



This article appeared in a journal published by Elsevier. The attached copy is furnished to the author for internal non-commercial research and education use, including for instruction at the authors institution and sharing with colleagues.

Other uses, including reproduction and distribution, or selling or licensing copies, or posting to personal, institutional or third party websites are prohibited.

In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Elsevier's archiving and manuscript policies are encouraged to visit:

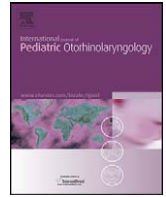
<http://www.elsevier.com/copyright>



Contents lists available at ScienceDirect

International Journal of Pediatric Otorhinolaryngology

journal homepage: www.elsevier.com/locate/ijporl



Orofacial and dental injuries associated with seizures in paediatric patients in Lagos University Teaching Hospital

W.L. Adeyemo^{a,*}, I.B. Fajolu^b, E.O. Temiye^b, M.O. Adeyemi^c, A.A. Adepoju^c

^a Department of Oral and Maxillofacial Surgery, Faculty of Dental Sciences, College of Medicine, University of Lagos, Lagos, Nigeria

^b Department of Paediatrics, Faculty of Clinical Sciences, College of Medicine, University of Lagos, Lagos, Nigeria

^c Department of Oral and Maxillofacial Surgery, Lagos University Teaching Hospital, Lagos, Nigeria

ARTICLE INFO

Article history:

Received 5 December 2010

Received in revised form 3 February 2011

Accepted 4 February 2011

Available online 3 March 2011

Keywords:

Orofacial

Dental injuries

Seizures

Paediatric patients

ABSTRACT

Objective: To determine the prevalence and pattern of presentation of orofacial and dental injuries in children with seizures at the Children's Emergency Unit of the Lagos University Teaching Hospital (LUTH), Lagos, Nigeria.

Methods: This was a prospective study of children with febrile or non-febrile convulsion who presented at the Children's Emergency Unit of LUTH between July 2008 and August 2009. The age, gender, type of convulsion and the presence/absence of orofacial and other bodily injuries were recorded in a proforma. Mechanism, type and classification of injury were recorded for patients with orofacial injuries.

Results: A total of 257 children (148 males and 109 females) with febrile/non-febrile convulsion were included in the analysis. The mean age (SD) of patients was 32.8 ± 40.5 months. There were 223 (86.8%) cases of febrile convulsion and 34 (13.3%) cases of non-febrile convulsion. Thirteen children sustained orofacial injuries giving a prevalence of 5.1%. There was no significant difference in the prevalence of orofacial injury between patients with febrile convulsion (4.5%) and those with non-febrile convulsion (8.8%) ($P = 0.282$). The most common cause of orofacial injuries was forceful insertion of hard object into the mouth during convulsive episodes. Twelve (92.3%) patients sustained soft tissue injury, while one sustained both soft and hard tissue injuries. The most common site of injury was the lip.

Conclusions: Oro-facial and dental injuries may occur in children with seizures. It is therefore important that these injuries be looked for by the paediatrician and the dentist/oral and maxillofacial surgeons should be involved in managing these children.

© 2011 Elsevier Ireland Ltd. All rights reserved.

1. Introduction

Seizures are a common neurologic disorder in children with a frequency of 4–6 cases/1000 children [1]. A seizure is a paroxysmal involuntary disturbance of brain function that may manifest as an impairment or loss of consciousness, abnormal motor activity, behavioral abnormalities, sensory disturbance or autonomic dysfunction. Seizures may occur during febrile illness or may also occur in the absence of fever [1].

