Are Increased Lipid Levels an Early Sign of Parkinson's Disease?

A new study may help identify those at risk for the neurological disorder and lead to the development of early treatments.

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Tremors, muscle tension and changes in handwriting are just a few warning signs of Parkinson's disease (PD). Now, new findings published in Neurobiology of Aging suggest that a certain kind of fat accumulation in the brain may precede these signs as an indicator for the neurodegenerative disorder, reports McLean Hospital.

Researchers previously identified the relationship between PD risk and Gaucher disease, a common lysosomal storage disorder caused by mutations that lead to loss of function in the glucocerebrosidase (GBA) gene.

Those with this childhood disorder experience a severe decrease in the production of an enzyme that breaks down lipids (fat molecules). This, in turn, causes elevated levels of lipids inside cells, a condition that is almost always fatal. Individuals who carry only one copy of the defective GBA gene do not develop the illness but face a seven- to tenfold risk of developing PD later in life.

"This means that lipid accumulation may also be important in PD," concluded Ole Isacson, MD, PhD, codirector of the Neurogeneration Research Institute at McClean Hospital and a co–senior author of the study.

In the past, scientists at the hospital also identified increased amounts of a class of lipids known as glycosphingolipids in the midbrain of patients with PD. This led to a collaboration between McLean Hospital and the University of Oxford that involved measuring the levels of glycosphingolipids in the brains of aging mice. (Aging is an important risk factor for PD development.)

The lipids that increased in the brains of Parkinson's disease patients were also found to be elevated in the brains of aging mice. Scientists then concluded that both genetics (GBA gene mutation) and aging could contribute to the elevated levels of lipids in the brain that are characteristic of PD.

Researchers theorized that changes in lipids may cause a number of problems inside nerve cells in degenerative aging and Parkinson's disease that may precede some of the more obvious signs of

Parkinson’s disease, such as the formation of clusters of protein.

But the good news is that these findings may offer doctors a chance to address problematic lipid levels earlier in PD treatment and help identify patients who may be at risk for developing Parkinson’s disease.

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