Traumatic brain injury due to pressure cooker explosion in a child: case report

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Abstract: Traumatic brain injury is a common condition in the emergency services, affecting the pediatric and adult population significantly. Patterns of head injury as well as management principles in children are important differences compared to adults. Traumatic brain injury by Domestic pressure cooker is rare and has not been described in children, which to our knowledge is the first report in the literature of this nature.
Key words: Cranio-cerebral injury, pressure cooker, blast injury, traumatic brain injury

Introduction

Pressure cookers consist of a pressurized vessel that is widely used to cook food faster. Accidental malfunction of these vessels can be the cause of mild to severe injuries. Domestic pressure related injuries are less commonly reported in literature with sporadic case reports. (1-8) We report a rare case of a one year old child who sustained traumatic brain injury due to pressure cooker explosion and mechanism, pathophysiology and management of such injuries.

Case report

A 1 years old male child presented to the emergency room with the history of head trauma following an accidental blast of a pressure cooker. The child was unconscious since the time of injury and had multiple episodes of vomiting. The child was resuscitated in the emergency room and a neurosurgical consultation for head injury was asked. At the time of examination his Glasgow Coma Scale (GCS) was 9/15 (Eye opening none- E1, incomprehensible sounds-V3 and localizing to painful stimuli-M5). The child had paucity of movements of right side of grade 2/5. Pupils were bilateral equal and reacting to light. The pulse rate was 140 beats/minute and blood pressure was 110/70 mmHg. In view of low GCS the child was intubated and kept on elective ventilation. Local examination revealed an open wound over left parietal region without any underlying palpable fracture. Computerized tomography (CT scan) of the brain with bone window showed diffuse cerebral edema, subarachnoid hemorrhage and multiple skull fractures (Figure 1). His blood investigation including coagulation profile was normal. The child was managed conservatively in pediatric critical care unit. The child received tetanus prophylaxis, intravenous fluids, injectable antibiotics, antiepileptics, analgesics and sedations. The child made good recovery except right sided residual hemiparesis.

Discussion

Most of the accidental domestic pressure cooker related injuries related literature discuss ocular injuries (1, 4), burns (5, 7) or penetrating transorbital craniocerebral injuries (with mild traumatic brain injury). 6 Accidental pressure cooker explosion can be compared to any other blast injury (9, 10, 11) i.e. release of gases (steam), release of metal fragments (lid or nozzle) and release of hot contents (food material and liquid). The metal fragments can act like bullet and can cause injuries at the site of impact (4, 6) there may be a blast wave and hot gases and contents can cause extensive burns. (5) Management of a patient with pressure cooker related injuries follows the principal similar to a patient who had sustained injuries in blast and depends on the injuries sustained and is there any associated traumatic brain injury. The initial aim is to resuscitate the patient and maintain the airway and hemodynamic status. (6, 9) If there is an open wound with injuries to the underlying bony or neural structures the patient may need wound debridement and removal of devitalized brain tissue, removal of any foreign body, loose bone fragments followed by watertight closure of dura and closure of the wound. (9, 12) In present case the child did not require surgical and recovered well (except mild hemiparesis) with conservative management.

Conclusion

In summary, accidental domestic pressure explosion can result in serious and potentially life threatening injuries. Based on the available it is difficult to ascertain where there injuries are less common or have not been well addressed in literature. There is a need to recognize these injuries and promote safety measures to avoid such injuries. (1, 4, 5, 13)

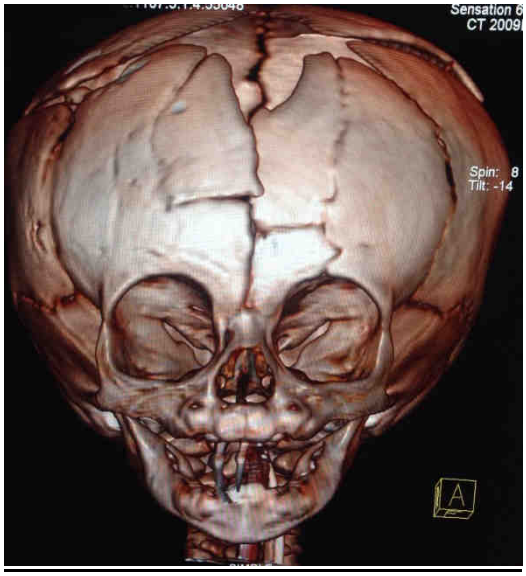

Figure 1 - Computerized tomography (CT scan) of the brain with bone window showed diffuse cerebral edema, subarachnoid hemorrhage and multiple skull fractures

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