Resting tremor in focus in new Parkinson's study

June 10 2024

Credit: Pixabay/CC0 Public Domain

Murdoch University's Center for Healthy Aging is identifying new interventions to treat resting tremor in people with Parkinson's disease.

Tremor in Parkinson's disease differs from most other tremors as it occurs primarily when the person is at rest. It usually starts in the hand, foot or leg and affects up to 80% of people with the disease.

A study led by Associate Professor Ann-Maree Vallence and Murdoch University Ph.D. graduate Dr. Brittany Rurak investigated the connectivity between brain regions important for voluntary movement control in individuals with Parkinson's disease, both on and off dopamine medication.

The study, titled "Cortico-cortical connectivity is influenced by levodopa in tremor-dominant Parkinson's disease," is published in *Neurobiology of Disease*.

This was the first study to investigate connectivity between these motor areas in the brain using an advanced non-invasive brain stimulation technique called dual site transcranial magnetic simulation, in people with Parkinson's disease.

"Our study showed that when people with Parkinson's disease took levodopa, a dopamine medication, the connectivity between brain regions—the pathways for neural communication—was strengthened. And this strengthened connectivity was associated with the severity of their tremor symptom," Associate Professor Ann-Maree Vallence said.

"We looked at two key brain regions for movement—the supplementary motor area and the primary motor cortex.

"These regions communicate with each other to enable our skilled and controlled movements.

"Tremor, which involves involuntary and rhythmic movements, is the most common presenting motor symptom in Parkinson's and tremors

develop early in the disease.

"Levodopa medication is already commonly used in Parkinson's, but this research helps us to understand the neural connections altered by the medication, and how this relates to tremor. In the future, this could provide the evidence we need to develop new interventions."

Findings from the study suggest that levodopa medication alters the connectivity between the supplementary motor area and primary motor cortex.

The effect of this medication is that it allows the brain areas to communicate more freely.

"Once on the medication, there was an association between tremor severity and supplementary motor area and primary motor cortex connectivity, resulting in reduced tremors," Dr. Rurak said.

More information: B.K. Rurak et al, Cortico-cortical connectivity is influenced by levodopa in tremor-dominant Parkinson's disease, *Neurobiology of Disease* (2024). DOI: 10.1016/j.nbd.2024.106518

Provided by Murdoch University