

Personality trait neuroticism associated with higher risk of Parkinson's disease

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New research from the Florida State University College of Medicine has found that the personality trait neuroticism is consistently associated with a higher risk of developing the brain disorder Parkinson's disease.

The research by Professor of Geriatrics Antonio Terracciano and team, published in *Movement Disorders*, found that adults in the study who scored in the top quartile of neuroticism had more than 80% greater risk of Parkinson's, compared to those who scored lower on neuroticism.

Some clinicians think that the anxiety and depression is just the result of Parkinson's. However, our findings suggest that some emotional vulnerability is present early in life, years before the development of Parkinson's disease."

Antonio Terracciano, Professor of Geriatrics, Florida State University College of Medicine

The effects were similar for women and men and across socioeconomic strata. Furthermore, the association was virtually unchanged in models that excluded incident cases within the first five years of follow-up and remained significant in models that accounted for demographic variables and other risk factors, including smoking, physical activity, anxiety and depression.

Three similar studies have published results consistent with Terracciano's findings, but with smaller sample sizes. Collectively, they provide a "pretty robust and replicable" assessment of the link between neuroticism and Parkinson's, Terracciano said.

"It kind of gives you a better understanding of the risk factors for the disease and what could be a contributing cause," he said. "This is one of many [factors], but the evidence is convincing."

Globally, an estimated six million people suffer from Parkinson's disease -- about 1% of all older adults -- making it the second most common neurodegenerative disease after Alzheimer's. The causes of Parkinson's disease are not well understood, but scientists believe genetic and environmental factors contribute to its onset.

Neuroticism is a personality trait that measures individual differences in the tendency to experience negative emotions, vulnerability to stress, inability to resist urges and self-consciousness. It is one of the five major personality traits known as the "Big Five" or five-factor model of personality and is one of the most studied psychological dispositions for its relevance spanning normal to abnormal emotional functioning.

Neuroticism has been linked to mood disorders and Alzheimer's, but there have been fewer studies on its prospective connection with Parkinson's.

"Individuals who score high in neuroticism are at higher risk for poor health outcomes across the lifespan, particularly in the domain of mental health and neurodegenerative diseases, including Alzheimer's disease and related dementias," Terracciano said.

Central to Terracciano's research was a large-scale study by the UK Biobank, which recruited nearly a half-million individuals ages 40-69 between 2006 and 2010, and collected data obtained over nearly 12 years of follow up. A baseline assessment measured neuroticism. There were 1,142 identified cases of Parkinson's ascertained through UK National Health Service electronic health records or death records up to 2018.

"Anxiety and depression are comorbid with Parkinson's disease," Terracciano said. "Many people with Parkinson's tend to be anxious or tend to get depressed. Part of that could be due to the disease and how it alters the brain and can have an influence on emotions. Part could be a psychological reaction of having a diagnosis of the disease."

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Parkinson's is a long-term degenerative brain disorder that causes progressive decline of motor and physical functions. As the disease progresses, nerve cell damage in the brain causes dopamine levels to drop, leading to symptoms such as tremors, slow movement, stiffness and loss of balance. Dopamine is known as a "feel-good" hormone involved in reward, motivation, memory and attention in addition to regulating body movements.

Terracciano led the research team, which included Damaris Aschwanden, a post-doctoral researcher in the FSU Department of Geriatrics, and Angelina Sutin, professor in the FSU Department of Behavioral Sciences and Social Medicine. Researchers from the University of Montpellier in France; the National Research Council, Sant'Anna Institute and Tor Vergata University of Rome in Italy; and the University of Cambridge in the United Kingdom contributed to this study.

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