

OBSTETRICS

Orofacial injuries associated with eclampsia in patients presenting at a Nigerian Tertiary Hospital

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A prospective study was conducted to determine the incidence and pattern of orofacial injuries among eclamptic patients at the Lagos State University Teaching Hospital between December 2008 and November 2009. The incidence of orofacial injuries was 42%. Most injuries were due to bite and forceful insertion of hard objects into the patient's mouth by relatives during convulsive episodes. The type of antenatal care received had an influence on the incidence of orofacial injuries and there was a correlation between the number of convulsions and orofacial injuries. The mortality rate from eclampsia was 20.6%, and presence of orofacial injuries was a risk factor for mortality. Obstetricians and other healthcare providers should be familiar with the ways of preventing these injuries and seek early maxillofacial consultation when they occur. There is need for community education on the dangers of forceful insertion of hard objects into the mouth of eclamptics during fits.

Keywords: Eclampsia, orofacial injury

Introduction

Pre-eclampsia and eclampsia continue to be among the leading causes of maternal death worldwide but particularly in developing countries. The condition is relatively rare in developed countries in comparison with the developed nations. This is due to the wider availability and utilisation of modern obstetric care services in the developed nations. The incidence in developed countries ranges between 1 in 2,000 deliveries and 1 in 3,704 deliveries (Douglas and Redman 1994; Lee et al. 2004), while that of developing countries vary widely from about 1 in 12 to 1 in 1,700 deliveries (Adam et al. 2009; Tukur and Muhammad 2010). There is an increased incidence of pre-eclampsia and eclampsia in lower socioeconomic populations, in women younger than 20 years, in multifetal gestations, and in those without access to prenatal care. Reports of orofacial complications/injuries associated with eclampsia during convulsive episodes are scanty in the literature. Saah et al. (1993) reported a case of macroglossia resulting from tongue biting during eclampsia, while Ndukwe et al. (2004) reviewed a series of orofacial injuries in eclamptic patients.

The aim of the present study was to determine the prevalence and pattern of presentation of orofacial injuries among eclamptic patients presenting at a tertiary health institution in Lagos, Nigeria, with a view to calling the attention of obstetricians and other health professionals to the possibility of these injuries in eclamptic patients.

Material and methods

This was a prospective study conducted at the Lagos State University Teaching Hospital over a period of 1 year (December 2008 and November 2009). A proforma was designed to collect the following data: age, parity, history of antenatal care, number of eclamptic fits, presence/absence of orofacial injuries and morbidity/mortality associated with eclampsia. The following information was also recorded in those with orofacial injuries: mechanism and type of injuries, history of a hard object being inserted into the mouth before admission, presence/absence of temporomandibular joint dislocation and complications of orofacial injuries.

Data was analysed using the SPSS for Windows (version 12.0; SPSS Inc, Chicago, IL) statistical software package. Descriptive statistics and test of significance (χ^2 and Student's *t*-tests) were used as appropriate. A *p* value ≤ 0.05 was considered statistically significant.

Results

A total of 107 patients presented with eclampsia during the period of the study. A total of 45 (42%) of these presented with orofacial injuries.

Of the 107 patients, 46 (43%) were primigravidae, 37 (34.7%) were Para 1–2, 17 (15.8%) were Para 3–4, while only 7 (6.5%) were Para 5–6. There was no significant difference in the age of eclamptics who had orofacial injuries and those who did not (*p* = 0.73).

The mean age (\pm SD) of the total population at presentation was 29.9 ± 6.7 years (range, 18–48 years). The mean age (\pm SD) of those with orofacial injuries (mean = 29.9 ± 6.8 years) was not significantly (*p* = 0.96) different from those without orofacial injuries (mean = 29.9 ± 6.7 years).

The mechanism of injury in most cases were forceful insertion of hard objects into the patient's mouth by relatives (*n* = 16) and bite during convulsive episodes (*n* = 16). In six patients, orofacial injuries were due to a fall (Table I). The injuries involved soft tissues in 41 patients (91%) and both hard and soft tissues in four patients (9%). The most common site of soft tissue injury was the tongue (*n* = 34), followed by the lip (*n* = 33) (Table II). Abrasion (68.5%) and laceration (27.8%) were the most common types of injuries sustained during the convulsive episodes. For hard tissue injury, only dental hard tissue was involved: tooth avulsion (*n* = 2) and tooth displacement (*n* = 2). No case of facial bone fracture and temporomandibular joint dislocation was seen.

Table I. Mechanisms of orofacial injury during epileptic episodes.

Mechanisms	Cases	
	<i>n</i>	(%)
Forceful insertion of hard objects	16	35.6
Bite	16	35.6
Falls	6	13.3
Forceful insertion of hard objects and bite	7	15.5
Total	45	100

Only two of the 107 patients were booked for antenatal care in our hospital. The remaining 105 (98%) were only referred when they had developed eclampsia. Table III shows the contribution of the type of antenatal care received by these referred patients to orofacial injuries. Patients who received antenatal care from informal health facilities (traditional birth attendants and churches) and those who had not received any form of antenatal care had a significantly higher incidence of orofacial injuries than those referred from private hospitals and primary health centres ($p = 0.000$).

