

## PRE-HOSPITAL MANAGEMENT OF FEBRILE SEIZURES IN CHILDREN SEEN AT THE UNIVERSITY COLLEGE HOSPITAL, IBADAN, NIGERIA

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### ABSTRACT

**Background:** Febrile seizures are commonly encountered in emergency paediatric practice. Initial pre-hospital intervention given by caregivers has been shown to impact outcome.

**Objectives:** To describe the spectrum of pre-hospital interventions given for the treatment of childhood febrile seizures in Ibadan, Nigeria.

**Methods:** All consecutive cases of febrile seizures seen at the emergency room of University College Hospital, Ibadan over a period of 13 months were the subjects of the study. Details of history of illness including the interventions given before presentation were recorded. All the children had lumbar puncture and examination of their cerebrospinal fluid (CSF). All were followed up till discharge and the outcome was recorded.

**Results:** A total of 147 children, 83 males and 64 females with febrile seizures were studied. Harmful traditional practices were found to be common in the cohort studied. Fifty-nine (40.1%) of the children received at least one form of intervention believed to be capable of aborting the seizure during the attack at home. Herbal preparation was the most common form of pre-hospital treatment, given in 15 (10.2%) of the cases. Other forms of pre-hospital interventions given were application of substances to the eyes (6.1%), incisions on the body (2%) and burns inflicted on the feet and buttocks (1.4%). None of the children received rectal diazepam or buccal midazolam as home remedy for seizures. There was a statistically significant relationship between harmful cultural practices and the socio-economic class of the caregivers ( $P=0.008$ ).

**Conclusions:** Pre-hospital treatment of childhood seizures in Ibadan comprises mainly harmful traditional practices. There is a need for appropriate health education to reduce the morbidity and mortality associated with febrile seizures in the locality.

**Keywords:** seizures, febrile, cow's urine, socio-economic status

### INTRODUCTION

A febrile seizure refers to a seizure occurring in infancy or childhood usually between three months and five years of age as a result of elevated body temperature in the absence of pathology in the brain.<sup>1</sup> Febrile seizures are commonly encountered in emergency paediatric practice and have been described as the commonest cause of seizure in children under the age of five years.<sup>2,3</sup> Incidence has a wide variation amongst different population groups being as low as 2-4% in Caucasians and as high as 15.3% in Africa.<sup>2-7</sup> Common causes of febrile seizure in the tropics include malaria, pneumonia, urinary tract infection, septicemia and viral infections.<sup>2-9</sup>

Seizures cause intense parental anxiety.<sup>10</sup> This coupled with ignorance, is often responsible for the various forms of intervention offered by parents and caretakers when a child has an episode of seizure. These interventions include the administration of cow's urine concoction<sup>2,5</sup> and application of substances to the eyes and mouth such as palm oil, kerosene, eucalyptus oil etc.<sup>2</sup> Some make incisions on the body while others inflict burns injury on the child in an effort to rouse the unconscious child. In an earlier study about three decades ago, Familusi and Sinnette reported a high number of parents (52%) administering native concoction as home treatment for febrile seizures.<sup>2</sup>

Majority of parents have gross misconceptions about febrile convulsions and hence take inappropriate or even harmful actions in an attempt to control the convulsions.<sup>11</sup> It is believed that their social attitudes and behavior contribute immensely to the high morbidity and unfavorable prognosis of febrile seizures in the developing countries of the world.<sup>1,11</sup>

It has been reported that parents often have several misconceptions about febrile seizures.<sup>11,12</sup> It has also been suggested that the socioeconomic status of the parents/caregivers of children with febrile seizures and the maternal level of education affect the interventions given at home and this could in turn affect the outcome of febrile seizures.<sup>6,11</sup> Prior awareness of febrile seizures and the appropriate measures to be taken in a convulsing child were found to be significantly higher in the upper and middle social class.<sup>11</sup>

This study sought to describe the spectrum of interventions given at home by caregivers to control febrile seizures and the influence of socioeconomic status on the type of pre-hospital intervention given to affected children.

## MATERIALS AND METHODS

The study was carried out over a 13 month period at the Paediatric emergency ward in the University College Hospital, Ibadan, Nigeria. Ethical clearance was obtained from the University of Ibadan/University College Hospital ethical committee. Informed consent was obtained from the parents/caregivers of the children before they were recruited into the study.

All consecutive cases of fever (axillary temperature  $\geq 37.5^{\circ}\text{C}$ ) associated with seizures admitted were reviewed. Inclusion criteria included the following: age three months to five years, fever with seizures, no evidence of impaired consciousness following recovery from seizure attacks and a normal cerebrospinal fluid. Children with a febrile seizures, acute head injuries, congenital or acquired central nervous system abnormalities and those with abnormal cerebrospinal fluid were excluded from the study.

