‘Killer’ canines: the morbidity and mortality of ebino in northern Uganda

Robert Iriso1, Sandro Accorsi2, Stephen Akena1, Jackson Amone1, Massimo Fabiani1, Nicoletta Ferrarese1, Matthew Lukwiya1, Teresa Rosolen2 and Silvia Declich2

1 St. Mary’s Hospital Lacor, Gulu, Uganda
2 Laboratory of Epidemiology and Biostatistics, Istituto Superiore di Sanità, Rome, Italy

Summary

In northern Uganda, unerupted primary canine teeth are commonly extracted because they are believed to cause diarrhoea, vomiting, and fever. This practice, known as ebino, is performed under very crude conditions often using unclean tools. To evaluate the morbidity and mortality of complications related to ebino, we retrospectively analysed discharge records from the paediatric ward of Lacor Hospital, Gulu. In the period 1992–98, ebino-related complications, mainly sepsis and anaemia, were among the leading causes of admission (n = 740) and hospital death (n = 156, case fatality rate = 21.1%, proportional mortality rate = 3.3%). Discouraging the adoption of deeply rooted traditional practices that are potentially hazardous to health should be a public health priority in northern Uganda. This could be done by educating not only the general public, but also traditional healers and community and religious leaders, who could convey the knowledge to their people.

keywords ebino, hospital, Africa

correspondence Silvia Declich, Istituto Superiore di Sanità, Laboratorio di Epidemiologia e Biostatistica, Viale Regina Elena, 299, 00161 Roma, Italy. Fax: 39 6 4938 7292; E-mail: silvia@iss.it

Introduction

In Uganda and surrounding countries, unerupted primary canine teeth are commonly believed to cause diarrhoea, vomiting, fever, and any disease or symptom occurring in infants, and for many years traditional healers have adopted the practice of extracting canine tooth buds (referred to as ‘killer teeth’) to cure or prevent these conditions (Abdel-Wahab 1987; Stefanini 1987; Ahmed et al. 1994; Hassanali et al. 1995; Hodes 1997; Kirunda 1999). In northern Uganda, this practice, which is deeply rooted in the local culture, is known as ebino (literally, ‘false teeth’). Despite the fact that this practice is quite common in northern Uganda and surrounding regions, there are very few quantitative data on the frequency of complications related to ebino. Most of the studies conducted to date have focused on its prevalence and on the sociological and cultural factors influencing the belief in its efficacy (Pindborg 1969; Woodruff et al. 1983; Baba & Kay 1989; Welbury et al. 1993; Kikwilu & Hiza 1997), but its public health importance and its impact on infant health in Uganda are not well known.

The objective of our hospital-based study was to evaluate the morbidity and mortality of complications related to ebino.

Methods

This study was based on the retrospective analysis of hospital discharge records in the paediatric ward of St. Mary’s Hospital Lacor (referred to as ‘Lacor Hospital’) from 1992 to 1998. Lacor Hospital is a private, nonprofit teaching hospital located in Gulu District, northern Uganda. During the study period, the hospital had 446 beds (increasing to 457 in 1998) and a yearly average of over 15 000 admissions and 120 000 outpatient consultations (Lacor Hospital 1998 Annual Report, unpublished data). The catchment area of Lacor Hospital is mainly inhabited by Acholi peasants, and in the past decade has been heavily affected by civil conflict, leading to massive population displacement, socio-economic disruption and breakdowns in the health system. Moreover, Gulu is one of the Ugandan districts most affected by the AIDS epidemic, with high, though decreasing, HIV...
prevalence among antenatal attendees in Lacor Hospital (27.1% in 1993 and 12.8% in 1998) (Fabiani et al. 1999).

The hospital discharge records of children admitted for complications related to ebino were reviewed and entered into a computerized data-base. There was no change in admission policy or in the reporting system over the study period.

Data from the discharge records were used to calculate the morbidity of complications related to ebino by age and gender. The proportional mortality rate (PMR) and the case fatality rate (CFR) (i.e. the proportion of cases that are fatal during the hospital stay) were also calculated, with CFR being considered as an indicator of severity of outcome. Data on the underlying illness for which ebino was performed were also considered, as were data on the period that elapsed from performance of these procedures to hospital admission.

