



Oro-Dental and Maxillofacial Trauma in Epilepsy at a Tertiary Hospital in Lagos

Traumatismes oro-dentaire et maxillo-facial liés à l'épilepsie dans un hôpital tertiaire de Lagos

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ABSTRACT

BACKGROUND: Seizure-related injuries are common and are a major cause of morbidity in subjects with epilepsy.

OBJECTIVE: To determine the frequency and types of oro-facial injuries in epileptic patients attending a tertiary hospital.

METHODS: A structured questionnaire was used to obtain information about injuries to the oral and maxillofacial region in epileptic patients at the Neurology Clinic of the Lagos University Teaching Hospital over a period of two years. Information sought included patient's sociodemographics, type of seizure, self-management of seizures, and history of injuries during seizures.

RESULTS: Of the 138 epileptic patients seen, 87 (63.0%) reported the occurrence of oral and maxillofacial injuries. Mean age of these patients (29.6±12.1 years) was not significantly different from that of those who had no injuries (33.5±15.6 years). Prevalence of seizure-related injuries was not significantly different in males and females (50 [58.8%] vs 37 [71.2%]). Injuries were more likely in those who had convulsive seizures than in those who had non-convulsive seizures. Patients who had hard objects forced between their clenched teeth during seizure episodes were more likely to sustain injuries. Soft tissue injuries were more common than injuries to the facial bones and teeth. Of these, the tongue was the most commonly injured. Majority of those with soft tissue injuries did not receive treatment in hospital. Although fractures of the cheek and jaw bones were not so common, all such cases received surgical treatment in hospital.

CONCLUSION: A high proportion of epileptic patients in Lagos appear to suffer seizure-related oro-facial injuries.

Measures for the prevention and management of these injuries are needed to help reduce the morbidity caused by such injuries. *WAJM* 2011; 30(2): 114–117.

Keywords: Dental; Maxillofacial; Trauma; Epilepsy; Lagos.

RÉSUMÉ

CONTEXTE: les blessures liées aux crises sont fréquentes et représentent une cause majeure de morbidité chez les épileptiques.

OBJECTIF: Déterminer la fréquence et le type de blessures oro-faciales notées chez des patients épileptiques qui fréquentaient un hôpital tertiaire.

METHODES: Pendant deux ans un questionnaire structuré a été utilisé pour recenser des informations sur les blessures au niveau des régions buccale et maxillo-faciale au cours des crises chez des patients épileptiques suivis à la clinique de neurologique du centre hospitalier universitaire de Lagos. Les informations recueillies concernaient les données sociodémographiques des patients, le type des crises, l'auto-prise en charge des crises et l'histoire des blessures au cours des crises.

RÉSULTATS: Sur les 138 épileptiques recensés, 87 (soit 63,0 %) ont rapporté la survenue de blessures buccale et maxillo-faciale. L'âge moyen de ces patients (29,6 ± 12,1 ans) n'était pas significativement différente de celle de ceux qui n'avaient pas de blessures (33,5 ± 15,6 ans). La prévalence des blessures liées aux crises n'était pas significativement différente chez les mâles et les femelles (50 [58,8%] vs 37 [71,2%]). Les blessures étaient plus fréquentes en cas de crises convulsives que des crises non convulsives. L'introduction par force d'objets durs entre les dents du sujet pendant les crises augmentait davantage la probabilité de survenue des blessures. Les lésions des tissus mous étaient plus fréquentes que les lésions au niveau des os du visage ou des dents. Au niveau des tissus mous, la langue était la plus souvent touchée. La majorité des lésions de tissus mous n'ont pas été prises en charge à l'hôpital. Par contre les fractures moins fréquentes de l'os de la joue et de la mâchoire ont tous bénéficié d'un traitement chirurgical à l'hôpital.

CONCLUSIONS: Une proportion élevée de patients épileptiques à Lagos semblent souffrir de blessures oro-faciales liées aux crises. Pour réduire la morbidité liée à de telles blessures, des mesures sont nécessaires pour améliorer leur prévention et leur prise en charge. *WAJM* 2011; 30(2): 114–117.

Mots-Cles: Dentaire, Maxillo-faciale; Traumatisme, Epilepsie, Lagos.

