

## Does localized ischemia of brain can occur after mild head injury in a child?

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### ABSTRACT

Generally cause of limb weakness post head injury is intracranial hematoma but in rare instances especially in pediatric population it has been found that limb weakness was due to intracerebral ischemia. We have also encountered a case of head injury of a one and half year old child presented with right sided weakness immediately after fall from bed. Relevant investigation has been done and his MRI brain was suggestive of left internal capsule infarct. After physiotherapy of weak limb for 2 weeks his limb weakness improved markedly and he became mobile independently. Purpose of the case reporting is again opening of the discussion regarding differentials in this type of presentation.

**Keywords:** stroke, Head injury, cerebral infarction.

### INTRODUCTION

Post-traumatic cerebral infarction in adult is one of the most severe secondary insults after traumatic cerebral injury with frequency ranging from 1.9% to 10.4%[1-3].stroke is one of the top ten causes of childhood death and the causes of childhood stroke are numerous. Head trauma is reported to be a possible cause of childhood stroke. While minor head injuries are very common occurrence in childhood but cerebral infarction is very rare sequelae. Head trauma usually causes hemorrhagic stroke. Recognition of childhood stroke is difficult and challenging. Annual average reported incidence in India is 13-33/100,000 per year[4].

**Case report:** we are presenting a case of one and half year old child who fell down from the bed while sleeping. He was conscious and there were no history of vomiting, seizure and bleeding from anywhere in the body. No recent history of viral infection. After few minutes his mother noticed that movement of his

right half of the body was less in comparison to the left. When she was trying to make him stand he was unable to stand independently and there was knee buckling while standing. He was brought to emergency where weakness of right half of the body was confirmed by treating pediatrician.MRI brain was done which was suggestive of left internal capsule infarct (Fig 1).

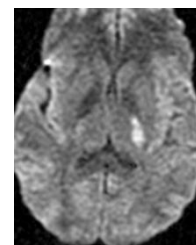


Fig 1: DWI MRI Brain showing restricted diffusion in left posterior limb of internal capsule

Investigations included routine blood, bleeding and coagulation profile, peripheral smear, test for sickle cell disease, arterial blood gases, serum lactate, X-ray chest, echocardiography, electrocardiography, electroencephalography, antinuclear antibodies, antiphospholipid antibodies, blood homocystiene. All investigations were normal. MRA was also normal. After physiotherapy of weak limb for 2 weeks his limb weakness improved markedly and he became mobile independently.

**Discussion:** Cranial trauma in young children can cause ischemic infarct[5-8]. This is an unusual mechanism of childhood stroke and should be considered after systematic exclusion of other causes. The pathophysiology of stroke after mild head injury in young children is either thrombus or spasm of lenticulostriate branches of middle cerebral artery. These vessels are end arteries and after originating from the main trunk at an acute angle (more acute in young), follow a recurrent course before penetrating the anterior perforated substance. There is, therefore a redundant extra cerebral segment. Any motion of the brain may lead to disruption of the arteries between the mobile extra cerebral segment and the fixed intra cerebral portion. This may lead to mechanical disruption of distal blood supply or intimal trauma and subsequent thrombosis or spasm [9, 10]. Relative delay of symptoms in most of cases can be explained on the basis of thrombus generation and immediate onset probably because of mechanical disruption of blood or spasm.

**Conclusion:** In pediatric population intracranial hematoma is not only the cause of limb weakness after mild head injury, although rare but ischemia due to spasm or intimal trauma of lenticulostriate branch of middle cerebral artery is another possibility.

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