The data analysis was developed in the context of the project ‘Global Support to the National Plan for HIV/AIDS Control in Uganda’, co-funded by the Italian Ministry of Foreign Affairs and the Istituto Superiore di Sanità (the National Health Institute of Italy). Approval from the hospital’s ethical committee was obtained for the use of hospital data.

**Results**

Between 1992 and 1998, 40 564 children were admitted to the paediatric ward, accounting for approximately half of all hospital admissions. 740 children were admitted for complications related to ebino, at an average of 100 admissions per year (range: 73 in 1997 to 153 in 1994). Complications related to this practice were the 10th leading cause of admission to the paediatric ward and the 9th leading cause of death in the ward (n = 156 hospital deaths), with a PMR of 3.3% (Table 1). Among the 10 leading causes of admission to the paediatric ward, ebino was the third leading condition in terms of the severity of outcome (CFR = 21.1%) after meningitis and malnutrition. The high CFR was also a result of late admission to the hospital: the mean interval between the beginning of symptoms and hospital admission was 5.4 days (range: 4.7 in 1997 to 6.1 in 1994). Specifically, a rising trend in CFR occurred with increasing delay in admission: 16.7% if the delay in admission was < 5 days; 22% if 5–9 days; and 41.7% if > 9 days.

Malaria and gastro-enteritis were the most frequently reported causes of fever and diarrhoea, which are the most common reasons for performing ebino (malaria reported on 250 discharge records and gastro-enteritis on 141 records). The peaks in ebino-related hospital admissions corresponded to the peaks in the number of paediatric ward admissions for malaria and gastro-enteritis, and to that of peak rainfall, whereas there was apparently no relation between the incidence of ebino-related admissions and admissions for pneumonia (Figure 1).

The most frequently reported complications of ebino were septicaemia and severe anaemia. These were the most common reasons for hospital admission, although there were other infections occasionally, such as osteomyelitis, meningitis, and tetanus.

The modal age at which ebino was performed was 5 months, when gingival swelling is most evident and children are most likely to suffer their first attacks of malaria and gastro-enteritis (Figure 2). Similar percentages of males (48.8%) and females (51.2%) were subjected to ebino.

**Table 1** Number and percentage of total paediatric-ward admissions, number of deaths, PMR, and CFR, by reason for hospitalization, Lacor Hospital, Northern Uganda 1992–98

<table>
<thead>
<tr>
<th>Reason for hospitalization</th>
<th>Number of admissions</th>
<th>%</th>
<th>Number of deaths</th>
<th>PMR (%)</th>
<th>CFR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>16707</td>
<td>41.2</td>
<td>811</td>
<td>17.3</td>
<td>4.9</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>4106</td>
<td>10.1</td>
<td>955</td>
<td>20.4</td>
<td>23.3</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>3387</td>
<td>8.3</td>
<td>449</td>
<td>9.6</td>
<td>13.3</td>
</tr>
<tr>
<td>Measles</td>
<td>2897</td>
<td>7.1</td>
<td>466</td>
<td>9.9</td>
<td>16.1</td>
</tr>
<tr>
<td>Gastro-enteritis</td>
<td>1719</td>
<td>4.2</td>
<td>332</td>
<td>7.1</td>
<td>19.3</td>
</tr>
<tr>
<td>Septicaemia</td>
<td>1692</td>
<td>4.2</td>
<td>238</td>
<td>5.1</td>
<td>14.1</td>
</tr>
<tr>
<td>Meningitis</td>
<td>1020</td>
<td>2.5</td>
<td>264</td>
<td>5.6</td>
<td>25.9</td>
</tr>
<tr>
<td>URTI</td>
<td>850</td>
<td>2.1</td>
<td>60</td>
<td>1.3</td>
<td>7.1</td>
</tr>
<tr>
<td>Anaemia</td>
<td>786</td>
<td>1.9</td>
<td>164</td>
<td>3.5</td>
<td>20.9</td>
</tr>
<tr>
<td>Ebino</td>
<td>740</td>
<td>1.8</td>
<td>156</td>
<td>3.3</td>
<td>21.1</td>
</tr>
<tr>
<td>Other</td>
<td>6660</td>
<td>16.4</td>
<td>790</td>
<td>16.9</td>
<td>1.9</td>
</tr>
<tr>
<td>TOTAL</td>
<td>40564</td>
<td>100.0</td>
<td>4685</td>
<td>100</td>
<td>11.5</td>
</tr>
</tbody>
</table>

