

# Anti- NMDAR Autoimmune Encephalitis Presenting as Acute Psychosis: A Case Report

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## ABSTRACT

Anti-NMDA receptor (NMDAR) encephalitis is a recently identified autoimmune disorder with prominent psychiatric symptoms. Patients usually present with acute behavioral change, psychosis, catatonic symptoms, memory deficits, seizures, dyskinesias, and autonomic instability. We present a case of a 13-year old who presented with noticeably chirpiness, excessive talking with unknown people and wandering around the neighborhood without purpose. The main symptoms of the patient and the important clinical findings were irrelevant talking which later developed into slurring of speech, abnormal movements and memory loss. This case is an example of how easily we are misled towards diagnosis based on the present symptoms. The patient suffered the unnecessary stigma of a psychiatric illness, which might stay imprinted on her for a long time. In this report we call for attention to the inclusion of anti-NMDAR encephalitis in the differential diagnosis of acute psychosis. It adds on to show that NMDAR might present in the most unexpected and unpredictable ways, sometimes misleading the patient away from medical help. Prompt diagnosis is critical as early immunotherapy and tumor removal could dramatically affect outcomes.

**Keywords:** anti-NMDAR; encephalitis; autoimmune; psychosis.

## INTRODUCTION

*N*-methyl-d-aspartate receptor (NMDAR) antibody encephalitis is a potentially fatal autoimmune syndrome in which there is antibody production against the NMDAR causing profound dysregulation of neurotransmission.<sup>1</sup> The syndrome disproportionately affects women. Patients most often present with a constellation of neuropsychiatric signs and symptoms, including memory loss, hallucinations, and decreased level of consciousness. This condition is lethal if left untreated. Immunotherapy and surgical resection of the culprit malignancy often results in the rapid resolution of symptoms.

Patients usually present with acute behavioral change, psychosis, and catatonia that evolve to include seizures, memory deficit, dyskinesias, speech problems, and autonomic and breathing dysregulation.<sup>2</sup> When severe, the disorder may become life-threatening and intensive care treatment is warranted.<sup>3</sup> Roughly 5% of patients with this diagnosis eventually die, most often as a result of neurological and autonomic dysfunction.

The case report outlined below discusses the clinical presentation, workup, and treatment of a patient diagnosed with anti-NMDAR encephalitis. Key features of this disorder, such as a clinical presentation dominated by psychosis, are emphasized. This report thus highlights the increasing need for psychiatrists and other relevant medical disciplines to become aware of this underdiagnosed disorder and consider it in their differential diagnosis.

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## CASE REPORT

A previously healthy 13 years old female was referred from Kapilvastu, with complains of insidious onset, gradually progressive behavioral change in the form of excessive talkativeness to unknown people, hallucinations and abnormal left leg and hand movement. No medical, family, and psychosocial history including relevant genetic information. Her behavior started to concern her family as it was very drastic to what she was. She started to wander around the neighborhood aimlessly and upon asked she couldn't remember why or where she was going. After these symptoms she started developing abnormal perception of smell and abnormal posturing of body in form of abnormal finger and wrist movement that was sustained and mostly twisting in nature. This was associated with impairment of her recent memory. There is no history of loss of consciousness, joint pain, rashes, fever, shortness of breath or bowel bladder involvement.

In the emergency room of children hospital, Kathmandu she was given steroids and sedatives. With normal findings in CT scan and MRI scan, the investigations were limited. The patient then decided to move to a private hospital for better treatment and confirm diagnosis. Further investigation was done in visited private hospital. The doctors concluded that the patient should be consulted with a child psychiatrist and follow up with a neurologist. The patient was more stable than before so she was discharged. The patient's family sought help from experts. Here a team of neurologists investigated her. CT scan was repeated with further more tests. CT scan had normal findings again. Cerebrospinal fluid was sent for serological testing of Anti-NMDAR antibodies. CSF serology results returned where the assay detected IgG antibodies in transfected HEK cells. Autoantibodies against surface antigens

are found in patients with autoimmune encephalopathy since the antigens play a direct or indirect role in synaptic signal transduction and plasticity. The associated auto immunities manifest with seizures and neuropsychiatric symptoms. The resulting syndromes can have non-paraneoplastic (PNS) etiology.

Test Name	Results	Units	Bio. Ref. Interval
AUTOIMMUNE ENCEPHALITIS PANEL @ (IFA)			
Sample Type	CSF		
AMPA (anti-glutamate) - GluR1	Negative		Negative
AMPA (anti-glutamate) - GluR2	Negative		Negative
GABA-B receptor antibody	Negative		Negative
LGI-1 antibody(VGKC type)	Negative		Negative
CASPR2 antibody(VGKC type)	Negative		Negative
NMDA (anti-glutamate receptor against NR1 subunit)	Positive		Negative

Patient was treated with immunosuppressive therapy; immunoglobulin, rituximab, anti-seizure with supportive medication along with gait physiotherapy.

## DISCUSSION

Despite a growing body of evidence, Anti-N-methyl-D-aspartate receptor encephalitis remains under-recognized. Prompt diagnosis and early immunotherapy can lead to full recovery of neuropsychiatric function as we report in our patient.

Anti-NMDA-R encephalitis is an autoimmune disorder with a complex presentation, including psychiatric symptoms, memory deficits, and autonomic instability.<sup>4</sup> Roughly 80% of patients are females, with the majority presenting during early adulthood.

While the majority of patients present with a combination of behavioral, cognitive,

and motor symptoms, as well as speech disorder, seizures, and decreased level of consciousness, psychiatric symptoms often predominate in the early phases. Such a presentation often leads patients to first seek psychiatric evaluation and treatment, causing a crucial delay in diagnosis and institution of immunotherapy.<sup>5</sup> Moreover, a recent large cohort-based study revealed that 4% of patients presented with isolated psychiatric episodes (pure psychiatric symptoms without neurological involvement).<sup>6</sup> In this cohort MRI of the brain, EEG and CSF studies were abnormal in 33%, 90%, and 79% of patients, respectively. Moreover, results of these ancillary tests in patients with isolated psychiatric episodes were similar to the cohort population at large. As early recognition of these episodes and institution of appropriate therapy was shown to be an important prognostic factor, the authors recommended that, in patients with new onset psychosis, history of encephalitis, subtle neurological symptoms and abnormal, albeit non-specific, CSF, EEG, or MRI findings, prompt screening for NMDAR antibodies, and ovarian teratoma when applicable, should be performed.<sup>7</sup>

In summary, the present case illustrates the pertinent need for psychiatrists, neurologists, and other emergency-room physicians to become aware of anti-NMDA-R encephalitis. Although the typical presentation involves a combination of behavioral, cognitive, and motor symptoms, isolated psychiatric episodes can occur. The inclusion of this disorder in the differential diagnosis is critical,

as prompt initiation of immunotherapy and tumor removal, if appropriate, could dramatically affect outcome.

**CONSENT:** Informed consent was taken from the father of the patient.

**CONFLICT OF INTEREST:** None

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