The past medical history, family and social history, detailed history of present illness including the type of pre-hospital intervention, type and duration of seizures were recorded. A thorough physical examination was performed on each patient at admission with emphasis on the central nervous system. Every child had a full blood count, lumbar puncture for cerebrospinal fluid (CSF) analysis, blood culture, urine microscopy, culture and sensitivity and blood film examination for malaria parasites done. Random blood sugar sample was taken before the lumbar puncture

and cerebrospinal fluid sugar was estimated. The socioeconomic classification was done using Oyedepi's method which considers the level of education and the occupation of both parents.<sup>13</sup> All were followed up daily until discharge from the hospital.

Data analysis was done using statistical package for social sciences (SPSS) version 16. Categorical data were compared using Chi-square test and Fisher's exact test where applicable. Differences were deemed to be statistically significant where  $p < 0.05$ .

## RESULTS

There were a total of 1,487 paediatric admissions into the emergency room during the study period. The prevalence of febrile seizures was 9.9%. One hundred and forty seven children satisfied the criteria for inclusion into the study. There were 83 boys and 64 girls, male to female ratio 1.3:1. Age ranged from 4 months to 60 months with a mean age (SD) of 26.4(13.8) months. (Table I)

Age (in months)	Male n(percent)	Female n(percent)	Total n(percent)
3 - 12	13(62.0)	8(38.0)	21(14.3)
13 - 24	35(56.5)	27(43.6)	62(42.2)
25 - 36	24(68.6)	9(25.7)	35(23.8)
37 - 48	12(66.7)	6(33.3)	18(12.3)
49 - 60	3 (27.3)	8(72.7)	11(7.5)
Total	83(56.5)	64(43.5)	147(100)

$$p = 0.305, df = 4, \chi^2 = 4.835$$

$$\text{mean age of females} = 27.19 \pm 14.4 \text{ months}$$

$$\text{mean age of males} = 25.71 \pm 13.24 \text{ months}$$

**Table I:** Age and Sex distribution of 147 children in the study

The type of seizures was classified into simple and complex febrile seizures taking into consideration the duration of seizures, pattern of seizures and the number of episodes within a period of 24 hours. Forty-seven (32%) had simple seizures while 100 (68%) had complex febrile seizures.

Forty (27.2%) parents were classified as upper class, 75 (51%) as middle class and 32 (21.8%) as lower class. There was no statistically significant difference in the type of seizure in relation to the socioeconomic class of the parents ( $p = 0.658, df = 2, \chi^2 = 0.838$ )

Type of intervention	Frequency	Percent
1. Agents given by mouth		
• Cow urine mixture	15	25.4
• Salt and water	8	13.6
• Milk	4	6.8
• olive oil	2	3.4
• Palm oil	1	1.7
• Pepper	1	1.7
2. Agents rubbed into eyes		
• onions	3	5.1
• metholatum	1	1.7
• carnel oil	1	1.7
• palm oil	1	1.7
• wine	1	1.7
• salt	1	1.7
3. Burns to parts of the body	2	3.4
4. Skin lacerations	3	5.1
5. Water to the body	8	13.6
6. Others	7	11.9
<b>Total</b>	<b>59</b>	<b>100.0</b>

others = kerosene, lime, coconut oil, eucalyptus oil and pepper

**Table 2:** Pre-hospital management of 59 children with febrile seizures

Fifty-nine children (40.1%) were given some form of pre-hospital treatment during or after the seizure (Table 2). Fifteen (25.4%) of the 59 received cow urine mixture while 9(15.3%) had substances applied to the eyes. One child subsequently had visual impairment due to corneal opacification. Two (3.3%) children had incisions inflicted on their skin while 3(5%) were subjected to burning of their buttocks and feet, one of them needed plastic surgery afterwards. None of the children was tepid sponged at the onset of the fever nor did any receive rectal diazepam or buccal midazolam to stop the seizure.

Table 3 shows that of the 59 parents/caregivers who gave any form of treatment at all to their children at home, 9(15%) were in the upper class, 36(61%) were in the middle class while 14 (23.7%) were in the lower class. Seventeen per cent of the upper class had pre-hospital intervention, 47% of the middle class and 44% of the lower class. There was a statistically significant difference between the types of pre-hospital intervention given in the different socioeconomic classes. ( $p= 0.008$ ). None of the children in the upper class had cow urine mixture.

