Could a blood test revolutionize multiple sclerosis diagnosis?

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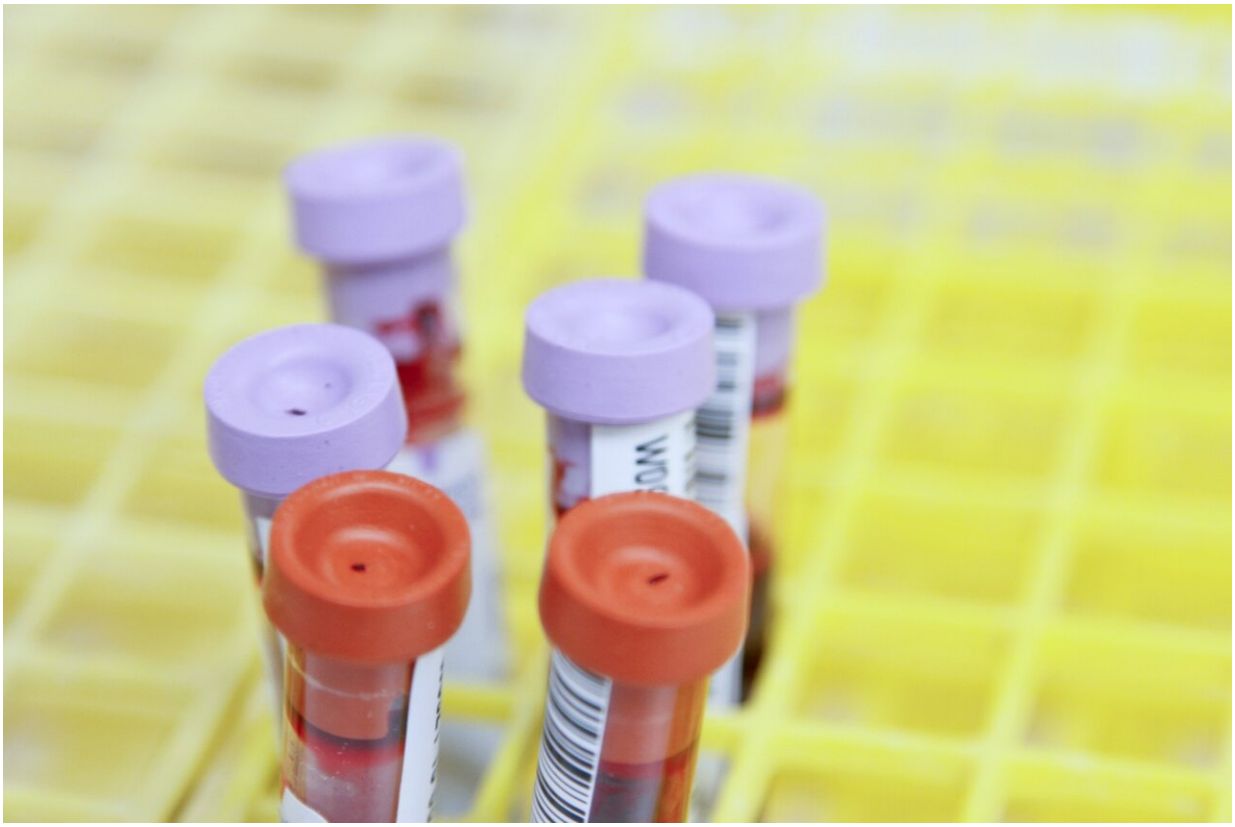

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A simple blood test into multiple sclerosis (MS) pathology could speed MS diagnostics and ultimately improve patient care, according to Xiaoli Yu, Ph.D., senior author of a new study on plasma immunoglobulin G

(IgG) antibody aggregates.

Yu's research team has identified a procedure that provides 90% sensitivity to MS biomarkers in plasma. The test's specificity offers a path to monitoring patient response to different therapies and could inform future treatment decisions, said Yu, an associate professor in the Department of Neurosurgery at the University of Colorado School of Medicine.

The blood-test study recently published in *Clinical Immunology* is a sister study to the team's discovery published in *Cell Death & Disease*—that MS-specific IgG in the blood forms into large aggregates that are toxic to neurons.

MS is an autoimmune disease that affects nearly 1 million people in the United States and 2.8 million worldwide. It has no cure and is characterized by neuronal loss and demyelination in the central nervous system. Yu said it is the most common disabling neurological disease of young adults with symptoms typically starting between the ages of 20 and 40.

'Simple process'

She said current MS diagnostic methods are complex and expensive. They include a neurological exam, MRI, or a spinal tap to look for IgG bands. Other markers, such as neurofilament light (NfL) and glial fibrillary acidic protein (GFAP), are being investigated extensively, but they are not specific to MS and require specialized instruments.

The blood test study shows, however, that it's possible to detect MS at early stages with strong accuracy, Yu said. "Ours is a simple process to analyze one drop of blood sample (50 ul), and any clinical lab can perform the test."

There are four forms of MS, but the most common are relapse-remitting (RRMS), which is the stage where most people are diagnosed with the disease, and secondary-progressive MS (SPMS), which is where patients develop steady symptoms.

Yu said the earlier MS can be detected, the better for the patient.

"We don't have very effective drugs for progressive MS, so if the disease can be caught earlier, the patient responds better, and their MS doesn't move to the progressive stage as quickly," she said. "(All forms of MS) need better treatment options."

More research needed

The plasma test, using enzyme-linked immunosorbent assays (ELISA), was conducted using samples from 190 people with MS and 160 control samples. Yu said more research is required before the assays can be adapted for clinical practice, but the accuracy of detecting the MS biomarkers fuels her hope for the viability of such a test in the future.

"Importantly, we also showed that you can make a prognosis for disease progression," she said. "We saw that SPMS patients had higher amounts of the antibodies—so there is a strong correlation (between antibody biomarkers and disease progression)."

More information: Wenbo Zhou et al, Plasma IgG aggregates as biomarkers for multiple sclerosis, *Clinical Immunology* (2023). DOI: 10.1016/j.clim.2023.109801

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