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UC team studies link between Parkinson's disease and depression

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A patient who receives a diagnosis of Parkinson's disease might become depressed, and understandably so. But does the depression then exacerbate the progression of Parkinson's?

That's one of the questions a team of University of Cincinnati researchers is studying, with the help of a $1.7 million grant from the National Institutes of Health (NIH).

Parkinson's disease is a degenerative neurological disorder involving the death of dopamine-producing cells, or neurons, deep within the brain. Depression is highly prevalent in Parkinson's disease, previous research has found.

Principal investigator Kim Seroogy, PhD, and co-investigator James Herman, PhD, are studying a stress-induced model of depression and Parkinson's in rodents. Seroogy is a professor of neurology and director of the Selma Schottenstein Harris Lab for Research in Parkinson's at the James J. and Joan A. Gardner Family Center for Parkinson's Disease and Movement Disorders. Herman is a professor of psychiatry and director of the university's neuroscience graduate program.

Parkinson's-induced rodents are stressed in a variety of ways, such as being placed briefly in a cold room or a crowded setting. In studying the results, the UC team hopes to gain insight into a problem Seroogy likens to the classic chicken-and-egg question: Which comes first, Parkinson's or depression?

"There are two schools of thought on co-morbidity of depression and Parkinson's," says Seroogy. "One is that the onset of depression precedes and possibly leads to Parkinson's. The other is that Parkinson's disease predisposes for depression. Clinically, there's evidence for both of those lines of thinking."

The NIH grant will enable the UC team to examine the question and, as Seroogy puts it, "have it surrounded."

"We're going to have some groups that undergo depression first, then the Parkinson's, and then we'll do the reverse," he says. "Then there will be some that are combined—depression, then parkinsonism, then further depression."

In pilot models so far, Seroogy and Herman have found that in those animals that have stress combined with Parkinson's, their normal loss of dopamine cells in the brain is accelerated. In addition, the movements of their impaired limbs also worsened in the behaviors that were tested.

"So stress-induced depression exacerbates problems with movement, and also causes the relevant brain cells to die faster," Seroogy says.

Learning more about the relationship between depression and Parkinson's will provide insight into possible treatments of Parkinson's, Seroogy says.

"You might ask, 'Why don't we just prescribe antidepressants?'" he adds. "Well, we do. But there are no really definitive epidemiological studies or long-term assessments of the effects of antidepressants on the progression of Parkinson's."

Seroogy and Herman will explore that, plus the possibility that antidepressants can protect the brain from Parkinson's disease.

"Not only could they reduce depression, but they might actually protect dopamine cells in the brain and thus slow the progression of Parkinson's," says Seroogy.

Seroogy and Herman began their research into depression and Parkinson's with a $14,000 grant from the Sunflower Revolution Encore, a private fund-raiser hosted by Melody Sawyer Richardson in 2005. Two years later, they received a $50,000 grant from the Davis Phinney Foundation to continue their research, which was also supported in the interim by about $20,000 from the Parkinson's Disease Support Network of Ohio, Kentucky and Indiana.

"We're gratified that an investment in our research by the local community and the Davis Phinney Foundation has now led to a five-year NIH grant that will allow us to investigate how stress causes enhanced parkinsonian symptoms, and how to prevent stress from causing further damage to the parkinsonian brain," says Seroogy.

Source: University of Cincinnati