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INTRODUCTION

Epilepsy is a relatively common disorder of the central nervous system world-wide. Fatal injuries occurring during seizure episodes have been documented as being one of the factors responsible for higher mortality in epileptics than in the general population.¹ However, data about frequency and pattern of non-fatal accidents and associated factors are not readily available in literature though such accidents are more common than fatal injuries.²

While any part of the human body can be injured during epileptic seizures, the head, face, oral and dental tissues are commonly affected.³ Injuries such as head trauma, facial burns and scalds, teeth and bone fractures, and soft tissue dental injuries, are seen in patients with seizure disorder. The reported key predictors of such injuries are the severity, frequency, and duration of the seizures.² We have recently observed an increase in the number of epileptic patients with dental and maxillofacial injuries in our hospital, a tertiary health-care institution in south-west Nigeria. It is because of this that we decided to conduct a study on the prevalence of these injuries in patients with epilepsy in our centre.

Moreover, while studies have been done on oral and dental needs of Nigerians with epilepsy,⁴ no studies, to our knowledge, have been done to document dental and maxillofacial injuries in these individuals. These injuries could be responsible for significant morbidity in individuals with epilepsy, including poor aesthetics, dental and oral infection, difficulty with mastication due to tongue and oral lacerations, and to malocclusion from jaw bone injuries.

SUBJECTS, MATERIALS, AND METHODS

This study was conducted at the Neurology Out-patient Clinic of the Lagos University Teaching Hospital between May 2006 and June 2008. The teaching hospital serves as a tertiary referral centre for the metropolis of Lagos and neighbouring areas, in the southwestern region of Nigeria. All patients who presented to the clinic with

a diagnosis of epilepsy during this period were included in the study. A standardised questionnaire was completed by the consulting doctor for each recruited patient. The questionnaire documented the socio-demographic data of the patients, and the type and frequency of seizures. Additionally, information about the practice of insertion of objects such as spoon, spatula and stick between the clenched teeth of epileptic patients during seizures by relations and other eye-witnesses, was obtained. Lastly, history of past or present injuries to teeth, and jaw bones and soft tissues of the maxillofacial region, and whether such injuries were treated in hospitals or dental clinics was documented.

Informed consent was obtained from the patients before the questionnaire was administered.

The questionnaires were analysed using the Statistical Package for Social Sciences (SPSS) version 18. Continuous variables are presented as means \pm SD while categorical variables are presented as proportions. Comparison of means was done by Student's t-test, while proportions were compared using Pearson's χ^2 test. Statistical significance was set at the level of P less than 0.05.

RESULTS

One hundred and thirty-eight consecutive patients with epilepsy seen during the study period and who gave informed consent were enrolled in the study. There were 85 (61.6%) males and 53 (38.4%) females. The ages of the patients ranged from 13 years to 67 years with a mean of 31.0 ± 13.6 years (male, 31.5 ± 14.3 years; female, 30.3 ± 12.5 years). Eighty-seven (63.0%) patients reported the occurrence of oral and maxillofacial injuries during seizures. These comprised 50 (57.4%) males and 37 (42.6%) females. Table 1 shows the distribution of these patients by age and sex. The mean age of patients who reported seizure-related injuries was 29.6 ± 12.1 years (range: 14–66 years) and that of patients who had never had seizure-related injuries was 33.5 ± 15.6 years (range: 13–67 years). The mean ages were not significantly different ($p=0.127$).

Prevalence of seizure-related oral

and maxillofacial injuries was not significantly different in males and females [50(58.8%) vs 37(71.2%)] ($p=0.193$). Injuries to soft tissues of the head and face constituted majority of those reported, occurring in 76 (87.4%) patients (Table 2). Of these, 19 had multiple injuries involving two oral and maxillofacial soft tissues, while nine had more than two soft tissue injuries. Injuries to the teeth occurred in 15 (17.2%) patients, eight of whom also had oral/maxillofacial soft tissue injuries.

The cheek and jaw bones were injured in seven (8.0%) patients, six of

Table 1: Distribution of Epileptic Patients with Dental and Maxillofacial Injuries by Age and Sex

Age group (in years)	Number (%)		
	Male	Female	Total
10 – 19	13 (14.9)	8 (9.2)	21 (24.1)
20 – 29	20 (23.0)	10 (11.5)	30 (34.5)
30 – 39	8 (9.2)	10 (11.5)	18 (20.7)
40 – 49	6 (7.0)	4 (4.6)	10 (11.6)
50 – 59	2 (2.3)	4 (4.6)	6 (6.9)
60 – 69	1 (1.1)	1 (1.1)	2 (2.2)
Total	50 (57.5)	37 (42.5)	87 (100.0)

Table 2: Frequency of Injuries to Soft and Hard Tissues of Oral and Maxillofacial Regions in 87 Epileptic Patients

Tissue injured*	No of Patients (%)
Oral/Maxillofacial Soft Tissues[†]	
Tongue	42 (48.3)
Lips	30 (34.5)
Forehead	20 (23.0)
Gums	13 (14.9)
Nose	1 (1.1%)
Teeth	
Incisors	11 (12.6)
Canines	4 (4.6)
Premolars	0 (0.0)
Molars	0 (0.0)
Cheek and Jaw Bones	
Cheek bones	4 (4.6)
Mandible	2 (2.3)
Maxilla	1 (1.1)

* More than one injured tissue (soft tissue/teeth/cheek/jaw) occurred in some patients.

