Blood test to detect alpha-synuclein protein could revolutionize Parkinson's disease diagnostics

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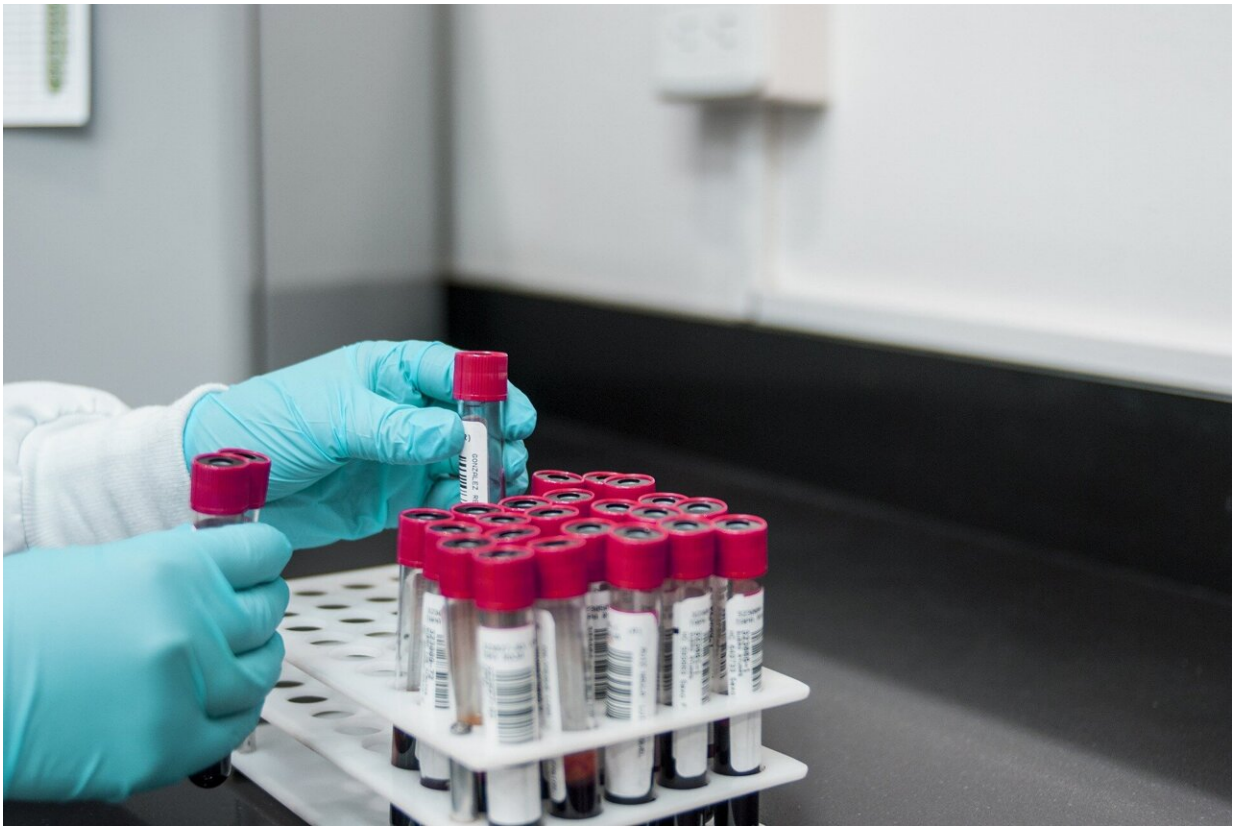

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To date, Parkinson's disease (PD) is diagnosed clinically and rather late in the course of the disease. There is an urgent need to find an objective,

quantifiable biomarker for the diagnosis of this highly prevalent movement disorder. Researchers have now found initial evidence that a blood test to detect the alpha-synuclein protein is a viable, less invasive option to diagnose PD. The study appears in the *Journal of Parkinson's Disease*.

Lead investigators Annika Kluge, MD, and Eva Schaeffer, MD, both of the Department of Neurology, University Hospital Schleswig-Holstein, Campus Kiel and Kiel University, Kiel, Germany, say, "In recent years, it has been shown that the pathophysiological highly relevant protein alpha-synuclein, which accumulates in nerve cells, can also be detected in different body fluids and tissues of individuals with PD, for example in the cerebrospinal fluid or in skin tissue."

In a previous publication this research team was able to show that alpha-synuclein can also be detected in the blood of PD patients by isolating small vesicles from neuronal cells (neuronal exosomes) from the blood and amplifying the alpha-synuclein they contain using a seed amplification assay (SAA).

Dr. Kluge adds, "With this current work we aimed to confirm that this blood test can detect alpha-synuclein in a larger group of individuals with PD and elucidate whether the amount of alpha-synuclein measured with the SAA changes during the course of the disease."

Researchers analyzed cross-sectional blood samples from PD patients and compared these to samples of age- and gender-matched healthy controls using a blood-based SAA. In this study, 79 of 80 PD patients showed a positive seeding of alpha-synuclein derived from blood, while none of the healthy controls showed a positive blood test. This confirms that the alpha-synuclein blood marker is highly sensitive for PD.

When comparing subgroups of PD patients with different disease

durations, longer disease duration was associated with lower alpha-synuclein seeding activity, showing that alpha-synuclein seeding activity changes over the course of the disease. It remains unclear whether--and if so, how--alpha-synuclein seeding activity changes during the natural course of the disease.

Dr. Schaeffer and Dr. Kluge conclude, "There is currently no blood test for PD available in clinical practice. It is of course of great importance that the strong results of our cross-sectional and longitudinal analyses are validated and replicated in different labs. If the decline in seeding activity in blood was confirmed, it may influence further studies and our understanding of disease progression. In the long term, it is hoped that this blood test can be used to improve the diagnostic security and reliability in PD, even at early stages during which clinical diagnosis is difficult. Moreover, the impact on clinical studies needs to be considered, especially regarding the potential of antibody-based targeted treatments for PD."

More information: Eva Schaeffer et al, Association of Misfolded α-Synuclein Derived from Neuronal Exosomes in Blood with Parkinson's Disease Diagnosis and Duration, *Journal of Parkinson's Disease* (2024). DOI: 10.3233/JPD-230390

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