Simple blood test could help predict progression of Parkinson's disease

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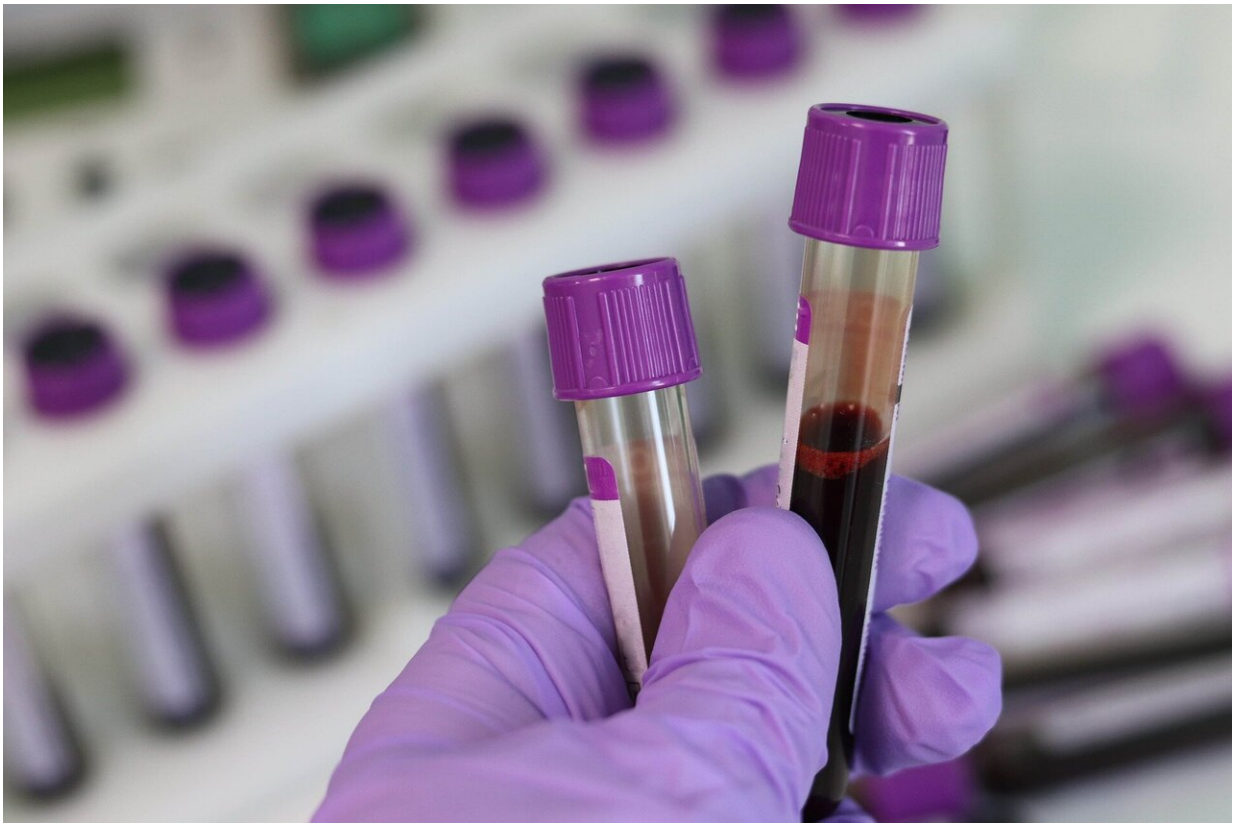

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In order to provide the best medical care for newly diagnosed Parkinson's disease (PD) patients, a method of predicting their cognitive and motor progression, beyond using purely clinical parameters, would

have major implications for their management. A novel study published in the *Journal of Parkinson's Disease* suggests that a blood test for inflammatory and cell senescence biomarkers may be a reliable predictor of cognitive decline, including identifying those who will develop an early dementia and motor progression in PD patients.

"The cumulative incidence of dementia associated with PD is approaching 80%, and individuals with PD are five to six times more likely to develop cognitive impairment than age-matched controls," explained lead investigator Gabriele Saretzki, Ph.D., Biosciences Institute, and The Ageing Biology Centre at the Campus for Ageing and Vitality of Newcastle University, Newcastle upon Tyne, UK. "PD is known to be associated with inflammation, and we have previously published data demonstrating that a more pro-inflammatory profile in the blood predicts more rapid clinical progression. In this new study, we sought to replicate this finding as well as to study markers of cell senescence (aging), a process that is known to be associated with inflammation and neurodegeneration."

Investigators examined the association of blood-derived markers with motor and cognitive function over time to discover if this could help to better predict disease progression of newly diagnosed PD patients. More than 150 newly diagnosed PD patients who participated in the Cognitive Impairments in Cohorts with Longitudinal Evaluation-Parkinson's Disease (ICICLE-PD) study and 99 controls underwent physical and cognitive assessments over 36 months of follow-up.

Researchers analyzed whether markers of cellular senescence such as telomere length (TL), p16 and p21 expression, as well as inflammatory markers in blood samples taken close to diagnosis can be predictive of cognitive and motor progression of the disease over the next 36 months. Mean leukocyte TL and the expression of senescence markers p21 and p16 were measured at two time points (baseline and 18 months).

Investigators also selected five inflammatory markers from existing baseline data.

The study demonstrated that PD patients had shorter telomeres at baseline and 18 months later compared to age-matched healthy controls. Those PD patients, who had developed dementia after three years, also had significantly shorter telomeres compared to individuals who were dementia-free at this time. Baseline p16 levels were associated with faster rates of motor and cognitive decline over 36 months, while a simple inflammatory summary score at baseline best predicted cognitive score 36 months later in PD patients.

"The development of suitable blood-based biomarkers to predict outcomes is important for neurodegenerative diseases such as PD, which progress over many years," noted Dr. Saretzki. "The markers that we have identified need to be validated in further studies but could ultimately help with planning more targeted management for patients earlier in their disease course. Furthermore, a better understanding of the biological changes that predict disease course has implications for possible future therapies for the disease."

Co-investigator Roger Barker, MBBS, MRCP, Ph.D., Professor of Clinical Neuroscience and Honorary Consultant in Neurology at the University of Cambridge, and at Addenbrooke's Hospital, Department of Clinical Neurosciences, John Van Geest Centre for Brain Repair, University of Cambridge, Cambridge, UK, added: "Being able to reliably predict the clinical path a patient with newly diagnosed PD will follow would greatly help in terms of planning their treatment now and in the way we do trials of disease-modifying interventions in the future. This study provides an example of how this could be done using a simple blood sample."

More information: Carmen Martin-Ruiz et al. Senescence and

Inflammatory Markers for Predicting Clinical Progression in Parkinson's Disease: The ICICLE-PD Study, *Journal of Parkinson's Disease* (2019). DOI: 10.3233/JPD-191724