Case Report

ANTI-N-METHYL-D-ASPARTATE RECEPTOR ENCEPHALITIS IN A CHILD

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ABSTRACT

Background: *Anti-N-methyl-D-aspartate receptor encephalitis is a rare autoimmune disease characterized by severe neurological and psychiatric symptoms and difficult to diagnose. We report a case of Anti-N-methyl-D-aspartate receptor encephalitis diagnosed at the Pediatric Center of Hue Central Hospital.*

Case report: *A 3½ - year - old girl with previously normal psychomotor development developed behavioral problems and speech impairment 2 week ago. From the onset of symptoms, choreic movements gradually appeared. Hematological, neuroradiological, and neurological examinations were negative; however, her symptoms worsened and treatment with methylprednisone was started. Although her choreic movements improved, her neuropsychological and behavioral symptoms still continued. Anti-N-methyl-D-spartate receptor antibodies in cerebrospinal fluid were detected. The second dose of methylprednisone and then immunoglobulins was administered. After several weeks of treatment, she was well recovered with a progressive improvement in language and behavior.*

Conclusions: *Anti-N-methyl-D-aspartate receptor encephalitis in pediatric patients can present initially with neuropsychological and behavioral symptoms.*

Keywords: *Anti-N-methyl-D-aspartate receptor, encephalitis, choreic movement.*

I. INTRODUCTION

Anti-N-methyl-D-aspartate receptor (NMDAR) encephalitis is a recently described disease with five stages of development (prodromal phase, psychotic phase, unresponsive phase, hyperkinetic phase, and progressive recovery phase), including mental symptoms in adults and neurological abnormalities in children [1]. NMDAR encephalitis is becoming identified more frequently in the pediatric population, following the first report of pediatric anti - NMDAR encephalitis in China in 2010. After mixed disturbance encephalitis, it is the second most common etiology after acute demyelinating encephalitis, surpassing all viral etiologies for encephalitis [2,3].

Behavioral changes, psychosis, seizures, oro - lingual - facial dyskinesia, excessive irritability, and sleeplessness are common symptoms. The symptoms are persistent, and the illness normally progresses over a period of 4 to 8 weeks [4 - 6]. NMDA receptor encephalitis is commonly confused with schizophrenia. Anti - NMDAR antibodies are used to make the diagnosis because neuroimaging and electroencephalography (EEG) are nonspecific. In youngsters, an atypical presentation of the condition might cause a delay in identification and treatment [1].

Here, we report a case of Anti-N-methyl-D-

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aspartate receptor encephalitis who was diagnosed at the Pediatric Centerof Hue Central Hospital.

II. CASE REPORT

A 3½ - year - old girl with previously normal psychomotor development developed behavioral problems speech impairment 2 week ago. From the onset of symptoms, choreic movements gradually appeared. She hardly slept and usually shouted in the evening. Neurological examination did not found any abnormalities.

Complete blood count, liver and renal function tests, and inflammation and infection markers were in the normal range.A lumbar puncture was then performed because we suspected a diagnosis of encephalitis. A cerebrospinal fluid (CSF) examination showed a slight elevated cells (25 cells/ mm3), however, CSF glucose and proteins levels were within normal ranger. A computed tomography (CT) scan of her brain showed normal results.

The patient was diagnosed with autoimmune encephalitis and treated with methylprednisolone in 5 days. Symptomatic treatment with haloperidol, clonazepam and valproate, then, her neuropsychological symptoms were gradually improved. Her choreic movements started to reduced.

The second puncture was then performed. CSF glucose and proteins levels were within normal range and no cells were found. Also, a sample of CSF was sent to Ho Chi Minh city for Anti - NMDAR antibodies test. Diagnostic testing including magnetic resonance imaging (MRI) of her brain, electrocardiogram (EKG), echocardiography, and EEG were all normal.

The patient was discharged for waiting for anti - NMDAR antibodies test returning.Three week later, the laboratoryreport showed a posive results with anti - NMDAR antibodies.

