

Blood test might someday diagnose early MS

April 27 2024, by Dennis Thompson



An early marker of multiple sclerosis could help doctors figure out who will eventually fall prey to the degenerative nerve disease, a new study says.

In one in 10 cases of MS, the body begins producing a distinctive set of

antibodies in the blood years before symptoms start appearing, researchers reported April 19 in the journal [Nature Medicine](#).

This antibody pattern was 100% predictive of an MS diagnosis, researchers found. Every patient who carried this set of antibodies went on to develop MS.

Researchers hope these antibodies will someday form the basis of a simple blood test to screen for MS.

"Over the last few decades, there's been a move in the field to treat MS earlier and more aggressively with newer, more potent therapies," said senior researcher Dr. Michael Wilson, a neurologist with the University of California, San Francisco (UCSF).

"A diagnostic result like this makes such [early intervention](#) more likely, giving patients hope for a better life," Wilson added in a news release.

MS occurs when the body's own immune system attacks the central nervous system, damaging the protective sheath around nerve fibers called myelin. This disrupts signals to and from the brain, causing a variety of symptoms that impede the senses and impact the ability to move.

An autoimmune disease like MS is believed to result in part from rare immune reactions to common infections, researchers said.

For this study, researchers screened [blood samples](#) taken from 250 MS patients collected before and after their diagnosis, and compared them to the blood samples of healthy people.

All of the samples came from U.S. armed service members, who provide blood samples when they apply to join the military.

It was "a phenomenal cohort of individuals to look at to see how this kind of autoimmunity develops over the course of clinical onset of this disease," said lead researcher Colin Zamecnik, a postdoctoral researcher at UCSF.

The researchers thought they would see a jump in antibodies as the MS patients suffered their first symptoms of the disease.

Instead, they found that 10% of the MS patients had strikingly high levels of autoantibodies—antibodies that can attack the body itself—years before their diagnosis.

The dozen or so autoantibodies flagged by the researchers all stuck to a chemical pattern resembling one found in common viruses. These include Epstein-Barr virus, which infects more than 85% of all people and has been flagged in earlier studies as a potential contributing cause for MS.

Essentially, this 10% of MS patients showed signs of an immune war raging in the brain years before diagnosis, researchers said. These patients also had elevated levels of a protein that gets released as neurons break down.

To confirm their findings, researchers analyzed blood samples from patients in another study involving neurological symptoms. Once again, 10% of the patients diagnosed with MS had the same autoantibody pattern.

"Diagnosis is not always straightforward for MS, because we haven't had disease specific biomarkers," Wilson explained. "We're excited to have anything that can give more diagnostic certainty earlier on, to have a concrete discussion about whether to start treatment for each patient."

It's still not clear what causes MS in the other 90% of patients, but researchers believe they now have a definitive early warning sign that the disease is brewing.

"Imagine if we could diagnose MS before some patients reach the clinic," said senior researcher Dr. Stephen Hauser, director of the UCSF Weill Institute for Neurosciences. "It enhances our chances of moving from suppression to cure."

More information: Colin R. Zamecnik et al, An autoantibody signature predictive for multiple sclerosis, *Nature Medicine* (2024). [DOI: 10.1038/s41591-024-02938-3](https://doi.org/10.1038/s41591-024-02938-3)

The National MS Society has more on [multiple sclerosis](#).

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Citation: Blood test might someday diagnose early MS (2024, April 27) retrieved 13 May 2024 from <https://medicalxpress.com/news/2024-04-blood-early-ms.html>

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