Neuromyelitis Optica Spectrum Disorder **(NMOSD)**

THE Sumaira FOUNDATION

Imagine My Life with NMO

What is NMOSD?

NMOSD is a unifying term for neuromyelitis optica (commonly referred to as NMO) and related syndromes (often including MOG-AD where it is not identified separately). NMOSD is a rare, severe, relapsing, neuroinflammatory autoimmune disease that attacks the optic nerve, spinal cord, brain and brainstem. It can result in blindness, paralysis, incontinence and death[1,2]. While precise estimates are not available, there are as many as 300,000 patients living with NMOSD broadly defined worldwide [1,2].

NMOSD in Europe

- NMOSD affects over 10,000 people in Europe and is likely under-diagnosed [3].
- The disease is most commonly diagnosed in women in their 30s and 40s. The estimated ratio of female-to-male patients is 9:1 [3].
- Higher rates have been reported in countries with a higher proportion of individuals of non-White ancestry [4,5].
- Despite availability of diagnostic tests for NMOSD, it is frequently misdiagnosed as multiple sclerosis [6].
- Lack of NMOSD awareness, especially among emergency clinicians and primary care providers, is a critical unmet need [3].
- Unfortunately, across Europe, there is a shortage of neurologists who specialise in inflammatory demyelinating autoimmune conditions [3].
- Like most rare disease treatments, those for NMOSD can be costly. The European Commission's approval of new therapies does not guarantee patients can access them [3].

Symptoms of NMOSD [7]

Symptoms of NMOSD can vary from person to person in duration and severity, including the level of resulting disability. Generally, NMOSD symptoms begin rapidly. After the initial attack, NMOSD follows an unpredictable course. Recurring episodes of optic neuritis (ON) and/or transverse myelitis (TM) can be weeks to months in duration, and in some rare cases, can last years. Usually, these symptoms are temporary and resolve fully or partially with treatment. A growing understanding of NMOSD suggests that the symptoms experienced depend on which antibody (AQP4-IgG or MOG-IgG) is found in the individual:

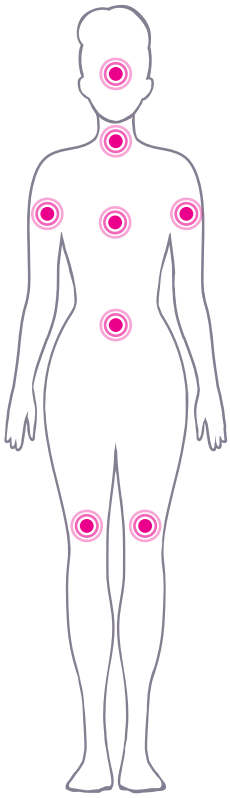
NMOSD is characterized by unpredictable attacks and severe disability that often occurs following the first attack, accumulating with each subsequent relapse. Preventing these attacks is the primary goal for disease management.

Signs and symptoms of optic neuritis (ON) may include:

- Rapid onset of eye pain or "eye headache" that is worsened by eye movement
- Impaired or complete loss of vision, usually in one eye, but in some cases in both eyes
- Reduced light perception, colour vision, visual clarity, and/or depth perception

Signs and symptoms of transverse myelitis (TM) include:

- Pain in the neck or back
- Tightness or corset-like sensations in the abdomen/chest, as well as arms or legs
- Sensitivity to touch, cold and heat
- Feeling of numbness, tingling, coldness, itching or burning, often spreading to large parts of the body over a period of minutes, hours or occasionally days
- Weakness in arms and/or legs ranging from mild to complete paralysis in one or multiple limbs
- Urgent need to urinate or difficulty urinating; urinary incontinence (unintentional passing of urine)
- Constipation, abdominal bloating, pain and inability to pass stool or gas; or bowel incontinence (unintentional passing of stools)
- Extreme nausea, sometimes accompanied by vomiting, and/or violent/persistent hiccuping
- Muscle spasms that may last for several minutes accompanied by arm and/or leg pain
- Fever in some cases



Diagnosis

TESTING
AQP4 antibody blood test
Magnetic Resonance Imaging (MRI)
Optical Coherence Tomography (OCT)
Visual Field Test (VFT)
Lumbar puncture (spinal tap)
Neurological exams

Treatment and management [8]

At present, there is no known cure for NMO. Treatment is directed at different goals, including treating acute attacks/relapses, preventing relapses, and treating the residual symptoms after relapse.

- For treating relapses: A high dose of IV steroid, methylprednisolone (Solu-Medrol), is usually given during a relapse. Steroids work to reduce inflammation. If steroids don't help, plasmapheresis (PLEX) is most frequently used. Plasmapheresis (PLEX) is a procedure in which the blood is drawn out of the body and the plasma (which contains the antibodies) is separated. The blood is then returned back into the body without the plasma that contains the antibodies. Intravenous immunoglobulin therapy (IVIG) may be given as well.
- For preventing relapses: Immune modulators are medicines that diminish the activity of the body's immune system and they may be used for long-term management of NMOSD. Drugs such as prednisone, azathioprine, methotrexate, mycophenolate and rituximab are used to allow the reduction of steroids. All of these treatments increase the risk of serious infections. Therefore, the patient will be closely monitored via blood tests, including for immune, kidney and liver function.

Relationship to MS

NMOSD and MS, while similar in the presentation of symptoms, are often confused but are separate diseases and must be treated in different ways. Early detection and treatment help ensure the best outcomes for both conditions. Differential diagnosis of NMOSD and MS is important because MS treatments may be ineffective or may even exacerbate NMOSD and harm the patient [9,10].

Until recently, NMOSD was regarded as an optic-spinal form of MS. Although the clinical manifestation of NMOSD may resemble MS, the NMOSD-specific serum autoantibody (AQP4-IgG) can be detected in up to 80% of patients [8], confirming it as a distinct clinical entity to MS. Patients are often also tested for myelin oligodendrocyte glycoprotein antibodies (MOG-IgG), the presence of which confirms diagnosis of MOG-AD. Despite this, **41% of NMOSD patients have reported an initial misdiagnosis of MS [11,12].**

Several factors differentiate NMOSD from MS

NMOSD	MS
Key symptom: severe vision impairment.	Key symptom: cognitive and psychological symptoms (e.g., memory loss or depression).
Severe acute episodes can lead to permanent disability.	Progressive disability caused by individual, typically mild, episodes.
Permanent CNS damage.	Often experience better recovery from attacks.
AQP4 antibody seropositive*	AQp4 antibody seronegative.

*80% of people with NMOSD are AQP4 antibody seropositive, but people with MS are always seronegative [20]

For further information go to: **www.sumairafoundation.org/resources/**

References

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