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Case Report
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# Uncommon Side Effect of Commonly Used Over the Counter Drug

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## Abstract

Metronidazole is a commonly used over the counter antibiotic with a wide range of applications esp. for diarrhea in India. While it is generally considered safe, rare neurological side effects have been reported. We present a case of metronidazole-induced cerebellar toxicity in a 54-year-old male patient who presented with symptoms of ataxia and dysarthria. Neurological examination and diagnostic tests confirmed the presence of cerebellar dysfunction. The symptoms resolved gradually after discontinuation of metronidazole, indicating a causal relationship. This case highlights the importance of recognizing metronidazole-induced cerebellar toxicity as a potential side effect and the need for close monitoring during treatment.

## Introduction

Metronidazole, a nitroimidazole antibiotic, is widely used for the treatment of various infections caused by anaerobic bacteria and protozoa. It exerts its antimicrobial effect by inhibiting DNA synthesis in susceptible microorganisms. While metronidazole is generally well-tolerated, it has been associated with rare neurological side effects, including cerebellar toxicity [1]. High concentration of metronidazole in brain extracellular fluid contributes to central nervous system toxicity [2]. In case with history of metronidazole intake and clinical suspicion, neuroimaging is the modality for diagnosis [3]. Also, the signs and symptoms of toxicity resolves with cessation of metronidazole [4]. Cerebellar toxicity refers to the impairment of cerebellar function, leading to symptoms such as ataxia, dysarthria, and nystagmus. Here, we present a case of metronidazole-induced cerebellar toxicity in a middle-aged male patient.

## Case Presentation

A 54-year-old male patient with no significant medical history presented to the OPD with complaints of unsteady gait and slurred speech that had developed over the past 4 weeks. He had history of intermittent episodes of diarrhea for last 2 years for which he used to take metronidazole 500 mg thrice daily for 5 to 7 days every fortnightly. He denied any history of head trauma, recent illnesses, or other medication use.

**Clinical Findings:** On examination, the patient had a broad-based and unsteady gait, with a tendency to fall to either side. He exhibited dysarthria, characterized by slurred speech and difficulty articulating words. There were no signs of cranial nerve abnormalities or sensory deficits and bladder/bowel incontinence. The rest of the physical examination was unremarkable.

**Diagnostic Investigations:** Laboratory investigations, including complete blood count, liver function tests, renal function tests, and electrolyte levels, were within normal limits. Magnetic Resonance Imaging (MRI) of the brain revealed T2/FLAIR hyperintensity in bilateral dentate nucleus as shown in Figure 1. An Electroencephalogram (EEG) was performed, which showed no epileptiform activity.

**Treatment and Outcome:** Considering the temporal relationship between the initiation of metronidazole therapy and the onset of symptoms, a diagnosis of metronidazole-induced cerebellar toxicity was suspected. The antibiotic was discontinued, and the patient was closely monitored. Patient was seen by gastroenterologist and diagnosed as irritable bowel syndrome and appropriate treatment for his diarrhea was started so that he doesn't consume more metronidazole later. Over the course of the next few weeks, the patient's symptoms gradually improved. At a follow-up visit one month later, he had regained normal gait and speech, with no residual deficits.

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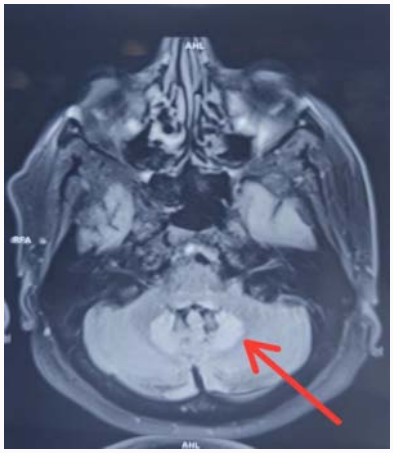