1PMR: Proportional Mortality Rate
2CFR: Case Fatality Rate
3URTI: Upper respiratory tract infection
Discussion

The complications related to ebino are severe and include general diseases such as severe infections (especially sepsis), haemorrhage and anaemia, leading to hospital death in more than one fifth of all infants admitted for ebino. Although not the focus of this study, dental abnormalities also occur, including hypoplasia of permanent successors and of the adjacent primary and permanent teeth, displacement of permanent teeth, midline shift of the extraction site, missing primary lateral incisors (probably accidentally extracted), and distal eruption of permanent lateral incisors, leaving their primary predecessors retained (Holan & Mamber 1994).

To understand the severity of these complications, it must be taken into account that ebino is generally performed by a local practitioner or an elderly woman, such as the child’s grandmother, without anaesthetic and under very crude conditions. The operator makes an incision at the gingival margin with a tool such as a sharpened bicycle spoke, a knife, rusty wire or a nail, and then digs out the unerupted deciduous canine tooth. The same unsterilized tool is often used on several infants, a practice which can have even more serious implications considering the high prevalence of HIV infection in Gulu District. After the operation, herbs or locally prepared medicinal powders can be rubbed into the wound. The risk of complications can also increase as a result of another, yet less common, traditional practice that is sometimes performed simultaneously with ebino. This practice, known as tea-tea, consists of making systematic incisions on the chest wall, usually in the mammary areas, when the child has difficulty in breathing due to acute respiratory tract infection, anaemia or severe malaria. The incisions, which vary in
depth, are made to remove ‘millet grains’, which are actually adipose tissue and are perceived to be the cause of the illness. In our study population, 112 of the 740 infants subjected to ebino had also undergone tea-tea, which must be taken into consideration when interpreting this study’s results.

The belief that unerupted primary canine teeth are the source of illness and death probably originates from the high incidence of malaria and other infectious diseases among teething infants, which is in part due to the poor nutritional and sanitary conditions in which the children are reared. This belief also leads to ebino being at times performed before any evidence of gingival swelling, apparently to prevent the problem from ever occurring or to treat febrile illness perceived to be caused by canines, prior to gingival swelling. The fact that this belief continues to be widespread and that there is a high frequency of ebino in northern Uganda could be related to the insecurity prevailing in the region in the past decade, leading to the isolation of rural communities, breakdowns in the health system, a decrease in health-education activities, and the strong reliance on traditional practices that constitute an essential part of the daily life, knowledge, attitudes and social identity of the population. Even parents belonging to privileged social and cultural classes still rely heavily on these harmful traditional practices and are convinced of the efficacy of the extraction of ‘killer’ canines.

To discourage this harmful practice, health education programs have been implemented in the hospital’s antenatal clinic and in rural communities, including videos and health-education sessions targeting the prevention of ebino. However, concerted efforts are still needed to dissuade parents from subjecting infants to this practice. The ultimate goal is to bring about changes in people’s attitudes and behaviour, in such a way that they themselves can distinguish among harmful, irrelevant, and useful practices in their daily lives and traditional beliefs. This could also be done by involving traditional healers and by educating community and religious leaders, who could convey the knowledge to their people.

In interpreting the results of this study, certain limitations must be taken into account. Firstly, hospital records are designed for patient care and not for research (Gordis 1996). In particular, the retrospective approach adopted could have led to an underestimation of the number of admissions for ebino, in that diagnoses may have been inaccurately reported on the discharge record or not reported at all. The quality of the data routinely collected on the hospital’s records varies greatly because physicians use different, and potentially non-comparable, diagnostic and reporting procedures. Despite these limitations, hospital discharge records are a convenient source of information on morbidity and mortality and are useful for health planning and epidemiological surveillance (Oleske 1995; Buehler 1998), and as a starting point for more detailed investigations. Another possible bias may have resulted from the fact that only children with severe or complicated diseases are admitted to Lacor Hospital, and thus the frequency of ebino and its complications may have been underestimated. In conclusion, preventable infections related to deeply rooted traditional practices such as ebino and tea-tea, have an important impact in northern Uganda and should thus be considered as a priority in infant public health.

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Incomplete success, or partial failure. Tropical Doctor 17, 132–134.
