Neurosciences Quiz

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A 40-year-old man with coma

Case Presentation

A 40-year-old alcoholic male drug addict was brought to the Emergency Room with generalized tonic clonic seizures and was found to be in deep coma. A CT scan of the brain was carried out.

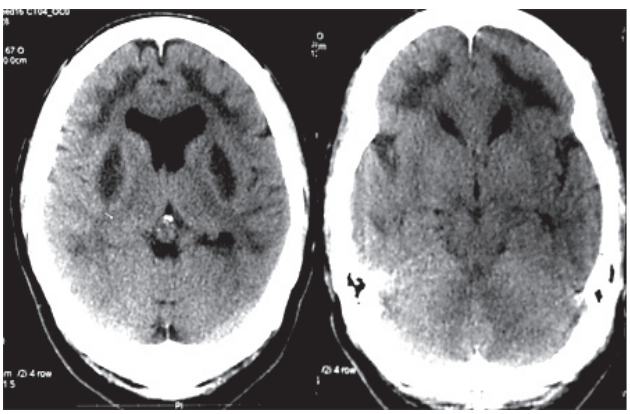

Figure 1.

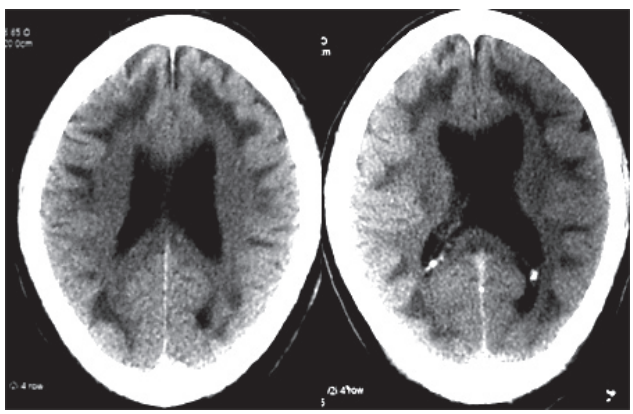

Figure 2.

Question:

Question 1: What are the CT findings?

Question 2: What is the most likely diagnosis?

Question 3: What is the differential diagnosis?

Answer

Computerized tomography scan without contrast showed bilateral putaminal hypodensity not involving the globus pallidus (**Figure 1**), in addition to bilateral symmetrical white matter hypodensity (**Figure 2**).

The most likely diagnosis is methanol poisoning, however carbon monoxide poisoning is another important possibility. Other differential diagnoses include Leigh's disease, and such a picture may be seen in children with glutaric aciduria type 1.

Discussion

Methanol (CH_3OH, wood alcohol) is a component of shellac, varnish, de-icing solutions, and other commercial preparations. In addition to the acid-base changes, other symptoms may develop in the 12-36 hours after ingestion. The initial complaints with methanol intoxication include weakness, nausea, headache, and decreased vision, which can progress to blindness, coma, and death in the absence of effective therapy. Eye examination may reveal mydriasis, decreased light reflex, a retinal sheen due to retinal edema, and hyperemia of the optic disk. Optic atrophy due to demyelination may follow in severe untreated cases, due to anoxia of the watershed areas caused by the edema. In addition, fronto-cerebral, putamen, and white matter demyelination may occur. The minimum lethal dose of methanol is 50-100 mL, although lesser quantities can induce permanent blindness. One series of 50 consecutive patients with methanol intoxication found that mortality was greater than 80% among individuals who presented with seizures, coma, or an initial arterial pH <7.0 In contrast, mortality rates of less than 6% were seen when these features were absent. Methanol is metabolized to formaldehyde (via alcohol dehydrogenase) and then formic acid. The general approach to any poisoned patient must include the following elements: 1. Evaluation, including the recognition that poisoning has occurred, identification of the agents involved, assessment of severity, and prediction of toxicity. 2. Management, consisting of supportive care, prevention of drug absorption, and, when appropriate, the administration of antidotes and enhancement of drug elimination. Prompt treatment is required to prevent death or permanent tissue injury. Gastric lavage should be performed if the patient is seen in the first few hours after drug ingestion to minimize further drug absorption. In addition, sodium bicarbonate should be given to correct the metabolic acidosis. Massive doses of sodium bicarbonate may be required if the acidosis is severe or there is continuing acid production. Fomepizole inhibits alcohol dehydrogenase rapidly and more potently than ethanol, which was used before, and is now the antidote of choice in cases of methanol intoxication

References

1. Megarbane B, Borron SW, Baud FJ. Current recommendations for treatment of severe toxic alcohol poisonings. ***Intensive Care Med*** 2005; 31: 189-195.
2. McMartin KE, Ambre JJ, Tephly TR. Methanol poisoning in human subjects: Role for formic acid accumulation in the metabolic acidosis. ***Am J Med*** 1980; 68: 414-418.
3. Jacobsen D, McMartin KE. Antidotes for methanol and ethylene glycol poisoning. ***J Toxicol Clin Toxicol*** 1997; 35: 127-143.
4. Girault C, Tamion F, Moritz F, Callonnec F, Droy JM, Bonmarchand G, et al. Fomepizole (4-methylpyrazole) in fatal methanol poisoning with early CT scan cerebral lesions. ***J Toxicol Clin Toxicol*** 1999; 37: 777-780.