Most (31.8%) of the patients had one eclamptic fit, and 26.2% of patients experienced more than three fits before presentation (Table IV). There was a correlation between the number of eclamptic fits and orofacial injuries ($R = 0.643$, $p = 0.000$). The incidence of orofacial injuries increased with the number of eclamptic fits (Table IV).

All cases of orofacial injuries were referred for oral and maxillofacial consultations and management. Lacerations were sutured using 3/0 black silk/nylon sutures. Figure 1 shows a 32-year-old woman with sutured laceration of the lateral margin of the tongue sustained during eclamptic fits.

Complications arising from eclampsia were seen in 60 (56%) patients and these are highlighted in Table V. Massive tongue oedema was seen in 12 patients with trauma to the tongue. Mortality rate was 20.6% ($n = 22$). Table VI shows the immediate cause of death. The primary cause of death was renal failure. Three (13.5%) of these patients had massive tongue oedema in association with renal failure ($n = 2$) and pulmonary oedema ($n = 1$).

Orofacial injuries were commoner in patients with eclampsia related complications than those without ($p = 0.000$). Risk factors associated with mortality were: three or more eclamptic fits (OR = 3.21, CI = 1.21; 8.5, $p = 0.016$); presence of complications (OR = 0.45, CI = 0.35; 0.57, $p = 0.000$); and presence of orofacial injuries (OR = 5.15, CI = 1.8; 14.57, $p = 0.001$).

Table II. Site and type of soft tissue injuries.

	Cases	
	<i>n</i>	(%)
Site of injuries		
Tongue	34	39.5
Lip	33	38.4
Cheek	17	19.8
Chin	2	2.3
Total*	86	100
Type of injuries		
Abrasion	37	68.5
Laceration	15	27.8
Facial bruises	2	3.7
Total†	54	100

*Some patients sustained injury to more than one site. †Some patients sustained more than one type of injury.

Table III. Relationship between type of antenatal care in referred patients and incidence of orofacial injuries.

Type of antenatal care	Orofacial injuries		Incidence
	Yes	No	
Private hospitals	2	16	0.11
Primary health centres	1	7	0.13
Nursing homes	2	8	0.20
Traditional birth attendants	16	15	0.53
Churches	9	20	0.55
None	13	5	0.72

$p = 0.000$.

Discussion

Both pre-eclampsia and eclampsia continue to account for significant maternal and perinatal morbidity and mortality and remain a challenge even to the most experienced obstetricians, especially in developing countries. This study highlights the high incidence of orofacial injuries and other complications associated with eclampsia in patients presenting at a Nigerian tertiary hospital.

The incidence of 42% of orofacial injuries in eclamptic patients in this study is quite high and shows that orofacial injuries are common complications in eclamptic patients. However, an incidence of 12.1% for orofacial injuries during the course of eclamptic fits was reported by Ndukwe et al. (2004) in their study. The difference in prevalence in the two studies might be due to the fact that the present study was a prospective study, while that of Ndukwe et al. (2004) was a retrospective review of cases, with the possibility of missing out cases due to the inherent problems associated with a retrospective study.

Orofacial injuries arising from seizure-related disorders are well reported in the literature (Aragon et al. 2001; Ndukwe et al. 2007). These injuries range from lacerations, bruises, and abrasion of perioral and intraoral soft tissues, as well as hard tissues of maxillofacial region (teeth and jaw bones). The orofacial tissues involved in the present study are not different from those previously reported (Saah et al. 1993; Aragon et al. 2001; Ndukwe et al. 2004). Orofacial injuries due to eclamptic fits may be due to a bite or falls during convulsive episodes. The soft tissues, especially the tongue and lips, could be traumatised from biting as a result of the vigorous jaw movement that usually accompanies convulsing episodes or from direct trauma from the teeth in the event of these tissues being trapped between the jaws when the patient falls down. In addition, trauma to the teeth and the jaws arise from direct effect of falls following sudden loss of consciousness.

Forceful insertion of hard objects by relatives during convulsive episodes is a mechanism of orofacial injury that has been reported as a common pre-hospital management of convulsion in our environment (Ndukwe et al. 2004, 2007), and was the mechanism of injury in a large proportion of the cases. It is possible that these objects are more likely to cause damage to the tissues

Table IV. Relationship between number of eclamptic fits and incidence of orofacial injuries.

Number of eclamptic fits	Orofacial injuries		Incidence
	Yes	No	
1	3	31	0.09
2	7	22	0.24
3	11	5	0.68
> 3	24	4	0.86

$p = 0.000$.