[†]More than one oral/maxillofacial soft tissue was injured in some patients.

whom also had injuries to oral/maxillofacial soft tissues while two had teeth injuries in addition.

Nine (60%) of those with injuries to the teeth were treated in dental clinics. The rest received treatment at home. All the seven patients with cheek and jaw bone injuries had surgical treatment. Only 6 (9.0%) of those with soft tissue oral and facial injuries sought medical treatment in hospitals.

Forty-eight patients had had objects such as sticks or spoons forced between their clenched upper and lower teeth during seizure episodes. Of these, 43 (89.6%) reported injuries while of the 90 patients who had never had such interventions, 43 (47.8%) reported injuries. The difference is statistically significant ($p=0.001$)

Fifty-four (39.1%) patients reported that their relatives had been made aware of the danger of trying to force objects between the clenched teeth of a convulsing person, 58 (42.0%) said their relations had not been informed, and 26 (18.8%) were uncertain if such information had ever been made known to their relations.

Seizures were generalised tonic-clonic in 107 (77.5%) patients, complex partial in 27 (19.6%), simple partial (focal motor) in 3 (2.2%), and absence in 1 (0.7%).

Of the 110 patients who had convulsive seizures (generalized tonic-clonic and focal motor seizures), 80 (72.7%) had oro-dental and maxillofacial injuries during seizure episodes, while of the 28 patients who had non-convulsive seizures (complex partial and absence seizures), seven (25.0 %) had such injuries during seizure episodes. The difference is statistically significant ($p<0.001$)

Seizures were frequent (\geq once in three months) in 76 (55.1%) patients and infrequent ($<$ once in three months) in 62 (44.9%). Of those with frequent seizures, 47 (61.8%) reported seizure-related injuries, while of those with infrequent seizures, 40 (64.5%) had had seizure-related injuries. The difference is not statistically significant ($p=0.746$)

DISCUSSION

The prevalence of seizure-related

oro-dental and maxillofacial injuries in patients with epilepsy attending the neurology clinic of the Lagos University Teaching Hospital was 63.0%. Similarly high frequency of oro-dental injuries was reported by Faye, *et al*⁵ in Senegalese epileptic patients aged between 5 and 15 years. Of their 108 patients, 44.5% presented with soft tissue oral and dental injuries. Dental and orofacial injuries from seizure-related disorders are well-recognised.³ Injury to oral soft tissues, especially the tongue and lips, could arise from biting during vigorous jaw movements that accompany convulsive episodes or when these tissues are trapped between clenched jaws.

Unlike in the study by Faye, *et al* where the lips were the most commonly injured part, the tongue was mostly involved in our patients. In a study of orofacial injuries in eclamptic Nigerians (who suffered convulsive fits), Ndukwe *et al*⁶ reported that the tongue recorded the highest number of lacerations followed by the lips.

Injuries to the teeth occurred in 17.2% of our patients and involved the incisors and the canine. The anterior location in the mouth of these teeth makes them prone to injury and fracture. Ogunbodede *et al*⁴ found a much higher frequency of traumatic anterior dental injury in their study. In the series of 56 consecutive patients with epilepsy who had clinical dental examination done, 26 (46%) had traumatic anterior dental injury.

The least reported injuries in our study were fractures of the cheek (zygomatic complex) and jaw bones. Even though not common, there are several case reports of cheek and jaw bone injuries in epileptics in the literature.^{3,7,8} These injuries arise from direct effect of falls following sudden loss of consciousness.

The reported key predictors of seizure-related injuries are seizure type, seizure severity, and seizure frequency.² Most reports of injuries from seizures have been reported in patients with generalized seizures.^{9,10} In our study, patients who had convulsive seizures, especially generalized tonic-clonic seizures, were more likely to sustain dental and maxillofacial injuries than those

with non-convulsive seizures such as complex partial seizures. This supports earlier research, such as that of Nakken and Lossius,¹¹ that reported that tonic-clonic and atonic seizures were the seizure types most commonly resulting in injury. Our finding that frequency of seizures was not a significant factor in the occurrence of seizure-related oro-facial injuries was surprising but was however in concordance with that of Faye *et al*⁵ who reported no significant relationship between the number of seizures and the frequency of oro-dental injury in their patients with epilepsy.

