

Child Abuse: Inflicted Traumatic Brain Injury

Shalu Gupta
Ashok Kumar

We report a one year old boy with clinical and neuroimaging findings of inflicted traumatic brain injury. The clinicians often overlook this form of physical abuse. The family structure also plays an important role in neglecting this form of problem.

Key words: *Child abuse, Inflicted brain injury.*

Inflicted traumatic brain injury (TBI) is the leading cause of death due to child abuse and is the most common cause of traumatic deaths in children less than 12 months of age(1). Despite its seriousness, the diagnosis seems to be missed frequently as a result of the non specificity of the child's presentation to the clinician. Up to 30% of cases of abusive head trauma may initially go unrecognized(2). Retinal hemorrhage and subdural hemorrhage (SDH) are thought to be the hallmark of abusive head trauma(1). The true incidence of intentional head injury in children remains uncertain, but a British survey reported an annual incidence of inflicted SDH to be 24.6 per 100,000 children under one year(3). Very few cases have been reported from India. We report a fatal case of inflicted TBI presenting as status epilepticus.

Case Report

A one-year-old previously healthy male child was brought in status epilepticus to the pediatrics emergency. There was no preceding history of any trauma. The child on arrival was pale, with

From the Department of Pediatrics, Institute of Medical Sciences, Banaras Hindu University, Varanasi (UP) 221 005, India.

Correspondence to: Shalu Gupta, Lecturer, Department of Pediatrics, Institute of Medical Sciences, Banaras Hindu University, Varanasi (UP) 221 005, India.

E-mail: drshalugupta@yahoo.co.in

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decerebrate posturing and was deeply comatose, with full anterior fontanel. The occipito-frontal circumference measured 46 cm. There was a right parietal scalp hematoma, with no other external marks of injury. Parents denied any history of trauma. Laboratory investigations demonstrated hemoglobin of 8 g/dL, normal serum electrolytes and normal coagulation tests. A computed tomography (CT) of head revealed a right parietal hematoma, underlying bone fracture, hemorrhagic contusion of parietal lobe and bilateral subdural effusion. Lumbar puncture revealed hemorrhagic cerebrospinal fluid. Ophthalmologic examination showed bilateral retinal hemorrhages. Remaining skeletal survey was normal. With supportive measures seizures were controlled, but the child expired 12 hr later because of massive aspiration. In view of unexplained scalp hematoma, underlying fracture of bone, cerebral hemorrhagic contusion with bilateral subdural effusions, and retinal hemorrhages, we considered the possibility of child abuse. This was a large joint family and there was family dispute over property. Parents did suspect some foul play, but were unable to pin point the accused. The family did not give consent for an autopsy.

Discussion

Differentiating children with inflicted and non-inflicted TBI can be challenging(4). If the diagnosis of child abuse is suspected, there are both clinical signs and historical clues that are more frequent among those with inflicted TBI. Nearly 45% of care givers of children with non-inflicted TBI seek care for their child after the injury before any clinical symptoms develop, whereas children with inflicted injuries present with either symptoms or unexplained injuries(5). In addition, children with non-inflicted injuries present with a very specific history of trauma, whereas majority of children with inflicted TBI present with no history of trauma(5). Similar observations were made by Hettler and Greenes(4), who found a specificity of 99% and a positive predictive value of 92% for inflicted head injury in children with head injury and no history of trauma. The main diagnostic clue is the presence of an injury with un-sustainable clinical history. Also almost 35% of children with inflicted injuries have no external signs of trauma such as bruising,

palpable fractures, or limb deformities, which might alert the clinician to a correct diagnosis(5). Although lack of external signs of trauma does not preclude impact injury, it suggests that in 35% of children shaking alone is the mechanism of injury(6).

Ophthalmic examination of children with suspected abuse is important for prognostic as well as diagnostic purposes. In inflicted injuries, retinal hemorrhages are likely to be multiple, bilateral, involve the pre-retinal and intra-retinal layers, cover the macula, and extend to the periphery of the retina(7). Those seen in children with accidental head trauma are most often unilateral, involved only the retinal layers, and in 42% of children were single(7). The finding of subdural hemorrhages on different sides or of apparently different densities or of generalized edema is strongly suggestive of inflicted TBI(8).

Children with inflicted TBI have been reported to have worse short and long term outcomes than children with non-inflicted TBI(9). Factors strongly related to poor outcome are young age, duration of unconsciousness, and low Glasgow coma scale(9). Clinicians need to be aware of the possibility of child abuse in any case of traumatic head injury without history of antecedent trauma.

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