

# Closed Head Injuries in Children Following the Use of a Sarong Cradle

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## ABSTRACT

**Introduction:** Sarong cradles are unique to South-East Asian culture. Their use can lead to injuries from falls, over-enthusiastic rocking and defective equipment. We present 19 children who attended the Accident and Emergency (A&E) Department of a general hospital and who sustained injuries while in a sarong cradle. All had closed head injuries.

**Methods and Materials:** The data was collected over a 9-month period from September 1992 to May 1993. All patients with a documented history of fall following the use of a sarong cradle, were recruited into the study. The adults accompanying the patients were interviewed with a structured questionnaire. The information was recorded by the doctor in attendance.

**Results:** The ages of the 19 patients ranged from 13 days to 29 months. There were 17 Chinese, 1 Malay and 1 Indian. The types of closed head injuries included minor head injury with no external signs of injury, scalp lacerations, scalp haematomas and severe head injury with an extradural haematoma. The majority (14) were discharged from the A&E Department with head injury advice, 4 were admitted to the General Neurosurgical ward and one, to the Neurosurgical Intensive Care Unit. There were no fatalities in this group. The accidents happened while the children were either sleeping (14), playing (4) or feeding (1).

**Conclusions:** While most head injuries sustained in this manner are usually mild, there is a potential that such injuries may lead to more serious injuries. Care givers who use the sarong cradle should be aware of the dangers and exercise due care during use.

**Keywords:** sarong cradles, head injury, children, falls, haematoma

## INTRODUCTION

Head injury in children is a major cause of morbidity and mortality<sup>(1-4)</sup>. Most head injuries are minor without significant sequelae. However, children are extremely susceptible to the deleterious effects of neurological injury since the growing brain is protected by the thin and pliant skull which does not provide as much protection as the adult skull, in the event of a traumatic insult. Therefore it is important

to prevent the occurrence of such an insult whenever possible. Most times, children sustain injuries in the home or its immediate surroundings<sup>(1)</sup>. A frequent cause of accidental injuries is falls<sup>(5)</sup> and as reported by Rivara et al<sup>(2)</sup> the most common type of fall leading to hospitalisation was a fall from one level to another, such as from beds, tables, chairs etc. This paper reports on 19 incidences of closed head injuries following the use of a sarong cradle. This type of cradle is part of the Southeast Asian culture. The child is coaxed to sleep by placing him in the sarong (Fig 1). This piece of cloth is suspended by a spring to a ceiling anchor (Fig 2). This study illustrates the need to recognise that sarong cradles can cause injuries to children.

## MATERIALS AND METHODS

The data for this study were collected over a 9-month period from September 1992 to May 1993. All patients who were seen at the A&E Department with a documented history of injury following the use of a sarong cradle were recruited. There were 19 such cases and all the children sustained closed head injury. The adults who accompanied these children to the A&E Department were interviewed using a structured questionnaire, which allowed gathering of information on demographic factors and the circumstances surrounding the accident. The clinical presentation and disposition at the A&E Department were recorded by the doctor in-attendance. The clinical progress of the patients who were hospitalised was obtained from their hospital case records.

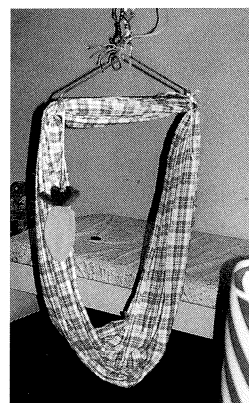


Fig 1 - The child is coaxed to sleep by placing him in the sarong

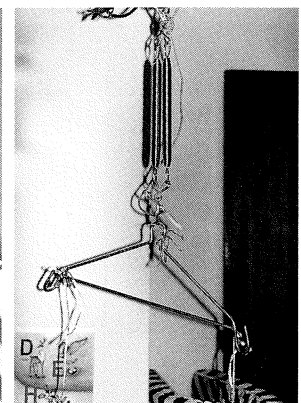


Fig 2 - The spring that suspends the sarong

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**Table I - Distribution according to sex and race**

Race	Male	Female	Total
Chinese	10	7	17
Malay	1	0	1
Indian	1	0	1
Total	12	7	19

**Table II - Clinical presentation of the children**

Clinical presentation	No. of children	Outcome
Well with no external injuries	9	discharged
Vomited but no external injuries	1	admitted
Sleepy but no external injuries	1	admitted
Contusion-face	1	admitted
Epistaxis	1	discharged
Extracranial haematoma with no other injuries	4	discharged (3) and admitted (1)
Extracranial haematoma with laceration	1	discharged
Occipital fracture with an extradural haematoma	1	admitted

## RESULTS

### Demographic factors

There were 12 males and 7 females. The age range was from 13 days to 29 months. There were 17 Chinese, 1 Malay and 1 Indian. The most seriously injured child was CSS, a 6-month-old Chinese male. Table 1 shows the patient distribution according to sex and race.

### Clinical presentation

For 15 of the children, the accident occurred between 8 am and 8 pm. Most (17) presented within 24 hours of the fall.

Nine were well and had no injuries. Another two had no external injuries, but one of them had vomited after the fall and the other was noted to be sleepy. Of the 8 who had injuries, one sustained contusion to the face, one presented with epistaxis which spontaneously ceased, five had extracranial haematomas and one was seriously injured with an extradural haematoma.

