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Orofacial injuries associated with prehospital management of febrile convulsion in Nigerian children

Ndukwe KC, Folayan MO, Ugboko VI, Elusiyan JBE, Laja OO. Orofacial injuries associated with prehospital management of febrile convulsion in Nigerian children. © Blackwell Munksgaard, 2006.

Abstract – The aim of this prospective study was to determine in a population of pediatric patients with febrile convulsions the prevalence and pattern of orofacial and dental injuries caused by traditional remedies used in a suburban Nigerian community. Over the study period of 28 months, 75 cases of febrile convulsion presented to the Children's Emergency unit of our hospital. Of these, 27 children (36%) sustained orofacial injuries caused by forceful insertion of a spoon into the mouth (96.3%) or a bite (3.7%) during convulsive episodes. The ages of the patients ranged from 12 to 84 months with a mean 39.8 ± 18.3 months. There were 15 males and 11 females with a male to female ratio of 1.4:1. The orofacial and dental injuries sustained from prehospital treatment at home were lacerations and bruising of soft tissues including lips, tongue, mucosa and commissures and tooth subluxation, displacement or avulsion. Other injuries sustained outside the mouth include second-degree burns to the feet, a chin laceration and facial bruises resulting from a fall. Many oral injuries were overlooked by pediatricians. Prompt recognition and appropriate management of febrile convulsion would be of great benefit to the pediatric patients.

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Febrile convulsion is a seizure that occurs in children up to 6 years of age (1). It is usually precipitated by fever arising from infection or inflammation outside the central nervous system in a child who is otherwise neurologically normal. It is the most common cause of convulsion in children under 5 years (2) with an estimated prevalence of 2–4% for children in this age group (3).

The duration of a febrile convulsion is usually short, lasting less than 3 min in 50% of cases. About 5% of cases have episodes exceeding 30 min (1). A recurrence is likely in 30% of patients (3, 4) and seizures may be simple (generalized tonic-clonic convulsions) or complex (prolonged or focal convulsions followed by delayed recovery of consciousness). Clinical examination usually reveals a source of infection.

Management includes identifying the cause of the fever and treating the fever to alleviate symptoms (4, 5) with agents as paracetamol or ibuprofen, and removal of excess clothing. Physical methods such as fanning, cold bathing and tepid sponging are controversial as they may cause discomfort and provide minimal benefit (5, 6). Prolonged seizures at home can be terminated with the use of rectal diazepam. Although this is rarely needed (most seizures are short lived), it is considered safe assuming mothers are properly educated in its use (5, 7).

Studies conducted in Nigeria have shown that parents, who are panic-stricken in the face of this disorder, resort to prehospital remedies ostensibly to save the life of the child. These measures, which range from forceful insertion of objects into the mouth to burning a child's feet, complicated this otherwise benign condition. Although a previous report (8) on convulsive disorders in adults highlighted the consequences of forceful insertion of hard objects into the mouth of convulsing patients, little is known about the effect in children.

The aim of this study was to prospectively study in a population of pediatric patients with febrile convulsion the prevalence and pattern of orofacial and dental injuries caused by traditional remedies used in suburban Nigerian community.

Materials and methods

All consecutive children with febrile convulsion who presented at the Children's Emergency Unit of the Obafemi Awolowo University Teaching Hospital, Ile–Ife, Nigeria from September 2002 to December 2004, were entered into the study. At presentation, the following information was obtained from the parents or relatives who accompanied the patient to the hospital: age, gender, occupation and level of education of the parents or other informant and first aid tools and methods administered at home. The child was subsequently examined both extra and intraorally for bruises, abrasions or lacerations. The intraoral examination was carried out using a sterile wooden spatula under natural lighting. The dentition was examined for fractures, mobility, avulsion or other evidence of injury. The types and frequency of injuries associated with using home remedies prior to patient's appearance at the hospital were recorded. In addition, injuries to other parts of the body were documented.