Figure 1. A 32-year-old woman with sutured laceration of the lateral margin of the tongue. The laceration was sustained during eclamptic fits prior to presentation to the clinic.

that are already swollen as a result of pre-eclampsia/eclampsia. It is believed in our environment that an individual must never be allowed to close the upper and lower teeth together during convulsing episodes, as this is seen to portend danger and increases the mortality rate associated with convulsion. Therefore, this dangerous practice should be discouraged through public health promotional campaign at antenatal clinics and in the community.

It is instructive to note that lack of proper antenatal care not only has an effect on the incidence of eclampsia, but also the frequency of orofacial injury in these eclamptic patients. There was a higher incidence of orofacial injuries in patients who were referred from traditional birth attendants, churches and those who had no record of antenatal care. The reason may be due to forceful insertion of hard objects by unskilled healthcare providers, relatives or lay men, as a first-line management of convulsions in these women. Also the incidence of orofacial injuries increased with the number of convulsive episodes. This underscores the importance of seizure control in the management of eclampsia. Unfortunately, magnesium sulphate is still not in widespread use in Nigeria even at tertiary levels of healthcare, despite its recommendation by the World Health Organization as the most effective, safe and low-cost drug for the treatment of severe pre-eclampsia and eclampsia (Ekele 2009).

The maternal mortality rate of 20.6% recorded in this study is considered high and may be connected with the high rate of complications. More than half (56%) of the patients had complications

Table V. Complications associated with eclampsia seen in 60 patients.

Complications	Frequency	
	<i>n</i>	(%)
Aspiration pneumonia	31	37.8
Renal failure	27	32.9
Massive tongue oedema	12	14.6
Abruptio placentae	4	4.9
Disseminated intravascular coagulopathy (DIC)	3	3.7
Cerebrovascular accident (CVA)	3	3.7
Postpartum haemorrhage	1	1.2
Pulmonary oedema	1	1.2
Total*	82	100

*Some patients had more than one complication.

Table VI. Immediate cause of death.

	Patients	
	<i>n</i>	(%)
Renal failure (RF)	7	31.5
Abruptio placentae (AP)	1	4.5
Disseminated intravascular coagulopathy (DIC)	1	4.5
MTE + Aspiration pneumonia (APn)	1	4.5
MTE + RF	2	9.0
APn + RF	3	13.5
APn + DIC	1	4.5
APn + Pulmonary oedema	1	4.5
RF + AP	1	4.5
RF + DIC	1	4.5
RF + Cerebrovascular accident (CVA)	1	4.5
APn + RF + AP	1	4.5
RF + AP + CVA	1	4.5
Total	22	100

MTE, massive tongue oedema.

associated with eclampsia, with aspiration pneumonia and renal failure being the most common. Renal failure and aspiration pneumonia are well-documented complications of eclampsia and are known to be major causes of mortality in these patients (Igberase and Ebeigbe 2006; Olatunji and Sule-Odu 2006). The presence of orofacial injuries was also associated with increased risk of mortality in this study. The occurrence of these injuries like lip or tongue lacerations may predispose the patient to acute, severe and uncontrollable haemorrhage that can contribute to renal failure, and massive tongue oedema that may cause aspiration pneumonia, especially in the unconscious state (Ndokwe et al. 2004). The resultant effect will be a worsened prognosis and possibly death. It is therefore important that these injuries are carefully searched for at presentation and when present, early request for appropriate maxillofacial consultation and management made where available. After management of these injuries and stabilisation of the patient, prompt delivery is recommended. The route of delivery will usually be determined by the cervical state and other obstetric factors. However, the patient with eclampsia is a significant challenge to the anaesthetist (Moodley et al. 2001) and the risk associated with anaesthesia may be further increased in the presence of orofacial injuries, especially when there is massive tongue oedema. It is therefore recommended that an experienced anaesthetist should be present during surgery for an eclamptic with orofacial injuries. Unfortunately, only the few teaching and specialist hospitals located mainly in the urban areas of the country can boast of these specialist services and the distance and problematic transport situation usually make referrals from rural centres to these centres cumbersome. This results in late arrival of the patients to the referral centres, ultimately leading to worsened prognosis.

It is therefore important that healthcare providers are conversant with ways of managing eclamptics to prevent orofacial injuries. The patients should undergo continuous intensive monitoring and should never be left alone. The guard rails should be up on the bed side to prevent falls and a padded tongue blade should be kept at the bed side and inserted between the patients teeth in case of new convulsions. The patient should be put on her left side and foams and secretions from the mouth should be sucked regularly to avoid aspiration.

Conclusion

Orofacial injuries from eclampsia are common in the studied environment with the majority of the injuries due to bite or

forceful insertion of hard objects into patients' mouth by relatives. Orofacial injuries are more likely to be associated with sub-optimal antenatal care and repeated convulsive episodes, and may be a risk factor for mortality. Obstetricians and other healthcare providers should be familiar with measures to prevent these injuries in the eclamptic patient and when such injuries are suspected, seek appropriate and early dental or maxillofacial consultations. Also, a community-based health education programme should be pursued to highlight the dangers inherent in forceful insertion of hard objects into the mouth of eclamptic patients during convulsive episodes.

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