Seizures are a major source of anxiety and fear for parents and caregivers who witness these episodes, and who most times think the child is dying [2]. However, home interventions that are usually given during this episode sometimes cause injury to these children. Traditional home remedies for febrile seizures in Nigeria reported by earlier studies include the use of native concoctions [3,4], burning of the feet [4–7] and forced insertion of hard objects

between the jaws to keep the jaws apart [7,8]. Forceful insertion of objects into the mouth may result in bruises and lacerations to the lips, tongue and mucosa, tooth avulsion, fracture and displacement [9,10]. Oro-facial injuries may also occur from falls or bites during the seizure. Earlier studies on orofacial injuries in children with seizures in Senegal [9] and Ile-Ife [10] reported a prevalence of 44.5% and 36% respectively. It has also been reported that most of these injuries are overlooked by paediatricians [9].

The aim of this study was to determine the prevalence and type of oro-facial injuries in children with seizures at the children emergency unit of the Lagos University Teaching Hospital, Lagos, Nigeria, with a view to calling the attention of paediatricians to the possibility of these injuries in children with seizure disorders.

2. Materials and methods

This was a prospective study of paediatric patients with febrile or non-febrile convulsion who presented at the Children's Emergency Unit of the Lagos University Teaching Hospital, Lagos, Nigeria between July 2008 and August 2009. The following information was recorded in the proforma designed for the study:

* Corresponding author. Tel.: +234 8023115885.

E-mail addresses: lanreadeyemo@yahoo.com, wadeyemo@unilag.edu.ng (W.L. Adeyemo).

Table 1
Characteristics of the patients.

	Frequency (%)
<i>Sex distribution</i>	
Male	148 (57.6)
Female	109 (42.4)
Total	257 (100)
<i>Type of convulsion</i>	
Febrile	223 (86.8)
Non-febrile	34 (13.2)
Total	257 (100)
<i>Orofacial injury</i>	
Yes	13 (5.1)
No	244 (94.9)
Total	257 (100)

age and gender of the patients, type of convulsion and the presence/absence of orofacial injury. In the presence of orofacial injuries, intraoral and extraoral examinations were carried out by a maxillofacial surgeon to ascertain the type and severity of injury. Mechanism and type of injury were recorded for patients with orofacial injuries: Injury to the soft and hard tissues (teeth, maxillary and mandibular bone) was ascertained and classified. The dentition was examined for fractures, mobility, avulsion or other evidence of injury. The presence/absence of other bodily injuries was also recorded.

3. Results

A total of 257 children with febrile/non-febrile convulsion were included in the analysis. There were 148 males and 109 females with a male-to-female-ratio of 1.4:1. The mean age (SD) of patients was 32.8 ± 40.5 months (range, 1–180 months). The majority (83.7%) of these patients were under the age of 5 years. There were 223 (86.8%) cases of febrile convulsion and 34 (13.3%) cases of non-febrile convulsion. Thirteen of the 257 children sustained orofacial injuries with a prevalence rate of 5.1%. There was no significant difference in the prevalence rate of orofacial injury between patients who presented with febrile convulsion (4.5%) and those with non-febrile convulsion (8.8%) ($P = 0.282$). Table 1 shows the characteristics of the patients.

The most common cause of orofacial injuries in these patients was forceful insertion of hard object into the mouth during convulsive episodes, which was recorded in all the 13 cases. Two of these patients also sustained injuries due to bite in addition to the insertion of hard object (Table 2). Twelve (92.3%) of these patients sustained soft tissue injury, while one patient sustained both soft and hard tissue injuries (avulsion of upper anterior tooth) (Table 2). The most common site of injury was the lip (57.1%), and soft tissue lacerations and abrasions were the types of injury sustained (Table 3).

Table 2
Mechanism of injury and type of injury sustained by the patients.

	Frequency
<i>Mechanism of injury</i>	
Forceful insertion of hard object into the mouth	13
Bite during convulsion	2 ^a
<i>Type of injury</i>	
Soft tissue injury	12 (92.3)
Soft and hard tissue injury	1 (7.7)
Total	13 (100)

^a Two patients sustained injury due to bite in addition to forceful insertion of hard object into the mouth.

Table 3
Site and type of soft tissue injuries.

