

Abstract

- Autoimmune encephalitis is a group of conditions characterized by a rapid onset of neurological symptoms such as seizures and cognitive impairment, and psychiatric disturbances such as behavioral changes and psychosis.
- Viral infections are common, well-documented triggers, but the role of bacterial pathogens, particularly *Mycoplasma pneumoniae*, remains poorly understood. *Mycoplasma pneumoniae* has been implicated in autoimmune encephalitis previously, but reported cases are rare.
- This report presents a case of *Mycoplasma*-induced seronegative autoimmune encephalitis in a previously healthy adult, highlighting the diagnostic challenges and the need for early recognition. The patient, a 37-year-old male with a past medical history of asthma, presented with encephalopathy and confusion following a fall in the shower a few hours previously. He then experienced refractory seizures necessitating intensive immunosuppressive and antimicrobial therapy.
- After nearly a 4 month hospital stay primarily in the intensive care unit, the patient finally returned to his baseline neurological status and was discharged home after 4 days without neurological deficits or seizures.

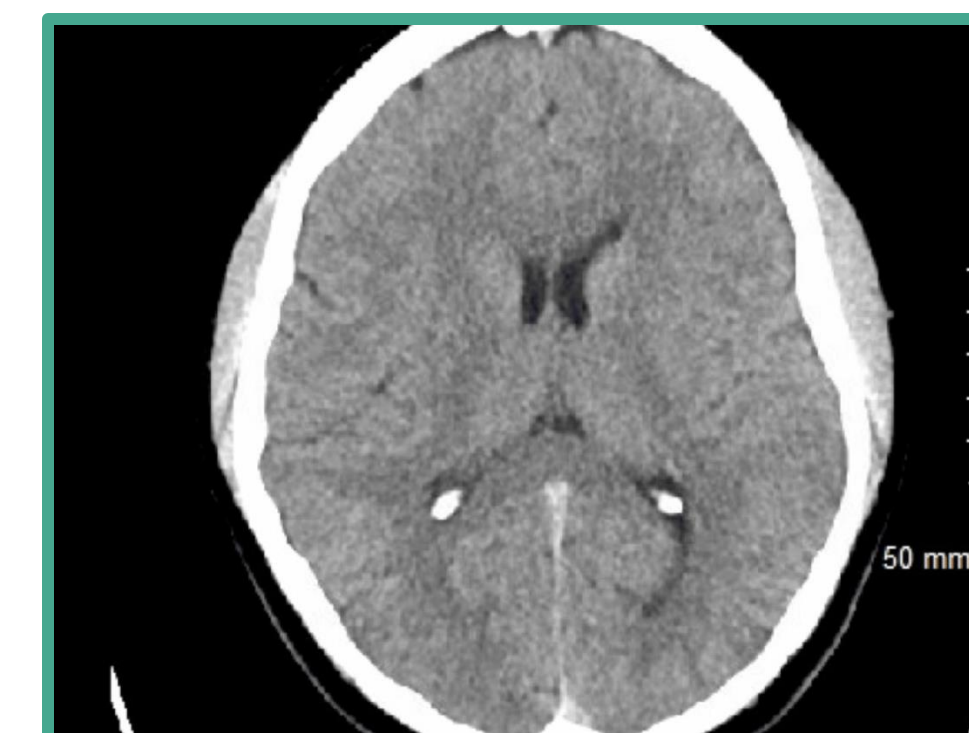
Introduction

- Autoimmune encephalitis refers to a group of inflammatory brain disorders caused by an abnormal immune response in which the body's immune system mistakenly attacks components of the central nervous system.
- Viral infections are recognized as potential triggers for autoimmune encephalitis, with Herpes simplex virus and Varicella zoster virus being the most commonly linked pathogens. However, *Mycoplasma pneumoniae*, which is usually associated with atypical pneumonia and respiratory tract infections, has also been linked to the etiology of autoimmune encephalitis.
- This report presents a rare case of *Mycoplasma*-induced autoimmune encephalitis, outlining the clinical presentation, overall diagnostic approach, and therapeutic interventions. It emphasizes the severity of this condition and its capacity to cause seizures and other neurological complications that require intensive care.

Case Presentation

History of Present Illness

- 37-year-old man presented with seizures, confusion, and encephalopathy, beginning six hours prior to arrival. His wife reported the patient woke up confused that morning. He then fell in the shower, and she found him on the floor seizing.
- Upon arrival, the patient was febrile, tachycardic, and blood pressure 109/60. The patient was not oriented to time, person, or place. Physical examination showed no abnormalities. Initial workup showed no metabolic derangements in his blood work and CT scan of the head revealed no acute ischemic or hemorrhagic injury.
- He was initially loaded with levetiracetam but developed refractory seizures and worsening mental status requiring ICU admission and mechanical ventilation.



Evaluation and Workup

- Therapy with four anti-seizure medications: levetiracetam, lacosamide, topiramate (via NG tube), and fosphenytoin, all at maximum doses.
- Diagnostic workup: Normal CSF analysis with negative bacterial, viral, and fungal studies, unremarkable brain MRI and MRA, negative urine drug screen, negative testicular ultrasound (to rule out paraneoplastic limbic encephalitis), and negative serum autoimmune encephalitis panel.
- Due to persistent status epilepticus, the patient was paralyzed with cisatracurium and placed on a pentobarbital-induced coma, which ultimately controlled the seizures.
- Mycoplasma pneumoniae* IgM later returned positive, supporting a diagnosis of seronegative autoimmune encephalitis triggered by *Mycoplasma*.
- He was treated with IVIG, high-dose methylprednisolone, and a seven-day course of IV azithromycin. His course was complicated by bilateral pulmonary emboli with right heart strain, Pseudomonas UTI, and polymicrobial bacteremia (*Enterobacter cloacae* and *E. coli*), requiring antimicrobial and anticoagulation therapy.

Conclusions

- After approximately one month, he was weaned off sedatives, stabilized on antiseizure medications, and discharged with plans for neurology follow-up and six months of Lovenox.
- Autoimmune encephalitis can occur in the absence of detectable autoantibodies, which poses a significant diagnostic challenge.
- Mycoplasma pneumoniae* is a rare but recognized trigger, thought to induce encephalitis via immune-mediated mechanisms rather than direct CNS invasion.
- In this case, the patient's unremarkable MRI, CSF studies, and negative antibody panel initially obscured the diagnosis, but clinical suspicion remained high due to the severity and refractory nature of his seizures.
- Treatment required a multimodal approach including IVIG, corticosteroids, antibiotics, and escalation to pentobarbital coma and plasmapheresis due to status epilepticus refractory to standard antiepileptic therapy.

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