Based on these findings, a diagnosis of anti-N-methyl-D-aspartate receptor encephalitis was finally established. Although her choreic movements improved, her neuropsychological and behavioral symptoms still continued, she was administered with the second dose of methylprednisone and then immunoglobulins. After several weeks of treatment, she was well recovered with a progressive improvement in language and behavior.

III. DISCUSSION

Antibodies to the NR1 subunit of the NMDAR induce anti - NMDAR encephalitis, which is the second most common autoimmune encephalitis in children after acute demyelinating encephalomyelitis [7]. The encephalitis is linked to the formation of autoantibodies against NMDAR, a protein important in synaptic learning and memory. The antibodies of the patients have harmful effects on the NMDAR.

The presence of neurological and psychiatric symptoms characterizes anti - NMDAR encephalitis. At the outset of the condition in youngsters, isolated psychiatric symptoms are uncommon. They're more common in adults, even common during relapses [5]. Patients experience neurological and/ or psychological effects as a result of their treatment. Two to four weeks following the illness's prodromal stage (usually upper respiratory tract symptoms, fever, nausea, headache, vomiting, or diarrhea) [4, 8]. Anxiety, delusional thinking, mania, paranoia, and visual and auditory hallucinations are common mental symptoms in adults and adolescents. Insomnia, in particular, is a prevalent sleep problem. Children, on the other hand, are more likely to exhibit irritability, inappropriate laughing or weeping, hyperactivity, temper tantrums, and violent behaviors, as well as insomnia and anxiety. Initial symptoms in children aged 12 and under are frequently neurological, including dystonia, dyskinesia, and/or seizures (usually partial seizures) [4].

Our patient presented with neuropsychological and behavioral symptoms for 2 weeks before admission to hospital. Although lacking of anti - NMDAR antibodies test, the patient was initiallydiagnosed with autoimmune encephalitis based on clinical manifestations and CSF findings. Furthermore, we ruled out all other possible causes such as acute bacterial/viral meningitis, infectious encephalitis or even brain tumors.

In the 32 patients described by Florance et al. [5], movement disorders and seizures were found in 84% and 77% of the participants, respectively, while behavioral/personality abnormalities were found in 59 percent. Another study found that 67 percent of individuals under the age of 12 had neurologic symptoms and 33 percent had psychiatric symptoms at first [9].

In 90% to 100% of patients, the EEG is abnormal at the outset or during the course of the condition [10]. MRI has a lesser sensitivity, with positive results in 30% to 55% of cases [8].

In their pediatric series of 20 cases, Armangue et al. [4] Behavioral dysfunctions, sleep dysfunction, memory deficit, speech dysfunction, movement problem, seizures, loss of consciousness, autonomic dysfunction, and central hypoventilation were all classified as anti - NMDAR encephalitis symptoms. They discovered that each patient experienced a median of 5.5 symptoms in the first month of the condition (range 4 to 8). Over the course of the illness, psychiatric dysfunction, impaired speech, and aberrant movements (typically orofacial dyskinesia and choreoathetosis) appeared at various times

Many patients with acute psychosis are first seen by psychiatrists: pediatricians and psychiatrists should examine anti - NMDAR encephalitis as a possible cause of acute psychosis in children and adolescents who have no prior psychiatric history [7, 10].

An accurate follow-up in our patient is required to rule out an occult neoplasm; the diagnostic pattern must involve imaging with neoplastic biomarkers (such as CA 125 and CA 19.9) to identify the most prevalent tumor: Teratoma of the ovary [12].

The presence of additional autoimmune illnesses could aid doctors in their diagnosis.

Finally, while it is known that symptoms respond to immunomodulatory therapy with corticosteroids and immunoglobulins after a long period of time, it is unclear whether early treatment could speed up cognitive and neurological recovery.

IV. CONCLUSION

Anti - NMDAR encephalitis should be considered as a differential diagnosis in a young child presenting mostly with psychiatric symptoms in the absence of neurological symptoms and a negative EEG. Initiating appropriate treatment as soon as possible may result in the best possible outcome.

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