

2019

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Recommended Citation

Obi CA, Thompson E, Mordukhaev L, Khan I, Zhang NJ. Anti-N-methyl-d-aspartate receptor encephalitis triggered by emotional stress. . 2019 Jan 01; 32(4):Article 5109 [p.]. Available from: <https://academicworks.medicine.hofstra.edu/articles/5109>. Free full text article.

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Anti-*N*-methyl-D-aspartate receptor encephalitis triggered by emotional stress

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ABSTRACT

A 22-year-old woman presented with disorganized behaviors, restlessness, and subacute decline in mental status in the setting of stress. Extensive workup for autoimmune diseases disclosed positive anti-*N*-methyl-D-aspartate (NMDA) receptor antibodies. We recommend that fertility preservation should be discussed and stress management should be considered in patients with a history of anti-NMDA autoimmune encephalitis because this can help in preventing relapse.

KEYWORDS Fertility preservation in NMDA encephalitis; NMDA receptor encephalitis; *N*-methyl-D-aspartate receptor encephalitis

CASE PRESENTATION

A previously healthy 22-year-old woman presented with disorganized behaviors, restlessness, and subacute decline in mental status. She had stressors 3 days before initial change in behavior, such as infidelity with her significant other, and she had tremendous anxiety and guilt regarding the incident. Her behavior continued to decline during admission. Four days after admission, the patient developed repetitive left hand motions, visual and auditory hallucinations, and echolalia. Her initial laboratory results including cerebrospinal fluid analysis were unremarkable. Other infectious workup including syphilis, herpes simplex virus, *Cryptococcus*, West Nile virus, and Lyme were negative. Magnetic resonance imaging of the head was unremarkable. She was found to have a right ovarian dermoid cyst on ultrasound. Electroencephalography disclosed diffuse 1- to 3-Hz delta wave activity with superimposed bursts of rhythmic 20- to 30-Hz beta frequency activity. Extensive workup for autoimmune diseases was done and found to be positive for anti-*N*-methyl-D-aspartate (NMDA) receptor antibodies. The patient underwent laparoscopic right oophorectomy for ovarian teratoma. Surgical pathological examination demonstrated mature cystic teratoma. The patient began treatment with methylprednisolone and intravenous immunoglobulin the day following surgery. Due

to lack of improvement following tumor resection and corticosteroid and intravenous immunoglobulin therapy, rituximab was administered to our patient along with the initiation of plasma exchange. The patient subsequently improved after weeks of treatment and was discharged after about 2 months of hospital stay.

DISCUSSION

NMDA receptor antibody encephalitis is a classic example of antibody-mediated paraneoplastic encephalitis commonly associated with ovarian teratoma.¹ It should be considered in patients presenting with acute or subacute onset psychiatric symptoms who develop movement or autonomic disorder. Delta brush is a pattern on electroencephalography that can be observed in some of the patients with anti-NMDA receptor encephalitis; however, it is not a constant feature.²

Most patients with anti-NMDA receptor encephalitis respond to first-line immunotherapies such as steroids, intravenous immunoglobulin, and plasmapheresis. Second-line immunotherapy like rituximab is usually effective when first-line treatments fail.³ Our patient failed first-line treatment; as a result, rituximab was initiated with improvement.

There are cases describing nonspecific prodromal symptoms or infectious triggers for immunological response

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Received April 13, 2019; Revised July 16, 2019; Accepted July 22, 2019.

leading to immune dysregulation in patients with autoimmune diseases. We presume that our patient's emotional stress triggered immune dysregulation, which ultimately resulted in anti-NMDA encephalitis. Follow-up treatment of patients should include stress management and behavioral intervention to prevent stress-induced immune dysregulation because this could play a role in preventing relapse.

Screening for anti-NMDA receptor encephalitis should be considered in patients presenting with acute or subacute onset psychiatric symptoms who develop neurologic or autonomic disorder. Fertility preservation should be discussed with women of reproductive age diagnosed with anti-NMDA receptor encephalitis. Stress management may prevent relapse.

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