



## Neuromyelitis Optica Spectrum Disorder: A Rare Case Study

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### ABSTRACT:

Neuromyelitis Optica Spectrum Disorder (NMOSD) is an uncommon autoimmune neurological condition affecting the spinal cord and optic nerves. It is distinct from multiple sclerosis (MS) and primarily impacts women in their 30s and 40s, with higher prevalence in certain ethnic groups. The disease is characterized by specific autoantibodies targeting the aquaporin-4 (AQP4) water channel, leading to inflammation and central nervous system damage. Common clinical features include recurrent optic neuritis, transverse myelitis, and additional neurological symptoms like nausea and uncontrollable hiccups. Accurate diagnosis involves a comprehensive assessment, including clinical characteristics, neuroimaging, cerebrospinal fluid investigation, and AQP4 antibody detection. A multidisciplinary approach is crucial for effective management, with disease-modifying treatments, such as immunosuppressants and B cell-targeting monoclonal antibodies, showing promise in reducing recurrence rates and improving long-term outcomes. This abstract presents the case of an 18-year-old female diagnosed with NMOSD with hemiparesis, highlighting her clinical presentation and prescribed drug therapy for pain relief and disease management. Regular follow-up visits are essential to monitor treatment efficacy and overall neurological status.

### Introduction:

An uncommon autoimmune neurological condition known as Neuromyelitis Optica Spectrum Disorder (NMOSD) primarily affects the spinal cord and optic nerves. It was first identified by Eugene Devic in 1894 and differs from multiple sclerosis (MS) in terms of pathophysiology and diagnostic standards. NMOSD primarily affects women in their 30s and 40s, with increased frequency in specific ethnic groups [1]. Specific autoantibodies that target the aquaporin-4 (AQP4) water channel are a defining characteristic of NMOSD and cause inflammatory processes and damage to the central nervous system [2] [3]. Optic neuritis and transverse myelitis recurrence are both common clinical manifestations. There may also be additional neurological symptoms, such as nausea and uncontrollable hiccups [4]. The International Panel for NMO Diagnosis's precise diagnostic criteria are used in conjunction with a thorough review of clinical characteristics, neuroimaging, cerebrospinal fluid investigation, and the detection of AQP4 antibodies to arrive at a diagnosis [5]. A multidisciplinary approach to management is necessary, and disease-modifying treatments including immunosuppressants and monoclonal antibodies that target B cells have been shown to lower recurrence rates and enhance long-term results [6].

### Case Presentation

An 18-year-old female patient was admitted to the general medicine department with complaints of weakness in her left lower and upper limbs, increased sleepiness, and difficulty in raising from a sitting position. She had a prior medical history of decreased vision in her right eye, abdominal pain, and giddiness. Upon investigation, the patient tested positive for aquaporin 4 Abs, leading to a diagnosis of Neuromyelitis Optica Spectrum Disorder (NMOSD). Clinical examination revealed a conscious and coherent patient with vital signs showing blood pressure at 100/60 mmHg and a pulse rate of 90 beats per minute. There were no signs of neck stiffness in the central nervous system (CNS), and heart sounds S1 and S2 were positive in the cardiovascular system (CVS). Respiratory system examination indicated breath sounds to be bilaterally equal (BAE) and positive. Contrast MRI of the brain and whole spine screening revealed Schmoris nodes at the superior end plate of the L2 vertebra. However, the abdominal ultrasound scan showed normal results. With the diagnosis of NMOSD with hemiparesis, the patient was prescribed the following drug therapy: Tab Diclofenac 50 mg for pain relief, Inj. Pantop 40 mg to prevent gastric irritation, Inj. Rituximab 500mg/50ml to target B cells and manage the NMOSD, Tab. Pregabalin 75mg to alleviate neuropathic pain and improve sleep quality, and Tab. Paracetamol 500mg for mild pain relief and fever reduction. The patient's condition will be closely monitored, and regular follow-up visits will be conducted to assess treatment effectiveness and overall neurological status.

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**Discussion:**

The presented abstract provides an overview of Neuromyelitis Optica Spectrum Disorder (NMOSD), an uncommon autoimmune neurological condition characterized by spinal cord and optic nerve involvement. NMOSD differs from multiple sclerosis (MS) and predominantly affects women in their 30s and 40s, with varying prevalence among specific ethnic groups [1]. The disease is defined by the presence of specific autoantibodies targeting the aquaporin-4 (AQP4) water channel, which leads to inflammation and damage in the central nervous system [2] [3]. Clinical manifestations of NMOSD encompass recurrent optic neuritis and transverse myelitis, often accompanied by other neurological symptoms like nausea and uncontrollable hiccups [4]. A comprehensive diagnostic process involves evaluating clinical features, neuroimaging, cerebrospinal fluid analysis, and the detection of AQP4 antibodies to accurately diagnose the disorder [5]. To manage NMOSD effectively, a multidisciplinary approach is essential. Disease-modifying treatments, such as immunosuppressants and monoclonal antibodies targeting B cells, have demonstrated promising outcomes in reducing recurrence rates and improving long-term results [6]. The case presentation involves an 18-year-old female with NMOSD and hemiparesis. She presented with weakness in the left lower and upper limbs, increased sleepiness, and difficulty in rising from a sitting position. Previous medical history included decreased vision in the right eye, abdominal pain, and giddiness. The diagnosis of NMOSD was confirmed based on positive aquaporin 4 Abs. The patient's condition was managed using a combination of medications, including Diclofenac for pain relief, Pantoprazole to prevent gastric irritation, Rituximab to target B cells and manage NMOSD, Pregabalin for neuropathic pain relief and improved sleep quality, and Paracetamol for mild pain relief and fever reduction.

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**Conclusion:**

Neuromyelitis Optica Spectrum Disorder (NMOSD) is an autoimmune neurological condition that primarily affects the spinal cord and optic nerves. It differs from multiple sclerosis (MS) and primarily impacts women in their 30s and 40s, with varying prevalence among different ethnic groups. The disease is characterized by specific autoantibodies targeting the aquaporin-4 (AQP4) water channel, resulting in central nervous system inflammation and damage. Recurrent optic neuritis, transverse myelitis, and additional neurological symptoms are common clinical features. A comprehensive diagnostic approach involving clinical evaluation, neuroimaging, cerebrospinal fluid analysis, and AQP4 antibody detection is necessary for accurate diagnosis. The management of NMOSD requires a multidisciplinary approach, and disease-modifying treatments, including immunosuppressants and B cell-targeting monoclonal antibodies, have shown promise in improving long-term outcomes. The case presentation highlights the importance of personalized drug therapy and regular follow-up visits to assess treatment effectiveness and overall neurological status.

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