**Figure 1:** Dentate nucleus hyperintensity seen in this T2/Flair MRI section of cerebellum.

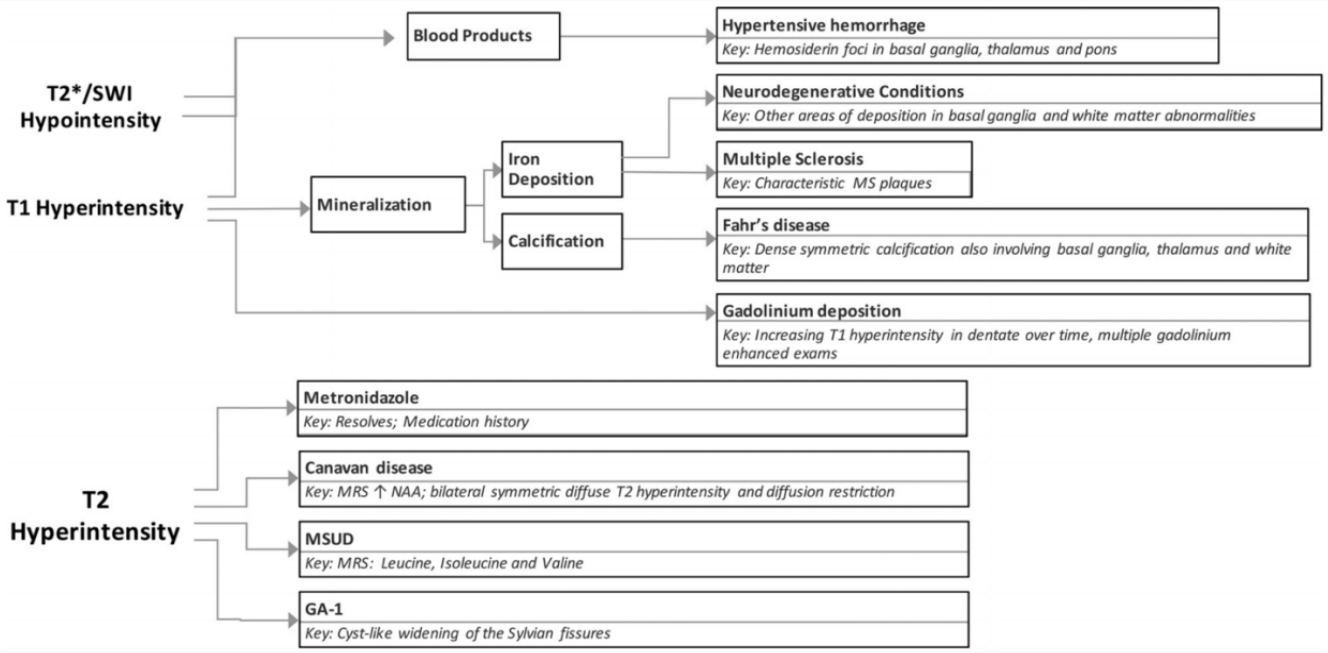


**Figure 2:** Diagnostic approach to dentate nucleus abnormality in MRI [7].

## Discussion

Metronidazole-induced cerebellar toxicity is a rare adverse effect but should be considered in patients presenting with acute onset cerebellar symptoms during or after metronidazole treatment. The exact mechanism of this toxicity is not fully understood. It is believed to involve the formation of toxic metabolites that impair the function of cerebellar neurons. A systematic review done by Kuriyama et al. on metronidazole induced central nervous system toxicity, 77% of patients had cerebellar dysfunction, 33% had altered mental status and 15% had seizures. Average age of patients was 53.3 years and 64% of patients were male and median duration of metronidazole intake was 54 days. 65% had complete resolution of their symptoms with discontinuation of metronidazole therapy. Most patients presenting with cerebellar dysfunction had symptoms like dysarthria, ataxia, dysmetria and nystagmus in decreasing order [5]. The symptoms typically resolve upon discontinuation of metronidazole, as seen in our case. According to Kim et al. in cases of metronidazole induced encephalopathy MRI demonstrates bilaterally symmetrical brain lesions at cerebellar dentate nuclei, dorsal medulla, dorsal pons, midbrain and splenium of corpus callosum [6]. In our case, symmetrical hyperintense focus was noted in dentate nucleus of bilateral cerebellum. A review of dentate nucleus abnormality was done by Bond et al. which describes various differentials associated with it and Figure 2 describes the approach towards it [7].

## Conclusion

This case report emphasizes the importance of recognizing metronidazole-induced cerebellar toxicity as a potential side effect. Prompt identification and discontinuation of metronidazole can lead to a favorable outcome in affected patients. Healthcare professionals should be aware of this potential adverse reaction and exercise caution while prescribing metronidazole, particularly in patients with a predisposition to cerebellar dysfunction. Further research is needed to better understand the underlying mechanisms and risk factors associated with metronidazole-induced cerebellar toxicity.

## References


1. Hernández Ceruelos A, Romero-Quezada LC, Ruvalcaba Ledezma JC, López Contreras L. Therapeutic uses of metronidazole and its side effects: An update. Eur Rev Med Pharmacol Sci. 2019;23(1):397-401.
2. Frasca D, Dahyot-Fizelier C, Adier C, Mimoz O, Debaene B, Couet W, et al. Metronidazole and hydroxymetronidazole central nervous system distribution: 1. microdialysis assessment of brain extracellular fluid concentrations in patients with acute brain injury. Antimicrob Agents Chemother. 2014;58(2):1019-23.
3. Roy U, Panwar A, Pandit A, Das SK, Joshi B. Clinical and neuroradiological spectrum of metronidazole induced encephalopathy: Our experience and the review of literature. J Clin Diagn Res. 2016;10(6):OE01-9.
4. Woodruff BK, Wijdicks EF, Marshall WF. Reversible metronidazole-induced lesions of the cerebellar dentate nuclei. N Engl J Med. 2002;346(1):68-9.
5. Kuriyama A, Jackson JL, Doi A, Kamiya T. Metronidazole-induced central nervous system toxicity: A systematic review. Clin Neuropharmacol. 2011;34(6):241-7.
6. Kim E, Na DG, Kim EY, Kim JH, Son KR, Chang KH. MR imaging of metronidazole-induced encephalopathy: lesion distribution and diffusion-weighted imaging findings. AJNR Am J Neuroradiol. 2007;28(9):1652-8.
7. Bond KM, Brinjikji W, Eckel LJ, Kallmes DF, McDonald RJ, Carr CM. Dentate Update: Imaging Features of Entities That Affect the Dentate Nucleus. AJNR Am J Neuroradiol. 2017;38(8):1467-74.