Results

Over the 28-month study period, 75 cases of febrile convulsion presented to the Children's Emergency Unit of our hospital. Twenty-seven of the 75 children (36%) sustained orofacial injuries caused by forceful insertion of a spoon in the mouth (96.3%) or a bite (3.7%) during a convulsive episode. The ages of these patients ranged from 12 to 84 months with a mean age of 39.8 ± 18.3 months. There were 15 males and 11 females with a male to female ratio of 1.4:1. Table 1 summarizes the orofacial and dental injuries sustained as a result of prehospital treatment received at home. Injuries included lacerations of the lower lips, commissures, mucosa, and tongue; bruising of the lips, tongue and commissures; and tooth subluxation, displacement or avulsion.

Table 1. Types and frequency of injuries associated with forceful use of a spoon between the jaws ($n = 26$)*

Injury type†	*n*	(%)
Lacerations		
Lower lip	10	(38.5%)
Upper lip	3	(11.5%)
Commissure	10	(38.5%)
Mucosa (labial, cheek, palatal)	5	(19.2%)
Tongue	2	(7.6%)
Tooth injuries		
Subluxation/displacement	3	(11.5%)
Avulsion	1	(3.8%)
Bruising		
Lips	10	(38.5%)
Tongue	2	(7.6%)
Commissures	7	(26.9%)

*26 of 35 (74%) children whose jaws were forced open with a spoon incurred injuries.
†Some patients had more than one injury.

Table 2. Forms of traditional home remedies used for the management of febrile convulsions

Remedies	*n* (75)
Insertion of an object between the jaws	
Spoon	35
Padded fingers	9
Drinking	
Herbal concoctions	6
Salt solutions	12
Burning the feet	3
Making of skin incisions on the body	1
Tepid sponging	7
Prayers	2

Domestic remedies used prior to hospital visits included forceful insertion of a spoon or padded fingers between the teeth and forced drinking of salt solutions or herbal concoctions (Table 2).

Other injuries sustained outside the mouth-included second-degree burns to the feet (three cases), a deep chin laceration (one case) and facial bruises (two cases) resulting from a fall. Three patients developed aspiration pneumonitis and one patient septicemia. None of the aspiration pneumonitis patients had any orofacial injury. No mortalities occurred during the study. Many oral injuries were not recognized by examining pediatricians. Exceptions were gross facial wounds and intra-oral bleeding. None of the cases were referred to the pediatric dental unit of the hospital for further management.

Discussion

The prevalence of febrile convulsion in developing countries is estimated to be about 5% (9). No study

has reported the prevalence of febrile convulsions in Nigeria, although various institutional reports put the range at 5–15.1% (9, 10). The prevalence of orofacial injuries among patients with febrile convulsion found in the present study is 36%.

Previous studies have identified the use of native concoctions (11), burning of the feet (12) and forced insertion of hard objects between the jaws (13) as traditional home remedies for febrile convulsion in Nigeria. These remedies are usually used as emergency measures by parents who view the disorder as imminently fatal unless drastic measures are taken to keep the jaws ajar. This view is held by mothers regardless of their educational status (14, 15).

Despite the long-term recognition that hard objects are used between the teeth of convulsing children in many cultures, no reports have focused on the consequences of this practice. The present study showed that 26(74%) of the 35 children whose jaws were forced open with a spoon during convulsion sustained orofacial or dental injuries ranging from simple laceration of the lip to tooth displacement or avulsion. Possible short-term sequelae of displaced or avulsed teeth in an unconscious patient include aspiration, aspiration pneumonitis or septicaemia. Although none of the three patients who developed aspiration pneumonitis in the present study had oral injuries, it is important for the examiner to note any missing tooth in the mouth of an unconscious patient and to order a chest X-ray to rule out the possibility of a tooth or tooth fragment being aspirated into the lungs. The long-term effect of displacement or avulsion of teeth in children is the predisposition to malocclusion. It is desirable that children with these injuries be referred to a pediatric dentist for further management after resolution of the febrile illness.

Tongue and lip biting are recognized complications of seizure-related disorders in adults. When they occur, especially tongue biting, excessive bleeding and swelling may occur and cause respiratory obstruction (16). Fortunately, children in younger age groups who are prone to febrile seizures are still edentulous or only have primary teeth. These teeth are smaller than their permanent successors and may have a limited capacity to cause injury to the tongue or lips during the vigorous jaw movements that invariably accompany seizures. In the present study, only one patient sustained a tongue bite and the ensuing bleeding was controlled by gentle digital pressure with sterile gauze.

