Mystery Case: Metronidazole-induced encephalopathy

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Figure Fluid-attenuated inversion recovery

(A, B) Symmetric hyperintense lesions in the cerebellar dentate nuclei, superior colliculi, and periaqueductal gray matter (arrows).

An 84-year-old woman who received 2-month oral metronidazole therapy (500 mg 3 times daily) for *Clostridium difficile*-associated diarrhea was hospitalized for falls. Clinical examination revealed moderate dysarthria and cerebellar ataxia. MRI performed at admission showed bilateral fluid-attenuated inversion recovery (FLAIR) symmetric hyperintense lesions in cerebellar dentate nuclei, superior colliculi, and periaqueductal gray matter (figure). Biological investigations showed no vitamin B₁, B₉, or B₁₂ deficiency. Dysarthria and gait disturbance resolved within days after interruption of the metronidazole treatment. Metronidazole-induced encephalopathy must be considered whenever a patient on metronidazole experiences a subacute cerebellar syndrome.¹

AUTHOR CONTRIBUTIONS

Abhinav Dhar: drafting/revising the manuscript, study concept or design, analysis or interpretation of data, accepts responsibility for conduct of research and final approval, acquisition of data, study supervision. Ionela Manoila: analysis or interpretation of data, accepts responsibility for conduct of research and final approval, acquisition of data. Marie-Hélène Dugay: drafting/revising the manuscript, analysis or interpretation of data, accepts responsibility for conduct of research and final approval, acquisition of data. François Sellal: drafting/revising the manuscript, study concept or design, accepts responsibility for conduct of research and final approval, acquisition of data, study supervision.

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DISCLOSURE

The authors report no disclosures relevant to the manuscript. Go to Neurology.org for full disclosures.

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MYSTERY CASE RESPONSES

The Mystery Case series was initiated by the *Neurology*[®] Resident & Fellow Section to develop the clinical reasoning skills of trainees. Residency programs, medical student preceptors, and individuals were invited to use this Mystery Case as an educational tool. Responses were solicited through a group e-mail sent to the American Academy of Neurology Consortium of Neurology Residents and Fellows and through social media.

Of the 28 respondents, 100% correctly identified metronidazole as the offending antibiotic. Seventy-one percent correctly recognized bilateral, symmetric FLAIR hyperintensities in the cerebellar dentate nuclei but only 31% of respondents also mentioned hyperintense

lesions in the dorsal midbrain, including in the superior colliculi and periaqueductal gray matter, for a fully correct answer. Jeremy Cutsworth-Gregory submitted the most complete response. One person mentioned “cerebellar infarctions” but MRI brain lesions caused by metronidazole are usually reversible and prognosis for recovery is good once the medication is discontinued. Another respondent said cephalosporins or penicillins could also cause a similar clinical scenario. While they could lead to encephalopathy, the imaging in this case is very specific for neurotoxicity secondary to metroni-

dazole. Bhattacharyya et al.¹ published an excellent review of antibiotic-associated encephalopathies earlier this year.

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1. Bhattacharyya S, Darby RR, Raibagkar P, Gonzalez Castro LN, Berkowitz AL. Antibiotic-associated encephalopathy. *Neurology* 2016;86:963–971.

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