Hypoxic-ischemic encephalopathy

Hypoxic-ischemic encephalopathy (HIE), is one of the most frequent and dramatic urgency found in neurological brain diseases of adults. This is a neuro-vascular and neuro-metabolic syndrome, caused by a shortage of supply of oxygen and glucose or their metabolism in the brain. HIE results from a global hypoperfusion or oxygenation deficiency rather than from infarction in a specific vascular cerebral territory.

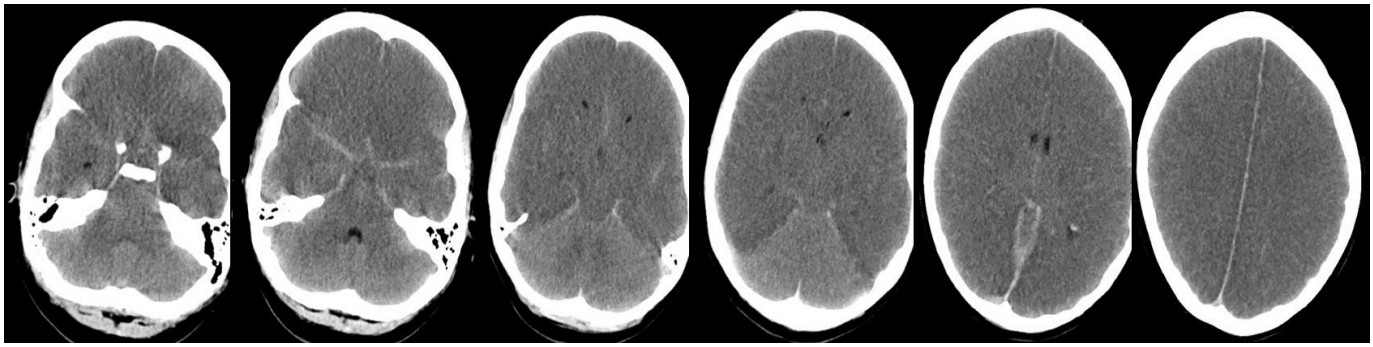
In adults, common etiologies include hypotension, cardiac arrest followed by succesful resuscitation, and carbon monoxide poisoning. The prognosis is favorable with recovery in case of mild or moderate hypoxia of short duration. Prognosis is unfavorable in hypoxic-ischaemic encephalopathy after severe damage. (1)

Findings on CT Scan

1. **Diffuse edema with effacement of the CSF-containing spaces**
2. **Decreased cortical grey matter attenuation with a loss of normal grey-white differentiation**
3. **Decreased bilateral basal ganglia attenuation**
4. **Reversal sign**: reversal of the normal CT attenuation of grey and white matter, demonstrated within the first 24 hours in a small number of these patients
5. **White cerebellum sign**: diffuse edema and hypoattenuation of the cerebral hemispheres with sparing of the cerebellum and brainstem, resulting in apparent

high attenuation of the cerebellum and brainstem relative to the cerebral hemispheres

6. **Pseudosubarachnoid hemorrhage**: cerebral edema and a resultant decrease in parenchymal attenuation and swelling and engorgement and dilatation of the superficial venous structures due to an increased intracranial pressure result in the subarachnoid space appearing filled with blood that appears hyperdense. (2)



20 years old female. GCS: 3

Global hypoxic ischemic barin injury

Both the **reversal sign** and the **white cerebellum sign** indicate severe injury and a poor neurologic outcome (2)

References:

1. Vintila I, Roman-Filip CO, Rociu C. Hypoxic-ischemic encephalopathy in adult. Acta Medica Transilvanica. 2010;2(3):189-92.

2. https://radiopaedia.org/articles/hypoxic-ischaemic-encephalopathy-adults-and-children