

### Transcript Details

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## Understanding Antibody-Mediated Demyelinating Diseases: Key Differences From MS

### Announcer:

This is *NeuroFrontiers* on ReachMD. On this episode, Dr. Michael Levy will be discussing progression in Ab-mediated diseases beyond multiple sclerosis, or MS, which he spoke about at ECTRIMS 2025. Dr. Levy is an Associate Professor at Harvard Medical School working in the department of neurology at Brigham and Women's Hospital. Let's hear from him now.

### Dr. Levy:

An Ab-mediated disease, or an antibody-mediated disease, is intended to refer to conditions where an antibody is involved or is associated with the disease. And in the world of demyelinating disease, there are two main ones: neuromyelitis optica, associated with the aquaporin-4 antibody, and MOG antibody disease, associated with the MOG antibody.

And we call them antibody-mediated disease because we think the antibodies mediate or are involved in the pathogenesis. That may or may not be the case. There are a lot of research studies in animal models suggesting they're involved but maybe don't mediate the disease. There's certainly a lot more mediating the disease upstream as far as the cellular immune system and other innate partners that all contribute to the inflammatory response, but in general, that's how we refer to them.

They differ from MS because multiple sclerosis is not known to be associated with an antibody. And MS is really thought to be a whole different immune process compared to the antibody-mediated diseases, which have a lot of commonalities in that there's a known immune response against a specific target in the central nervous system.

Progression in all of these conditions can be defined as anything that makes the patient worse, and you could think about that biologically as far as inflammation going on; you may not even see it or be able to detect it, but progression in the inflammatory process means that inflammation is going to get worse, and it's about to cause neurological damage. Then that would manifest in the patient having symptoms, so they'll come to you and they'll say, "There's something wrong. I feel like I'm getting worse." And then the doctor runs a bunch of tests—an MRI and blood tests and other things that could provide objective evidence of progression.

And probably the most common, easy to recognize progressive condition in antibody-mediated diseases is a relapse, and a relapse is an event. It's when the immune system attacks the nervous system. Biologically, we know what's happening upstream. We know the T cells and the B cells are talking and communicating and antibodies are involved. And then the attack occurs, and the patient feels it, and there's swelling and inflammation in the optic nerve or the spinal cord. And then the doctors can do the MRI, and they'll see the inflammation on the MRI. So that's the easiest way to be able to detect progression in these conditions, and it's what directly leads to the dysfunction.

Then there's some treatment and a healing process, and then patients level out. They may achieve a new baseline of disability where maybe they didn't quite recover everything that they had before the relapse, and in some conditions and some relapses, they may recover all the way back to baseline. And then there's a period of remission, and during that time in these antibody-mediated diseases, we don't see a lot of progression. There's nothing else going on. There's no burning, smoldering disease going on in the central nervous system like there might be in MS. In these other conditions, it's really quiet in the central nervous system until the next attack.

And then even within the conditions that are not included in MS, so NMOSD and MOG, there's differences in long-term disability and progression for these patients. NMO tends to be really flat. But in MOG, it seems people do get better over time. It's one of the few conditions where we see a damage in the central nervous system that actually heals over time, and if we can prevent relapses, those patients may actually get better. But that's unique to MOG.

I would say that the most important key takeaway, especially from antibody-mediated diseases, is that if you stop relapses, patients either get better or they never do worse, and the outcomes are always much, much better as long as you stop the relapses. And that really emphasizes the need to use preventive medicines.

**Announcer:**

That was Dr. Michael Levy discussing progression in Ab-mediated diseases beyond MS. To access this and other episodes in this series, visit *NeuroFrontiers* on ReachMD.com, where you can be part of the knowledge. Thanks for listening!