencies. Also, it should be noted that at the time of data collection, a large number of medical records were not useable, reducing the sample size. Despite this, we were able to obtain a representative sample of the population.

5. Conclusion

Maxillofacial and oral trauma are commonly frequent in children. They occur as a real public health problem. Roads traffic

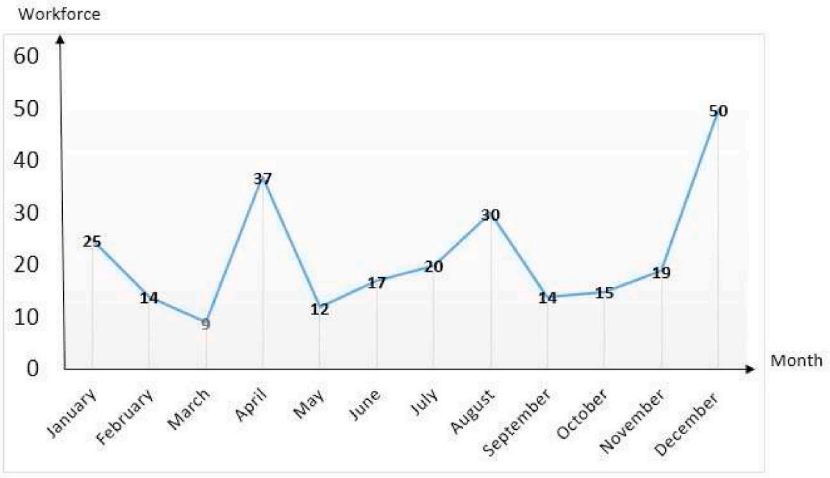

Fig. 4. Distribution by month.

accidents are the main cause. Lesions observed during these traumas have to be known by any doctor and their care must be devolved to the specialist. The monstrous deformations induced by these traumas should not lead to unconsciousness of associated lesions that could be life-threatening.

Author contribution statement

Marc K. Koffi; Opokou De Misères Alexandre Ory: Conceived and designed the experiments; Wrote the paper.
Koboh Sylvie Atsé-N'guessan: Performed the experiments.
Koffi Laurent Boka; Ake lucien jonathan Yapo; Rokiatou Koné; Bakary Ouattara: Analyzed and interpreted the data.
Affoué linda Koffi; Lucien Asseke: Contributed reagents, materials, analysis tools or data.

Data availability statement

The data that has been used is confidential.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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