Magnetic Resonance Imaging Features of Neuroglycopenia

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Fig. 1: DW image shows hyperintensities in both hippocampi

Fig. 2: DW image shows hyperintensities in periventricular white matter

Fig. 3: DW image shows hyperintensities in basal ganglia

A 53 year old gentleman, chronic alcoholic, consumed his regular anti diabetic medication including insulin. But he skipped his meals and went to sleep. In the evening he was found unresponsive and was brought to hospital. At admission he was unconscious not responding to painful stimuli. His vitals were stable. He was afebrile, there was no pupillary asymmetry, there were no lateralising signs, neck was supple.

His blood sugar was 25 mg/dl. Other biochemical investigations including complete blood picture, renal and liver function tests were normal. He was given intravenous thiamine (100) mg and 25% dextrose intravenously. But did not improve. His MR imaging of brain shows hyperintense signals in basal ganglia, hippocampi and splenium of corpus callosum (Figure 1, 2 and 3).

Hypoglycemia is more common in diabetic patients and can occur as a complication of therapy with insulin or long-acting sulfonylurea drugs. Severe hypoglycemia may present with altered mental state or coma.¹ Loss of cellular homeostasis due to energy failure is thought be responsible for hypoglycemia-induced brain damage. Aspartate has been shown to cause neuronal necrosis in the cerebral cortex, neostriatum, and hippocampus.² White matter involvement, mainly affecting the centrum semiovale, corona radiata, internal capsule, and splenium of the corpus callosum is also reported.³⁴

Our patient showed involvement of basal ganglia, hippocampi, splenium and white matter Thalamus,brainstem and cerebellum are generally not involved. Sparing of thalamus differentiates hypoglycemia from ischemia But cerebellar ataxia due to hypoglycemia is reported.⁵

References

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