Metronidazole-induced encephalopathy in a patient with infectious colitis: a case report

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Abstract

Introduction: Encephalopathy is a rare disease caused by adverse effects of antibiotic drugs such as metronidazole. The incidence of metronidazole-induced encephalopathy is unknown, although several previous studies have addressed metronidazole neurotoxicity. Here, we report the case of a patient with reversible cerebellar dysfunction on magnetic resonance imaging, induced by prolonged administration of metronidazole for the treatment of infectious colitis.

Case presentation: A 71-year-old Asian man, admitted to our hospital with hematochezia, underwent Hartmann’s operation for the treatment of colorectal cancer three years ago. He was diagnosed with an infectious colitis by colonoscopy. After taking metronidazole, he showed drowsiness and slow response to verbal commands. Brain magnetic resonance imaging showed obvious bilateral symmetric hyperintensities within his dentate nucleus, tectal region of the cerebellum, and splenium of corpus callosum in T2-weighted images and fluid attenuated inversion recovery images. Our patient’s clinical presentation and magnetic resonance images were thought to be most consistent with metronidazole toxicity. Therefore, we discontinued metronidazole, and his cerebellar syndrome resolved. Follow-up magnetic resonance imaging examinations showed complete resolution of previously noted signal changes.

Conclusion: Metronidazole may produce neurologic side effects such as cerebellar syndrome, and encephalopathy in rare cases. We show that metronidazole-induced encephalopathy can be reversed after cessation of the drug. Consequently, careful consideration should be given to patients presenting with complaints of neurologic disorder after the initiation of metronidazole therapy.

Introduction

Metronidazole is a commonly used antibiotic agent in various conditions such as anaerobic bacterial infections, protozoa infections (for example, giardiasis), Helicobacter associated gastritis, and hepatoencephalopathy. Previous reports have demonstrated that metronidazole toxicity may induce several neurologic side effects, including peripheral neuropathy, ataxic gait, dysarthria, convulsive seizures, and encephalopathy [1-4]. We describe the case of a patient with metronidazole-induced encephalopathy (MIE), with abnormalities found following brain magnetic resonance imaging (MRI), which had a successful outcome after discontinuation of metronidazole.

Case presentation

A 71-year-old Asian man, admitted with hematochezia, had previously been diagnosed with type 2 diabetes and underwent Hartmann’s operation for the treatment of colorectal cancer three years ago. He was diagnosed with an infectious colitis by colonoscopy. After taking intravenous metronidazole for 14 days, he took oral metronidazole for 14 days, and was discharged home. Three days after discharge, he presented to our emergency room with drowsiness and slow response to verbal commands. Neurological examination showed dysarthria, dysmetria on finger-to-nose examination, and an ataxic wide-based gait. Computed tomography (CT) performed on admission showed no evidence of acute hemorrhagic stroke and laboratory analysis was unremarkable. Thus, the preliminary diagnosis was cerebral infarction or metastatic disease. Our patient underwent brain magnetic resonance...
imaging (MRI). The results showed obvious bilateral symmetric hyperintensities within his dentate nucleus, tectal region of the cerebellum, and splenium of corpus callosum in T2-weighted images and fluid attenuated inversion recovery (FLAIR) images (Figure 1). The patient’s clinical presentation and MRI images were thought to be most consistent with metronidazole toxicity. Therefore, we decided to discontinue metronidazole, and the patient’s condition improved slowly. Three months after discontinuation of metronidazole, a follow-up examination showed that our patient’s cerebellar syndrome had resolved. Follow-up MRI examination showed complete resolution of previously noted signal changes (Figure 2).

**Discussion**

Metronidazole is available for treatment in anaerobic-related infections but may produce a number of neurologic side effects, such as cerebellar syndrome,
In this case, our initial prediction - considering his underlying disease - was either cerebrovascular accident or metastatic cancer rather than drug-induced encephalopathy. However, his clinical history and MRI findings strongly suggested MIE. Our patient’s symptoms resolved after cessation of the drug.

In the neurosurgical field, metronidazole is an alternative treatment for brain abscess in addition to surgical excision. Thus, a neurosurgeon should be able to recognize the adverse effects of metronidazole and a need for early diagnosis of MIE.

Conclusions
Our case illustrates that metronidazole can cause reversible neurotoxicity. Appropriate neurological examinations, early diagnosis using MRI, and prompt cessation of the medication will lead to a better prognosis. Therefore, awareness of the potential neurological side effects of metronidazole and an accurate clinical impression of the attending physician is very important in metronidazole-induced encephalopathy.

Consent
Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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