MRI of toxic leukoencephalopathy syndrome associated with methylenedioxymethamphetamine

Figure MRI of MDMA-induced leukoencephalopathy

Axial fluid-attenuated inversion recovery images show diffuse hyperintensity predominantly involving the midbrain, insulae, and basal ganglia bilaterally.

A 17-year-old boy presented with headaches, altered mental status, and double vision 2 days after ingestion of "molly" pills (methylenedioxymethamphetamine [MDMA], ecstasy), which was detected on urine toxicology. Lumbar puncture yielded CSF with mild lymphocytosis and elevated protein. Rheumatologic, infectious, and other toxicologic workup had negative results. MRI of the brain showed diffuse signal abnormality in the midbrain, bilateral insulae, and basal ganglia bilaterally (figure). Leukoencephalopathy related to MDMA use is uncommon and believed to result from serotonergic neuronal damage and myelin damage from oxidative stress. Individual susceptibility may be related to abnormalities in the demethylation of debrisoquine hydroxylase.

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