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# Anti-NMDA Receptor Encephalitis: A Case Report and Clinical Insights

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## Case Report

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## ABSTRACT

Anti-N-methyl-D-aspartate (NMDA) receptor encephalitis is a rare but increasingly recognized autoimmune neurological disorder characterized by psychiatric symptoms, seizures, movement abnormalities, and autonomic dysfunction. Early diagnosis and prompt immunotherapy are crucial for favorable outcomes. This case report describes a young female patient presenting with acute neuropsychiatric manifestations, later diagnosed with anti-NMDA receptor encephalitis. The clinical course, diagnostic challenges, management strategies, and outcomes are discussed to highlight the importance of early recognition and multidisciplinary care in managing this condition.

## KEYWORDS

Anti-NMDA receptor encephalitis, Autoimmune encephalitis, Neuropsychiatric symptoms, Seizures, Immunotherapy

## INTRODUCTION

Anti-NMDA receptor encephalitis is an autoimmune encephalitis caused by antibodies directed against NMDA receptors in the brain. First described in 2007, the condition has gained recognition as a significant cause of encephalitis, particularly in young individuals. It is often associated with tumors, especially ovarian teratomas, although it can also occur in the absence of neoplasms.

The disease typically presents with a constellation of psychiatric symptoms, seizures, memory deficits, movement disorders, and autonomic instability. Due to its diverse and often misleading presentation, it is frequently misdiagnosed as a primary psychiatric disorder, leading to delays in appropriate treatment.

This case report aims to present a detailed clinical scenario of anti-NMDA receptor encephalitis and discuss its diagnostic and therapeutic challenges.

## CASE PRESENTATION

A 22-year-old female with no significant past medical history was brought to the emergency department with complaints of acute behavioral changes for one week. The patient exhibited agitation, hallucinations, and disorganized speech. Family members reported that she had been previously healthy but had recently developed insomnia, anxiety, and episodes of inappropriate laughter.

On initial evaluation, the patient was restless, disoriented, and uncooperative. Vital signs were within normal limits. Neurological examination was limited due to poor cooperation but did not reveal any focal deficits. A provisional diagnosis of acute psychosis was considered, and the patient was admitted for further evaluation.

Over the next few days, her condition deteriorated. She developed generalized tonic-clonic seizures, followed by episodes of unresponsiveness. She also exhibited orofacial dyskinesias and abnormal limb movements. Autonomic instability became evident, with fluctuations in blood pressure and heart rate.

Given the rapid progression and neurological involvement, an organic cause was suspected. Magnetic resonance imaging (MRI) of the brain was unremarkable. Electroencephalography (EEG) showed diffuse slowing with occasional epileptiform discharges. Cerebrospinal fluid (CSF) analysis revealed mild lymphocytic pleocytosis and elevated protein levels.

Further testing for autoimmune encephalitis was performed. CSF and serum samples were positive for anti-NMDA receptor antibodies, confirming the diagnosis.

A thorough evaluation for underlying malignancy was conducted, including pelvic ultrasound and computed tomography (CT) scan, which revealed a small ovarian teratoma.

**Management**

The patient was started on first-line immunotherapy, including high-dose intravenous corticosteroids and intravenous immunoglobulin (IVIG). Antiepileptic drugs were administered to control seizures, and supportive care was provided in the intensive care unit.

Given the presence of an ovarian teratoma, surgical removal of the tumor was performed. Postoperatively, the patient showed gradual improvement in neurological and psychiatric symptoms.

Despite initial improvement, the patient experienced residual cognitive deficits and required rehabilitation. A second-line immunotherapy with rituximab was considered due to the severity of her condition.

**Outcome and Follow-Up**

Over a period of three months, the patient showed significant recovery. Psychiatric symptoms resolved, and seizure activity was controlled. Cognitive function improved gradually, although mild memory impairment persisted.

At six-month follow-up, the patient was able to resume daily activities with minimal assistance. No relapse was observed, and repeat antibody testing showed a decrease in titers.

## DISCUSSION

Anti-NMDA receptor encephalitis is an important differential diagnosis in young patients presenting with acute psychiatric symptoms and neurological deterioration. The disease follows a characteristic clinical course, often beginning with psychiatric manifestations, followed by neurological complications.

Early recognition is essential, as prompt immunotherapy and tumor removal significantly improve outcomes. The presence of anti-NMDA receptor antibodies in CSF is considered diagnostic.

The pathophysiology involves antibody-mediated disruption of NMDA receptor function, leading to impaired synaptic transmission. This explains the diverse clinical features, including cognitive dysfunction, seizures, and movement disorders.

Management typically involves a combination of immunotherapy and tumor removal when applicable. First-line treatments include corticosteroids, IVIG, and plasmapheresis, while second-line therapies such as rituximab and cyclophosphamide are used in refractory cases.

Despite its severity, the prognosis of anti-NMDA receptor encephalitis is generally favorable with early treatment. However, delayed diagnosis can lead to prolonged hospitalization, complications, and long-term neurological deficits.

## CONCLUSION

This case highlights the importance of considering anti-NMDA receptor encephalitis in patients with acute neuropsychiatric symptoms. Early diagnosis, prompt immunotherapy, and multidisciplinary management are crucial for improving outcomes.

Increased awareness among clinicians can help reduce diagnostic delays and ensure timely intervention, ultimately leading to better patient recovery.

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