A peculiar practice in our environment that may play a role in the occurrence of oral and facial injuries in our epileptic patients is the harmful practice of forcing objects such as metal spoons and sticks between the clenched upper and lower teeth of convulsing individuals in an attempt at preventing the two sets of teeth from coming together. The belief is that clenching of the teeth of a convulsing person leads to death. This practice is prevalent in our society. Ndukwe *et al*¹² in a study of children with febrile convulsions in Ile-Ife, another southwestern Nigerian town, reported that 36% sustained oro-facial injuries from the forceful insertion of metal spoon into the mouth during convulsion. Ogunbodede *et al* attributed the high prevalence of traumatic anterior dental injuries recorded in their study to this traditional practice. We found in our study that patients who had had such an 'intervention' were significantly more likely to sustain seizure-related oro-dental and facial injuries than those who had not.

Majority of our patients with seizure-related oro-dental and maxillofacial injuries did not receive treatment in hospital or dental clinics. It appears however that the severity of the injury determined whether patients sought medical attention in hospital. While less than 10% of the patients with soft tissue oral and facial injuries received treatment in hospital or dental clinics, all the patients who had jaw bone fractures had surgical treatment in hospital.

This study has highlighted the high frequency of oro-dental and maxillofacial injuries in our clinic population of

patients with epilepsy. Our findings lend support to previous research and contribute to our limited knowledge of seizure-related injuries. These injuries could cause significant morbidity including poor aesthetics and problems with mastication from malocclusion and tongue lacerations. Measures for the prevention and appropriate management of these injuries would need to be put in place to help reduce the morbidity caused by such injuries in our patients. In particular, additional injuries usually inflicted on patients with epilepsy from forceful insertion of unpadded objects between their teeth during seizures should be discouraged through public health campaigns in the community.

Conflict of Interest Statement

None of the authors has any conflict of interest to disclose

REFERENCES

1. Kirby S, Sadler RM. Injury and death as a result of seizures. *Epilepsia* 1995; **36**: 25–28.
2. Buck D, Baker G A, Jacoby A, Smith DF, Chadwick DW. Patients' experiences of injury as a result of epilepsy. *Epilepsia* 1997; **38**: 439–44.
3. Aragon CE, Burneo JG, Helman J. Occult maxillofacial trauma in epilepsy. *J Contemp Dent Pract* 2001; **2**: 26–32.
4. Ogunmodede EO, Adamolekun B, Akintomide AO. Oral health and dental treatment needs in Nigerian patients with epilepsy. *Epilepsia* 1998; **39**: 590–94.
5. Faye M, N'Diaye M, Gueye Diagne MC, SarrNieng NT, Yam AA. Study of oro-dental injuries during seizures in Senegalese children with epilepsy. *Odontostomatol Trop* 2007; **30**: 23–30.
6. Ndukwe KC, Ugboko VI, Ogunlola IO, Orji EO, Makinde ON. Orofacial injuries in eclamptic Nigerians. *Afr J Reprod Health* 2004; **8**: 147–151.
7. Goracy E, Stratigos GT. Successive mandibular fractures in the alcoholic-epileptic patient-report of a case. *Oral Surg Oral Med Oral Pathol* 1971; **32**: 701–707.
8. Zachariades N. Recurrent fractures of the mandible. *Oral Surg Oral Med Oral Pathol* 1985; **60**: 562–564.
9. Benbadis SR, Wolgamuth BR, Goren H, Brener S, Fouad-Tarazi F. Value of tongue biting in the diagnosis of seizures. *Arch Intern Med* 1995; **155**: 2346–49.
10. Thomas RH, Higgins S, Fuller GN. Dental injuries during seizures associated with juvenile myoclonic epilepsy. *J Neurol Neurosurg Psychiatry* 2009; **80**: 91–93.
11. Nakken KO, Lossius R. Seizure-related injuries in multihandicapped patients with therapy-resistant epilepsy. *Epilepsia* 1993; **34**: 836–840.
12. Ndukwe KC, Folayan MO, Ugboko VI, Elusiyan JB, Laja OO. Orofacial injuries associated with prehospital management of febrile convulsion in Nigerian children. *Dent Traumatol* 2007; **23**: 72–75.