	Frequency (%)
<i>Site of injury^a</i>	
Lip	12 (57.1)
Tongue	5 (23.8)
Cheek	4 (19.1)
Total	21 (100)
<i>Type of soft tissue injury^b</i>	
Laceration	7 (50)
Abrasion	7 (50)
Total ^c	14 (100)

^a Some patients had more than one injury.

^b One patient sustained both laceration and abrasion.

All the cases of soft injuries were conservatively managed, as none of them required suturing. No severe bleeding from lacerated tissue was recorded.

4. Discussion

The prevalence of oro-facial injuries in children with seizures in this study was 5.1% which is much lower than the 44.5% and 36% prevalence reported in Senegal [9] and Ile-Ife [10] studies respectively. One reason for the difference in prevalence rates in the 3 studies may be that majority of children (83.7%) in the present study were under five years and will either be edentulous or will have only primary dentition which are smaller than the permanent dentition and are less likely to cause injury to tongue and lips during seizure episodes, whereas in a study by Faye et al. [9] only children aged 5–15 years who were likely to have more permanent dentition were included. In addition, in another study from Ile-Ife, Nigeria by Ndukwe et al. [10], the higher prevalence rate may be a reflection of a small sample size of 75 patients. The difference may also be due to the levels of education and urban location of the present study. It is possible that more information on the appropriate care of a convulsing child is available to the parents/caregivers in our study.

Most oral injuries have been reported to be overlooked by paediatricians [9]. Ndukwe et al. [10] reported that many oral injuries were not recognised by examining paediatricians. Therefore, attention of paediatricians should be called to the possibility of these injuries in children with seizure disorders. In cases where orofacial injury is present or suspected, oral and maxillofacial surgeon should be consulted for comprehensive orofacial examination and possible management.

The most common cause of oro-facial injury in this study was the forceful insertion of hard objects into the mouth which is similar to an earlier report [10]. This could be explained by the general assumption in our environment that clenching of the jaws and unconsciousness are signs of seizures [11] which could ultimately lead to death. Therefore parents and caregivers always try to prevent clenching of the jaws by insertion of a hard object in the mouth. In an earlier study from Taiwan [12] 35% of parents tried to pry the convulsing child's clenched teeth apart by placing hard objects in the mouth. In another study in Turkey, 35.9% and 40.9% of parents whose children had first or subsequent convulsions respectively also placed hard objects in the child's mouth to try to keep the teeth apart [8].

Another study reported that most parents were at a loss at what to do when their children have seizures with 90.7% not carrying out any intervention before bringing the child to hospital and only 29.2% of parents were aware of corrective preventive measures [13]. The dangerous practice of insertion of hard objects into the mouth during seizure should be discouraged through public health educational campaign in the

community. Educational interventions have been shown to reduce harmful practices and improve recommended first aid interventions that parents give to children with seizures [12].

Soft tissue injuries, most especially the lip, were the commonest type of injury in this present study. This finding is similar to earlier report by Ndukwe et al. [10] in which lower lip and commissure were the most commonly affected site of injury. Faye et al. [9], on the other hand, reported tooth fracture as the most common injury in the group of children with seizures studied. The difference between the present study and that of Faye et al. [9] regarding the most common site of injury may be explained on the basis of different age group studied.

In the present study no mortality was recorded with orofacial injuries associated with seizure in this group of paediatric patients. A displaced or avulsed teeth in an unconscious patient could be aspirated and may result in pneumonitis or septicaemia or even death. Hence, it is important to investigate any missing tooth in an unconscious patient. On the long-term, displacement or avulsion of teeth in children may predispose to malocclusion. Lacerations may result in bleeding and significant blood loss and may require suturing. Mandibular fractures, temporomandibular joint dislocation and other injuries arising from falls are also known as features of seizure [14]; and should be checked for.

In the present study, no severe bleeding from lacerated tissues was recorded. All the soft injuries were conservatively managed, as none of them required suturing. Deep laceration in an unconscious patient may need to be sutured to avoid severe bleeding and possibility of aspiration pneumonia.

