

MAGNETIC RESONANCE IMAGING IN HYPOGLYCEMIC COMA

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Hypoglycemia has been reported to cause changes on Diffusion Weighted Magnetic Resonance (DWI) images. (1-4) DWI imaging changes of hypoglycemic-induced lesions have been reported to involve the cortex, internal capsule, hippocampus, and basal ganglia (1-4). To our knowledge isolated bilateral pyramidal tract involvement on neuroimaging in hypoglycemia has never been reported although bilateral cerebellar peduncular and pyramidal tract involvement on DWI has been reported once before (4).

A 49-year-old man with diabetes mellitus was transferred to the hospital with a 24-hour history of unresponsiveness. His girlfriend reported inability to wake him up in the afternoon when she noted that he had overslept from the night before. His blood sugar in the field was 40 mg/dL; it was measured at 100 mg/dL after 50mL of 50% dextrose. Naloxone IV was also given with no improvement. Medical history included hypertension, coronary artery disease and congestive heart failure status post bypass graft, history of IV substance abuse and chronic renal insufficiency. On neurological examination, he was unresponsive to verbal stimuli and didn't show any purposeful activity or verbal output. Muscle tone was increased on all

extremities and withdrawal to pain was noted to be less vigorous on the left than the right side. Babinski sign was present bilaterally. Complete blood count was normal other than mild leukocytosis. Serum sodium was 132 nmol/L, potassium was 5.9 mmol/L, and creatinine was 1.8 mg/dL. Urine drug screen was positive for amphetamines. Electrencephalography was unremarkable. A CT scan of the head was unremarkable. Neuroimaging on day 3 showed increased signal on DWI of the posterior internal capsules extending down into the cerebral peduncles and into the upper pons with decreased signal on apparent diffusion coefficient map (ADC). MRA of the circle of Willis showed a very small left posterior communicating artery but was otherwise normal.

The importance of concomitant use of amphetamines to the DWI changes in this patient is unknown. Catecholamine excess from amphetamine abuse may have acted in concert with hypoglycemia to cause diffusion restriction. As noted by Cordonnier et al (3), hypoglycemia leads to a reduction in cell membrane ionic pump activity and this process may have been worsened by vasoconstriction and ischemia from amphetamine excess in the current case.

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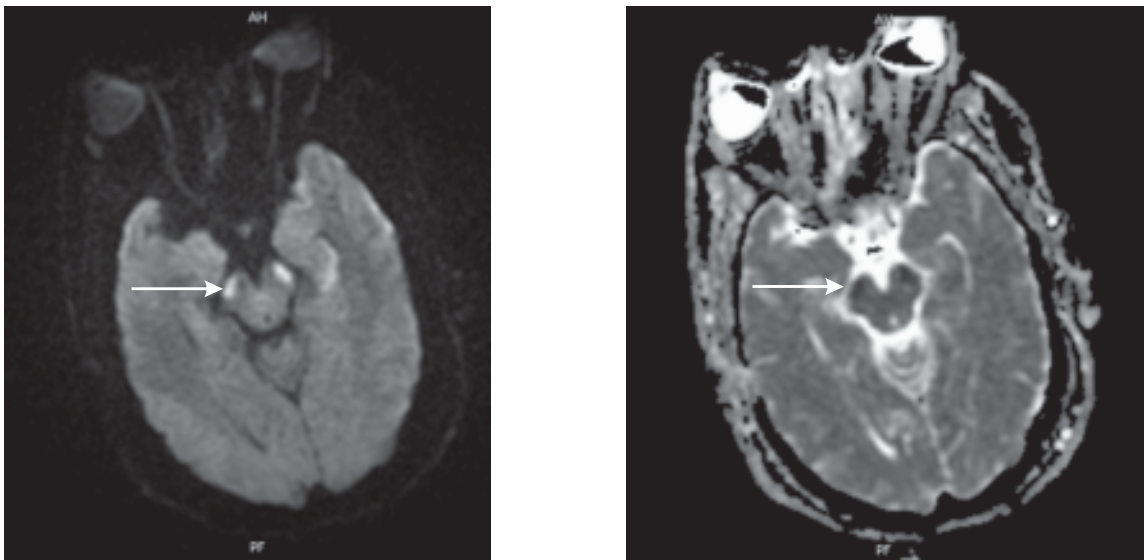


Figure. Diffusion weighted MRI (DWI) (top figure) showed increased signal in the corticospinal tracts in the internal capsule and cerebral peduncles bilaterally (arrow). Apparent diffusion coefficient maps (ADC) (bottom figure) showed a corresponding decreased signal (arrow).

REFERENCES

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