One of the children who had an extracranial haematoma, also sustained a laceration which required suturing (Table II).

CSS, the most seriously injured child, presented with progressive drowsiness and deteriorating neurological status. An urgent CT-scan revealed an occipital fracture with an extradural haematoma in the right occipital region.

When the injury occurred, 14 of the children were sleeping, four were playing and one was being fed. Two of the children who were sleeping fell because the spring of the sarong cradle had broken. Over-enthusiastic rocking by a young companion while

playing with him resulted in CSS being swung against an adjacent wall.

### Disposal

Five patients required admission; four to the neurosurgical general ward and one to the neurosurgical intensive care unit. The rest were discharged with head injury advice. All the four who were admitted to the general neurosurgical ward were discharged well after a one-to-two day stay in the hospital.

CSS, who was admitted to the neurosurgical ICU, was initially hospitalised for 13 days and treated conservatively. A repeat CT-scan was done on 24 May 1993, exactly 8 months after the accident. It showed a large periventricular cyst which communicated externally via the occipital fracture. A right ventriculo-peritoneal shunt was inserted on 31 May 1993. To date, CSS is well and has no obvious neurological sequelae.

### Investigations

Skull X-rays were ordered for nine of the children; five of whom had signs of injury, one was sleepy and three were well. The child who required suturing did not have any investigation carried out. As mentioned above, CT-scan was ordered for one of the children.

### Types of sarong cradle

Interestingly, although there are electronic sarong cradles in the market, all the children in this series fell from spring sarong cradles.

## DISCUSSION

During this study period, this A&E Department attended to 290 children with head injury between 13 days to 6 years of age. Among these were the 19 children (6.5%) who had sustained their injuries while using a sarong cradle.

A child who is put in a sarong cradle is prone to injuries from falls, over-enthusiastic rocking and defective equipment.

Although the sarong cradle is usually suspended only two to three feet from the floor, a child who is in one can fall off and sustain injuries (as shown by this series). Falls<sup>(2,6,7)</sup> are a bad cause of head injuries especially in younger children. Young children frequently fall and often from one level to another; some of these falls cannot be avoided as a few users of sarong cradles may argue. However, we agree with MacKellar et al<sup>(1)</sup>, that the effects of these falls can be reduced if they happened on a relatively non-hard surface. We would suggest that caregivers of children who use sarong cradles, to pay more attention to the area around these cradles and use a suitable protective material (eg mattresses) to minimise injuries.

Over-enthusiastic rocking can result in the child being pushed against an adjacent wall or falling off the cradle. This may occur as part of play, which was what happened to CSS. Therefore, adequate supervision by a responsible adult or older child is necessary.

This series showed that sarong cradles need to be checked to ensure that they are not defective. The cradle can also give rise to injuries if the sarong used is short, relative to the child's length. The child's head can slip out of it giving rise to possible neck sprains and head injury.

There is a need to educate the caregivers to be careful as injuries can occur and can give rise to morbidity. Although there was no mortality in our series, coroner records and the local newspapers<sup>(8)</sup> did report the death of a one-year-old child from closed head injury, after a fall from a sarong cradle.

Masters et al<sup>(9)</sup> in a landmark paper, recommended management strategy for radiographic imaging in patients with head trauma. They categorised head injury patients into 3 groups; low-risk, moderate-risk and high-risk. Children age less than 2 years who sustained head injury (unless injury is very trivial) were considered to have moderate risk. They stated that skull X-rays in this group may sometimes be appropriate. They and others recognise that children are different from adults<sup>(6,9)</sup>. The use of skull X-rays in the evaluation of head injuries has been debated over the last two decades. Although there are authors<sup>(10,11)</sup> who do not believe that any benefit can be gained from skull radiography, a few<sup>(8,12,13)</sup> have recommended that all infants who sustained skull trauma should undergo radiological evaluation. The risk of intracranial injury following head trauma is highest in this age group.

The brains of children between birth and 2 years of age are at their most vulnerable. The incidence of haematomas, tentorial and dural tears, shearing injuries and oedema are more common<sup>(14)</sup> and diastatic fractures are associated with leptomeningeal cysts and haemorrhagic venous infarcts.

We recommend that all children who sustained head injuries while in a sarong cradle be considered to be in the moderate risk group, as the majority are less than 2 years old and even if they were older, they would probably be 'small' to fit into a sarong cradle. As such, all cases of head injury should have skull X-rays.

One should exercise extra care when the mechanism of injury is due to a direct blow against a hard surface like an adjacent wall, as in the case of CSS.

We advocate strongly that the public be made aware of the dangers surrounding the use of sarong cradles; that its surroundings be made safe; that it should not be rocked from side-to-side and play with a child sleeping in it should be discouraged. When the sarong is in use, an appropriate sarong length should be chosen and the cradle checked for defects regularly.

## CONCLUSION

Head injuries sustained from using a sarong cradle are mostly minor and do not require any specific neurological intervention. However, there is a risk of severe head injury occurring. Caregivers of children who use sarong cradles must exercise due care and be aware of the potential danger these cradles pose to their charges.

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