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Case report

Non-accidental injury in children in Kuala Lumpur: An urban perspective

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ABSTRACT

Non-accidental deaths in children in Kuala Lumpur, Malaysia are not uncommon, and they are often reported for identification of injuries. Five case series in children are presented here with typical injuries of differing ages in child abuse. Where history was partially hidden from the real scenario, involvement of family members was inevitable. The injuries were particularly diversified from a single unprecedented injury to multiple severe injuries, which led to the deaths of children less than 3 years of age. The discussion revolved around the autopsy and ancillary investigations in the context of urban perspectives in Kuala Lumpur area.

1. Introduction

Non-accidental injury (*NAI*) is a result of a complex pathological interaction between the individual and its community.[1] It is a leading cause of childhood traumatic injury and death in the United States. It is estimated that 1400 children died from maltreatment in the United States in 2002, and 80% of these deaths are due to head injury.[2] It is essential to consider both child, family and society in each individual case and study the risk factors. Investigation of such cases should be maintained in children, particularly less than 2 years of age.[1] The perpetrator is often young parent with feelings of isolation and lack of support from the community.

The 'battered baby syndrome' or *NAI* occurs when a child suffers repeated physical injuries by adults, which exclude accident.[3] Inevitably, the child present to the hospital with an acute injury accompanied by evidence of both old and recent injuries, fractures and other injuries such as burns or bite marks.[4] There is a wide range of skeletal injuries in child abuse, which may be multiple. Other injuries may include chest, skull and long bone fractures, which tend to predominate.

The victims are mostly young children, whereby two thirds of them are less than 3 years of age. The majority of deaths are caused by beating, shaking, throwing and dropping.[3] Child homicide is a term used to describe classic *NAI*, which causes death, and convicted assailants are charged with life imprisonment or death. Some cases of battered children are noted for their spectrum of conditions from chronic injuries to only a single, isolated injury. This has brought to the attention of many forensic investigators, who are left with perplexed conditions as to whether they are well represented injuries, worthy of consideration. As a result, DiMaio & DiMaio (2001) had categorised these deaths into three major types that is, classical battered child, 'angry' homicide and 'gentle' homicide.[4] In 'angry' homicide, the child is presented with signs of acute injuries without any evidence of previous repetitive trauma.

Injuries involving head and abdomen are two very common causes of death in *NAI*. Head injuries such as subdural and subarachnoid haemorrhages are common with or without skull fractures, which are often associated with retinal haemorrhages. Nevertheless, other causes of haemorrhage including trauma at birth, bleeding disorders, sepsis, vasculopathies and cardiopulmonary resuscitation and metabolic abnormalities must be ruled out beforehand.

2. Case series

2.1. Case 1

One month old male infant was found unconscious on bed in the early morning. He was well and feeding for many days, when he was noted to be restless with a single episode of vomiting at

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night. He slept well throughout the night, only to be found unconscious in the morning. The antenatal history was unremarkable, except for a brief episode of jaundice. He was delivered at full term through spontaneous vaginal delivery at a private clinic. He went for his first dose of Hepatitis B vaccination at one month of age. There was no history of violence such as beating or shaking in the child from the family history.

During autopsy, the infant had a good body size with normal weight. There was no scalp injury (Fig. 1a). Grossly, the brain showed generalised cerebral oedema with subdural haemorrhage in the left cerebrum and posterior inter-hemispheric area (Fig. 1b). The subdural haematoma was partially organised with membrane formation and fibrosis. He died from intra-cranial haemorrhage from non-accidental injury.

2.2. Case 2

A 4-month old child, who was the only child in the family, was admitted for persistent crying and deteriorating consciousness while she was at the nursery. According to his parents, the child had no incidence of fall or any form of violence beforehand. In the hospital, a Ct scan showed extensive subdural and subarachnoid haemorrhage with generalised cerebral oedema. From ophthalmoscopy, the paediatrician found retinal haemorrhages in both eyes. There were no evidence of skin bruises to account for previous trauma, and he died one week later.

A patterned abrasion about 1.5 × 1 cm was found on the occipital area with an underlying subgaleal haematoma (Fig. 2a, b). Diastasis of sagittal suture was evidenced with subarachnoid and subdural haemorrhage on bilateral cerebral hemispheres (Fig. 2c). Blood clots were noted in the posterior cranial fossae bilaterally. The cause of death was intracranial haemorrhage due to non-accidental injury.

2.3. Case 3

A 3-year old girl was admitted for a sudden onset of seizures lasting about twenty minutes, while she was at home. She was cared by her mother's consort when the seizure commenced. Ct scan of the brain showed widespread left parieto-temporal subdural haemorrhage, generalised subarachnoid haemorrhage and cerebral oedema. Retinal haemorrhages in both eyes were present. She died after 6 days of admission to the hospital.

