Teaching NeuroImages: Neuroimaging Findings in Inosine Triphosphate Pyrophosphohydrolase Deficiency

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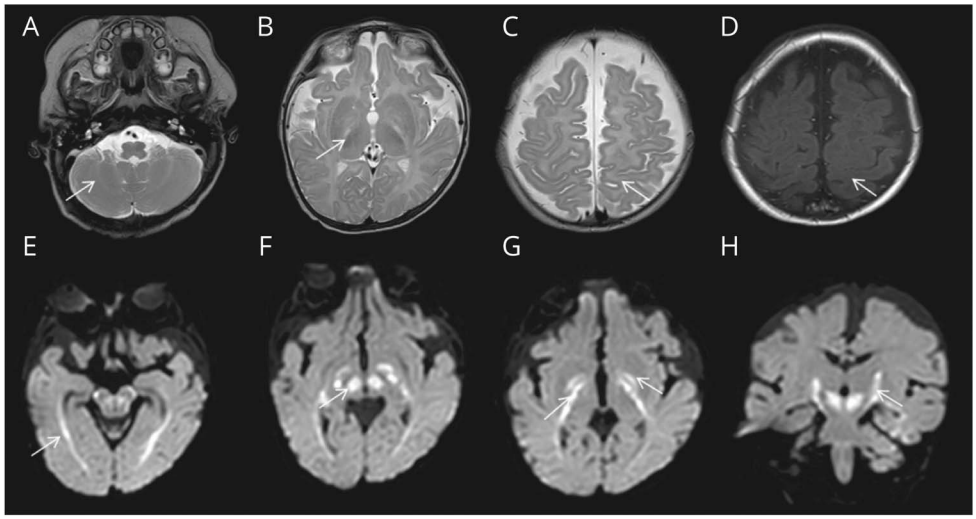
Figure MRI Brain at Age 4 Months



T2 (A–C) and T1-weighted (D) images depict lack of myelination in cerebellar white matter, posterior limb of internal capsule, and perirolandic regions (arrows). Diffusion-weighted imaging (E–H) shows diffusion restriction involving optic radiations (E), red nucleus and cerebral peduncle region (F), globus pallidus, and along corticospinal tract (G and H).

A 9-month-old girl presented with global developmental delay and refractory generalized seizures. Microcephaly, poor visual fixation, and intermittent dystonic posturing were observed on clinical examination. MRI brain (figure) revealed delayed myelination and restricted diffusion involving optic radiations, cerebral peduncles, red nuclei, globus pallidi, and corticospinal tract. EEG showed background slowing and multifocal epileptiform discharges. Workup revealed a homozygous, likely pathogenic variant in *ITPA* (c.124+1 G>A) and reduced inosine triphosphate pyrophosphohydrolase (ITPase) activity in skin fibroblasts (0.19 nmol/mg protein × h, controls 6.86 ± 2.51). Imaging pattern of delayed myelination and restricted diffusion is suggestive of ITPase deficiency in a child presenting with early infantile epileptic encephalopathy.[1,2]

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