There were two deaths giving a case fatality of 1.4%. The two deaths however occurred in the group of children who had not received pre-hospital intervention.

At the time of discharge persisting neurological deficits were seen in 6 of the 145 survivors. Four of them had generalized hypertonia while 2 children had 6th and 7th cranial nerve palsies. There was no statistically significant relationship between the occurrences of neurological deficits and the pre-hospital intervention given in these children.

Type of intervention	Upper	Middle	Lower	Total
Native concoction	0	7	8	15(10.2)
Other agents to drink	2	12	2	16(10.9)
B&C/S	2	10	1	13( 8.8)
Others	5	7	3	15(10.2)
No intervention	30	40	18	88(59.8)
<b>Total</b>	<b>39</b>	<b>76</b>	<b>32</b>	<b>147(100)</b>

$\chi^2 = 20.8$ ,  $p$  value =0.008,  $df = 8$ .

B&C/S = Burning and incisions made on the parts of the body or application of substances to the eyes

others = kerosene, lime, coconut oil, eucalyptus oil and pepper

**Table 3:** Pre-hospital intervention in relation to the socioeconomic class of the parents

## DISCUSSION

Febrile seizures are generally considered benign with a favourable outcome.<sup>14,15</sup> In our environment certain adverse factors combine to bring about poor outcome in terms of morbidity and mortality. Adverse consequences of harmful traditional pre-hospital treatment of febrile seizures include prolonged hospitalization, severe burns, aspiration pneumonia, corneal injuries and in severe cases, death.<sup>2</sup>

The administration of cow urine mixture to a convulsing child is a common practice associated with poor outcome. This was responsible for most of the deaths, which occurred, in the previous study at our centre.<sup>2</sup> The 10.2% prevalence of use of cow urine mixture found in the study is an improvement when compared with 52.4% in Familusi's study. The popular traditional medicine used to treat febrile seizures in the part of the world where this study was done is the cow urine mixture. This contains tobacco leaves, garlic leaves, basil leaves, lemon juice, rock salt, bulb of onions all soaked in cow urine or human urine in varying strengths and for varying lengths of time.<sup>16</sup> Oyebola<sup>17</sup> in his review of chemical components and pharmacological actions of cow urine mixture reported its deleterious effects on the brain and other body systems. These include: cardiovascular effects like tachycardia, blood pressure and electrocardiographic changes. Respiratory complications include: respiratory depression and respiratory failure while other effects are profound hypoglycemia, reduced neutrophil and monocyte counts (thus increasing the risk of infection), restlessness, spasms, intracranial haemorrhage, paraplegia, coma and death. The clinical findings in patients given cow's urine mixture are, on the whole compatible with nicotine poisoning and the occurrence of toxic symptoms in those who had the mixture rubbed into the skin supports the concept of nicotine poisoning because of the known ease with which nicotine is absorbed from the skin.<sup>18</sup> The above adverse effects were, however, not found in our study.

Less than three per cent of the children had burns or incisions as compared with 7.8% in Familusi's study. The number of prompt hospital attendance without initial pre-hospital intervention in the population studied (59.9%) did not vary significantly when compared with the 60% reported in Familusi's study. The low incidence of adverse neurological outcome and mortality when compared with the Familusi study at the same centre 30 years earlier, could be related to the less frequent use of native concoctions in the home management of the condition. There were only two deaths in this study; these children didn't have a history of native concoction use. The previous study in our centre which reported more deaths and long-term

neurological deficits had shown that these occurred among patients to whom traditional concoctions were administered for control of seizures. The differences in the use of traditional medicine and the outcome of such intervention observed between the two studies could be a reflection of the degree to which health education has been able to impact on the use of harmful measures by caregivers/parents when managing febrile seizures. Cow urine mixtures are popular remedies used in Nigeria for the treatment of febrile seizures.<sup>19</sup> This is shown by reports from other parts of the country.<sup>2,4,8</sup> Health education of the masses is the most important factor needed for people to stop the use of these concoctions. Mothers contribute a good target group for specific health education. Higher household income and education for mothers' doubles child survival.<sup>20</sup> Caregivers need to be enlightened on the dangers of persisting in such practices including, risk of infections, gangrene, neurological sequelae and even death.

## CONCLUSION

Childhood febrile seizures are common in emergency paediatric practice in Ibadan, Nigeria, with one in 10 children seen in the children's emergency ward presenting with a febrile seizure. Harmful traditional practices remain prevalent even in the 21st century. There is a need for public enlightenment and health education about febrile seizures. Appropriate home care for seizures, such as the use of rectal diazepam and buccal midazolam should be introduced and made freely available in paediatric practice in the country.

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