The conjunctivae were pale. There were several old injuries on both knees. Several abrasive-contusions were present on the right parietal and left temporal, chin, lower lip, mouth and right elbow (Fig. 3a). Fingertip contusions were found on both anterior and posterior aspects of right arm, postero-meidal aspect of left arm, medial left thigh and lower leg (Fig. 3b). Healed fingertip contusions on postero-medial aspect of right arm showed a yellowish hue. The age of injury was consistent with approximately 4–10 days of trauma infliction.

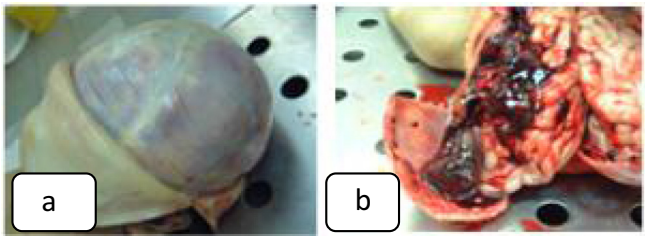

Fig. 1. (a) Photograph of head showing no scalp bruising. (b) Photograph of the brain with left subdural haemorrhage and membrane formation in subdural haematoma.

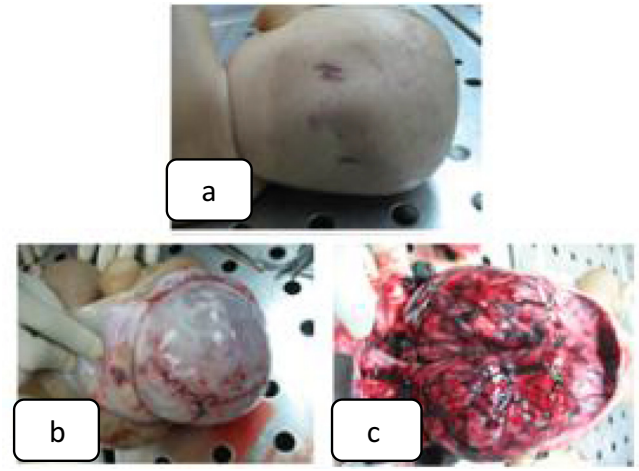

Fig. 2. (a) and (b) Photograph showing patterned abrasion at the back of the head with underlying subgaleal haematoma. (c) Photograph of the brain showing extensive subdural, subarachnoid haemorrhage and cerebral oedema.

A craniectomy of the left fronto-temporal area showed extrusion of cerebral tissue. The coronal, sagittal and left lambdoid sutures showed diastasis with surrounding haemorrhages. The entire left cerebrum showed subdural haematoma, which was consistent with a latent injury of about 4–10 days. The brain was oedematous, and partially liquefied with generalised subarachnoid haemorrhage (Fig. 3c). In the lungs, pulmonary oedema was present.

The retina in both eyes showed multiple folds and haemorrhages with large 'perimacular' retinal fold (Fig. 3d, e). Histology

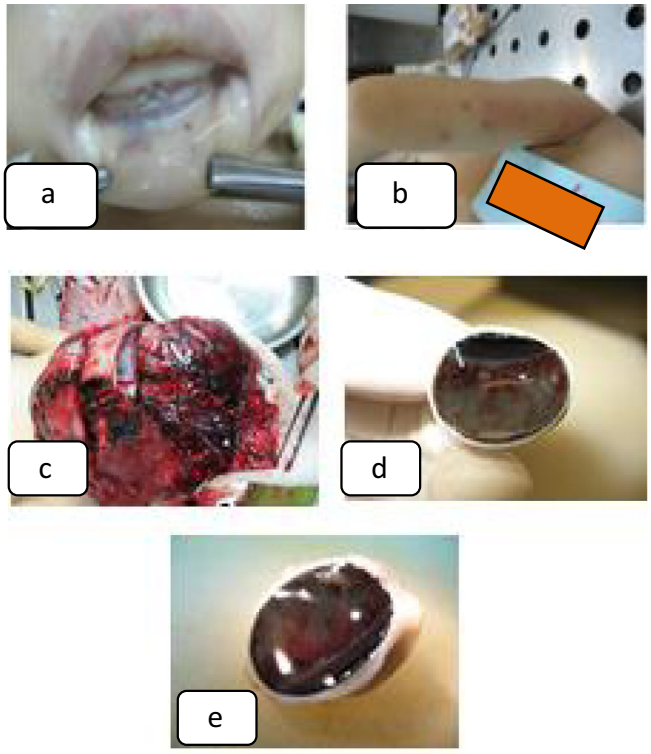

Fig. 3. (a) Photograph showing contusion and abrasion on inner lower lip. (b) Photograph showing multiple contusions on postero-medial arm consistent with fingertip contusions. (c) Photograph showing artifact contusions on left fronto-parietal scalp associated with craniotomy scar, generalised subarachnoid haemorrhage and subdural haemorrhage. (d) and (e) Photograph showing retinal haemorrhage in bilateral orbits.

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