Transcript Details
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Improving Diagnostic Accuracy in MS: Criteria, Challenges, and Innovations

Announcer:
You're listening to *NeuroFrontiers* on ReachMD. On this episode, we'll discuss strategies to improve diagnostic accuracy in multiple sclerosis, or MS, with Dr. Andrew Solomon. He's the Professor and Interim Chair of the Department of Neurological Sciences and Chief of the Multiple Sclerosis Division at the University of Vermont, and he spoke on this topic at the 2025 American Academy of Neurology Annual Meeting. Let's hear from Dr. Solomon now.

Dr. Solomon:
The MS diagnostic criteria has evolved quite a bit over time, but it's always specified that in order to use the criteria, we need to identify patients who have syndromes we consider typical for MS. We usually think of these as either attacks, or what we call relapses, or exacerbations. And some of those syndromes include optic neuritis or myelitis, or particular brain stem syndromes, and some patients present with a progressive phenotype where they have a gradual worsening of motor impairment over a year or longer. While we're looking for these typical syndromes, we need to make sure there's evidence of a central nervous system lesion that's corresponding to the symptoms, so that's this concept of objective evidence that's been part of all of our diagnostic criteria over time. So either a neurologic examination or by MRI, or perhaps, if we're looking at the optic nerve, OCT or visual evoked potentials. We need to confirm our suspicion that there is a lesion. So first, we need to identify syndromes that we think might be something like optic neuritis or myelitis, and then we need to find some evidence of a lesion that caused that syndrome.

As part of the diagnostic process, we need to be aware of a variety of red flags that could suggest that something about that syndrome is atypical for MS. There's a long list of disorders that can mimic MS, of course, and some of them are quite rare and can be quite challenging to identify. But the key here is that if we know what's classic for MS and what's typical, then we can recognize what might be unusual and start to think about other diagnoses. That's just the first step.

What we've noticed is that a lot of the disorders that seem to be most frequently reported as mistaken for MS are very common syndromes like migraine or functional neurologic disorder that are frequently referred for MS evaluation, but are disorders that any neurologist, including non-MS specialists and non-subspecialists, should be able to identify. The fact that we see a lot of common disorders mistaken for MS suggests that there's a problem in the diagnostic process and that perhaps there's unfamiliarity or misunderstanding of our diagnostic criteria or the diagnostic criteria isn't being used stringently enough.

I think part of the problem is there's this tension between wanting to treat patients as early as possible so they have the best outcomes and having patients where you have abnormalities on an MRI and some neurologic symptoms that are difficult to untangle and wanting to make a diagnosis as quick as possible. But in some of those patients, further evaluation or waiting a bit and getting interval imaging sometimes may reveal a more accurate diagnosis that's not MS.

Thinking about the future, we've had a lot of attempts that have come and gone to find a blood test for MS. A lot of those biomarkers have not worked out. We've had some promising biomarkers, but then we couldn't replicate them, and there's probably a variety of reasons for that. The immune response in MS is quite complex, but what we do have is an increased understanding of the pathobiology of MS, and we're seeing that we can visualize a lot of this on MRI now better than we used to.

These biomarkers can differentiate MS from other disorders really well, and one of them is called the central vein sign, where we see a vein in the center of T2 hyperintense lesions on MRIs in patients with MS. And most lesions in MS have these veins in the center, and so there have been a number of studies that have looked at counting the number of these lesions with veins that you can visualize and

how specific it is for MS. And this will be incorporated in our new diagnostic criteria, and I think automated techniques for doing this are coming. They're being developed. Similarly, there's something called paramagnetic rim lesions that represent activated microglia around MS lesions.

Both of these seem like really promising biomarkers that we will be using as part of our new diagnostic criteria and both have automated or machine learning techniques that are evolving such that in the future, we might get an MRI report that says this MRI has X number of central veins in the white matter lesions that are identified, or paramagnetic rim lesions. I think we're headed in that direction, so that's pretty exciting.

Announcer:
That was Dr. Andrew Solomon discussing how we can improve diagnostic accuracy in multiple sclerosis. To access this and other episodes in our series, visit *NeuroFrontiers* on ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening!