

Answer: E. A, B only

MCQ Discussion:

Metronidazole is a commonly used antibiotic that easily penetrates the central nervous system and only rarely causes a toxic encephalopathy. Features of MIE may include headaches, nausea, ataxia, seizures and peripheral neuropathy. Most cases occur after long-term, high-cumulative doses of the drug. It poses a diagnostic challenge and characteristic MRI features often confirm the diagnosis (1). MRI assists to rule out other cerebellar lesions such as abscesses, tumors or ischemia; meanwhile, the classic focal findings differentiate it from more global processes such as hepatic encephalopathy. Most commonly the cerebellar dentate nuclei are involved, but the midbrain, dorsal pons and corpus callosum may be affected. The differential diagnosis of this presentation includes methyl bromide intoxication, maple syrup urine disease and enteroviral encephalomyelitis (2). These can be ruled out by lack of a contributory history. Wernicke's Encephalopathy is also a key differential, however a clear history of metronidazole use and reversibility upon drug discontinuation are factors that favor MIE.

It is believed that the MRI findings in MIE represent a toxic, metabolic process involving axonal swelling that resolves in a number of weeks once the drug is withdrawn. Moreover, up to 60% metronidazole is first metabolized in the liver through oxidation (2). Thus in severe liver disease there can be toxic accumulation of the drug and its metabolites and caution should be exercised in its administration to patients with hepatic dysfunction (3). Physicians need to be aware of this rare complication of a commonly prescribed medication and be especially vigilant when used in those with liver disease.

Image Legend:

Figure 1: T2 weighted MRI image showing symmetric bilateral hyper-intensity of the dentate nuclei.

Figure 2: FLAIR image of hyper-intense dentate nuclei.