

CASE REPORT

METRONIDAZOLE ASSOCIATED SIDE EFFECT IN CEREBELLUM: A CASE REPORT

Naila Younus¹, Shumaila Younus², Muhammad Ali¹, Kashif Shazlee¹

¹Department of Radiology, ²Department of Oral Pathology, Ziauddin University, Karachi.

ABSTRACT

We interpret a case, manifesting Magnetic Resonance (MR) imaging features in relation with Metronidazole (Flagyl) toxicity. MRI brain exhibited an abnormal signal intensity comprising symmetrically bilateral dentate nuclei of cerebellum. The metronidazole toxicity was identified on MR imaging characteristics and reinforced on a clinical basis. In the hospital, metronidazole was stop. Patient recovered clinically with cessation of metronidazole. Follow-up MR imaging was not performed. In this report, we present a case establishing a characteristic finding in MR images within the dentate nuclei of cerebellum. Patient was treated for liver abscess and presented with slurring of speech, generalized weakness, and dysarthria.

Keywords: Dentate nuclei, Cerebellum, Metronidazole Toxicity, MRI

Corresponding Author:

Dr. Naila Younus
Department of Radiology,
Ziauddin University & Hospital, Karachi.
Email: nailadr213@gmail.com

INTRODUCTION

Metronidazole (Flagyl) is a frequently prescribed drug of choice in multiple diseases, including anaerobic bacterial infections, protozoal infections (such as, giardiasis), Helicobacter related gastritis, and hepatic encephalopathy. Past case reports have also indicated that metronidazole toxicity can produce considerable neurological adverse effects, possessing peripheral neuropathy, dysarthria, seizures, ataxic gait and encephalopathy. MRI study brain revealed abnormal symmetrical signals in dentate nuclei of cerebellum bilaterally. The conclusion of metronidazole toxicity was formed by MR imaging features and confirmed clinical basis. Metronidazole is considered to permeate Cerebro-Spinal Fluid (CSF) and the central nervous system (CNS) readily. Metronidazole induced toxicity can comprise the central and peripheral nervous system specifically at dosages rate rising 2g/day for the extended period of time.¹ Metabolism of metronidazole occurs in the liver and can be circulated by the cerebrospinal fluid and also move across the blood-brain barrier, and could cause encephalopathy.²

CASE REPORT

A 65-years old female clinically presentation of fever, slurring of speech, generalized weakness, dysarthria and dehydration for 3 days. She had no

history of headache, loss of consciousness, fall or seizures, urinary complaints and neurological deficits. Her systemic examination and blood hematology and biochemistry were insignificant. Her past history revealed that she had been diagnosed one month back as a case of liver abscess. She was receiving Flagyl 750mg I/VTDS. After that she developed these symptoms. Patient went for MRI and MRA. The study shows bilateral hyper intense signals on T2W and fluid-attenuated inversion-recovery images involving the dentate nuclei of cerebellum. No evidence of the hemorrhage was seen. History, clinical features and the long metronidazole medication favors the diagnosis of metronidazole toxicity. The patient was switched to another antibiotic and after the cessation, patient condition was improved.

DISCUSSION

Metronidazole is extensively applied for treatment of Trichomoniasis, Giardiasis, Amebiasis, and anaerobic infections, yield multiple neurological adverse effects such as peripheral neuropathy, cerebellar dysfunction, seizures, encephalopathy, 3,6 MIE could occur in both men and women of any age group. There are three common patterns of MIE, including cerebella dysfunction, altered mental status, and seizures.^{4,5}

Metronidazole is feasible for medication in anaerobic associated diseases. However, may

cause neurological features like cerebellar syndrome. The reversible findings corresponded with the acute harmful aspects of Metronidazole are commonly because of swelling of axons with a raised water component except than ademyelinating mechanism.

Another supplementary suggested process includes a spasm of vessels that can give low reversible local ischemic changes. MRI in cases with MIEs represents T2 abnormal hyperintense signals in the dentate nuclei of cerebellum which are frequently affected. Others areas also includes the midbrain, dorsal pons, dorsal medulla, and corpus callosum.³ Atypical region comprises the white matter of the cerebral hemisphere and the inferior olivary nucleus.^{3,6} Bilaterally symmetrical foci, are a classic impression of metabolic encephalopathy.^{7,1}

It is crucial to discriminate demyelinating disorders and other metabolic illness like Wernicke's encephalopathy and osmotic myelinolysis with pontine or extra-pontine destruction. Wernicke's encephalopathy (WE) is apparently the most prevalent and confounding differential diagnosis. Although WE, although display a predominance for mid brain and diencephalon and is related with chronic alcoholism. Hence, it is still difficult to separate it from MIE absolutely.⁸ The span of medication correlated with metronidazole before cerebellar symptoms illustrated is different, and the cumulative dose range is from 25 g to 110 g.⁹ We must realize of MIE when treating acute neurological deficits with the prolonged use of metronidazole, more specifically with low nutritional condition.¹⁰

CONCLUSION

Metronidazole-induced encephalopathy is an atypical but possible reversible affect in patients with acute neurological problem from the prolonged treatment of metronidazole. This case

demonstrates that, quick identification using MRI, and immediate termination will guide you to a better diagnosis and management.

REFERENCES

1. Kim H, Kim YW, Kim SR, Park IS, Jo KW. Metronidazole-induced encephalopathy in a patient with infectious colitis: a case report. *J Med Case Rep* 2011;5(1):63.
2. Naqi R, Azeemuddin M, Beg MA. Magnetic Resonance Imaging of metronidazole induced encephalopathy. *J Pak Med Assoc* 2012;62(8):843.
3. Huang YT, Chen LA, Cheng SJ. Metronidazole-induced encephalopathy: case report and review literature. *Acta Neurol Taiwan* 2012;21(2):74-8.
4. Kalia V, Vibhuti KS. Case report: MRI of the brain in metronidazole toxicity. *Indian J Radiol Imaging* 2010;20(3):195.
5. Chakrabarti S, Pan K. Metronidazole-induced encephalopathy: an uncommon scenario. *N Z Med J* 2014;127(1393):120-2.
6. Mulcahy H, Chaddha SK. MRI of Metronidazole-Induced Encephalopathy. *Radiol Case Rep* 2008 1;3(4): 239.
7. 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. *Am J Neuroradiol* 2007;28(9):1652-8.
8. Cheong HC, Jeong TG, Cho YB, Yang BJ, Kim TH, Kim HC, et al. Metronidazole-induced encephalopathy in a patient with liver cirrhosis. *Korean J Hepatol* 2011;17(2):157-60.
9. Medhajibapath S, Suankratay C. Metronidazole-induced Encephalopathy. *J Infect Dis Antimicrob Agents* 2014;31:51-6.
10. Kuriyama A, Jackson JL, Doi A, Kamiya T. Metronidazole-induced central nervous system toxicity: a systematic review. *Clinical Neuropharmacol* 2011;34(6):241-7.