5. Conclusions

Orofacial injuries occurred in 5.1% of children with seizure disorders in the studied population. Oro-facial and dental injuries may occur in children who present with seizures, it is therefore important that these injuries be looked for by the paediatrician and the dentist/oral and maxillofacial surgeons should be involved in

managing these children. Parents and caregivers should also be educated on the dangers of forceful insertion of hard objects in the mouth, and other harmful traditional practices. They should also be educated on appropriate first aid measures to give to a child with seizures to avoid injury.

References

- [1] R.H.A. Haslam, Seizures in childhood, in: W.E. Nelson, R.E. Behrman, R.M. Kliegman, A.M. Arvin (Eds.), *Nelson Textbook of Pediatrics*, 15th ed., W.B. Saunders, Philadelphia, 1996, pp. 1686–1699.
- [2] J.H. Baumer, T.J. David, S.J. Valentine, J.E. Roberts, B.R. Hughes, Many parents think their child is dying when having a first febrile convulsion, *Dev. Med. Child Neurol.* 23 (1981) 462–464.
- [3] G. Afolabi, Cow urine poisoning, *Dokita* 6 (1964) 1–4.
- [4] I. Anochie, I.B. Graham-Douglas, Non-accidental injuries associated with convulsions in Port Harcourt, Nigeria. Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology, 2000; 1, No. 2 (July–December 2000), http://www.geradts.com/anil/ij/vol_001_no_002/paper009.html (published: 05.09.00, accessed 19.09.10).
- [5] O. Adejuyigbe, J.O. Folayan, Childhood burn injuries in Nigeria, *Nig. Med. Pract.* 22 (1991) 35–38.
- [6] F.A. Ofodile, J.O. Oluwasanmi, Burning the feet to treat convulsion, *Br. J. Plast. Surg.* 31 (1978) 316.
- [7] G.O. Okoji, J.E. Peterside, R.S. Oruamabo, Childhood convulsions: a hospital survey on traditional remedies, *Afr. J. Med. Med. Sci.* 22 (1993) 25–28.
- [8] E. Kayserili, A. Unalp, H. Apa, S. Asilsoy, M. Hizarcioglu, P. Gulez, H. Agin, Parental knowledge and practices regarding febrile convulsions in Turkish children, *Turk. J. Med. Sci.* 38 (2008) 343–350.
- [9] M. Faye, M. N'Diaye, M.C. Gueye Diagne, N.T. SarrNiang, A.A. Yam, Study of orofacial injuries during seizures in Senegalese children with epilepsy, *Odontostomatol. Trop.* 30 (120) (2007 Dec) 23–30.
- [10] K.C. Ndukwe, M.O. Folayan, V.I. Ugboko, J.B.E. Elusiyan, O.O. Laja, Orofacial injuries associated with prehospital management of febrile convulsion in Nigerian children, *Dental Trauma.* 23 (2007) 72–75.
- [11] E.E. Nwokocho, A.O. Awomoyi, Factors influencing mothers' role in convulsion treatment among under-five children in Ibadan, Nigeria, *World Health Popul.* 11 (2) (2009) 15–29.
- [12] M.-C. Huang, C.-C. Liu, Y.-C. Chi, K. Thomas, C.-C. Huang, Effect of educational intervention on changing parental practices for recurrent febrile convulsions in Taiwan, *Epilepsia* 43 (1) (2002) 81–86.
- [13] R.C. Parmar, D.R. Sahu, S.B. Bavdekar, Knowledge, attitude and practices of parents of children with febrile convulsion, *J. Postgr. Med.* 47 (1) (2001) 19–23.
- [14] C.E. Aragon, J.G. Burneo, J. Helamn, Occult maxillofacial trauma in epilepsy, *J. Contemp. Dent. Pract.* 4 (2001) 26–32.