Mandibular fractures, dislocation of the temporomandibular joints and other injuries arising from falls are known features of epileptic attacks (17). The one child in our study who sustained a deep laceration to the chin as a result of fall and suffered no further complications was promptly sutured.

It was observed in this study that pediatricians do not routinely diagnose many oral injuries during their care of patients with febrile convulsion. Although there were no mortalities in our study population, severe injury to the tongue caused by the use of spoon has led to death in eclamptic patients (8). Therefore, pediatricians practicing in developing countries where traditional remedies are used for the management of febrile convulsions need to be vigilant for these injuries and ensure that they are appropriately managed. For the long term, it is imperative that mothers, specifically, and the population in general, be educated on the appropriate management of febrile convulsions to reduce serious consequences.

In conclusion, inappropriate home management of febrile convulsion in children has significant oral health implications. The forceful entry of hard objects into the mouth to prevent a child from clenching the teeth can result in soft tissue and dental injuries. These oral complications have significant short and long-term implications for the oral and general health of the child. The prompt recognition and enlightened management of patients suffering febrile convulsions would be of great benefit to the pediatric patient.

References

1. Shinnar S, Pellock JM, Berg AT, O'Dell C, Driscoll SM, Maytal J, Moshe SH, Delorenzo RJ. Short-term outcomes of children with febrile status epilepticus. Epilepsia 2001;42:47–53.
2. Siddiqui TS. Febrile convulsion in children: relationship of family history to type of convulsions and age of presentation. J Ayub Med Coll Abbottabad 2002;14: 26–8.
3. Smith MC. Febrile seizures. Recognition and management. Drugs 1994;47:933–44.
4. Fukuyama Y, Seki T, Ohtsuka C, Miura H, Hara M. Practical guidelines for physicians in the management of febrile seizures. Brain Dev 1996;18:479–84.
5. Royal College of Physicians and the British Pediatric Association Guidelines for the management of convulsions with fever. Br Med J 1991;303:634–6.
6. Berg AT. Are febrile seizures provoked by a rapid rise in temperature? Am J Dis Child 1993;147:1101–3.
7. Purssell E. Physical treatment of fever. Arch Dis Child 2000;82:238–9.
8. Ndukwe KC, Ugboko VI, Ogunlola IO, Orji EO, Makinde ON. Orofacial injuries in Eclamptic Nigerians. Afr J Reprod Health 2004;8:147–51.
9. Familusi JB, Sinneti CH. Febrile convulsions in Ibadan Children. Afr J Med Sci 1971;2:135–49.
10. Osuntokun BO. Convulsive disorders in Nigerians: the febrile convulsions. (An evaluation of 155 Patients). East Afr Med J 1969;46:385–94.
11. Afolabi G. Cow urine poisoning. Dokita 1964;6:1–4.
12. Ofodile FA, Oluwasanmi JO. Burning the feet to treat convulsion. Br J Plast Surg 1978;31:316.
13. Okoji GO, Peterside JE, Oreanaboo RS. Childhood convulsions: a hospital survey on traditional remedies. Afr J Med Med Sci 1993;22:25–8.

14. Ofovwe GE, Ibadin OM, Ofovwe EC, Okolo AA. Home management of febrile convulsion in an African population: a comparison of urban and rural mothers' knowledge, attitude and practice. J Neurol Sci 2002;200:49–52.
15. Huang MC, Liu CC, Chi YC, Thomas K, Huang CC. Effect of educational intervention on changing parental practices for recurrent febrile convulsions in Taiwan. Epilepsia 2002;43:81–6.
16. Saah D, Braverman I, Elidan J, Nageris B. Traumatic macroglossia. Ann Otol Rhinol Larygol 1993;102:729–30.
17. Aragon CE, Burneo JG, Helman J. Occult maxillofacial Trauma in Epilepsy. J Contemp Dent Pract 2001;4:26–32.