



 Science Update

## New study shows n-acetyl-cysteine positively affects the dopaminergic system in Parkinson's disease

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Parkinson's disease is a debilitating neurodegenerative disorder that affects more than one million Americans each year, a figure expected to rise due to aging populations. The main characteristic feature of Parkinson's disease is the progressive destruction of dopamine-producing cells in the substantia nigra region of the brain where dopamine is made. This loss of dopamine production affects the communication between the brain and the body, causing muscle rigidity and tremors.

Present treatments for Parkinson's disease are limited to replacing dopamine in the brain as well as specific medications designed to slow the progression of the disease. Recently, researchers have demonstrated the role of oxidative stress and its impact on the brain in the Parkinson's disease process. This oxidative stress lowers glutathione levels, resulting in an increased demand for glutathione to help reduce the oxidative damage to the neurons.

According to a study published last month, researchers demonstrated that n-acetyl-cysteine (NAC), a precursor to glutathione, positively affects the dopaminergic system in Parkinson's disease patients, resulting in positive clinical effects.

In this study, patients with Parkinson's were divided into two groups. One group received a combination of oral and intravenous (IV) NAC for a three-month period. These patients received 50mg/kg NAC intravenously once per week and 500mg of oral NAC twice daily on the non-IV days. The other group received only their standard Parkinson's treatment. Patients were evaluated by standard clinical measures including the Unified Parkinson's Disease Rating Scale (UPDRS) and a brain scan (DaTscan SPECT imaging), which measures the amount of dopamine transporter in the basal ganglia. The patients receiving NAC had improvements of 4-9% in dopamine transporter binding as well as 14% in their UPDRS score.

The study showed that patients receiving NAC improved both mental and physical abilities with brain imaging studies that tracked the levels of dopamine. This demonstrates that NAC may have a unique physiological effect on the brain that alters the disease process and may improve the function of dopamine neurons, offering a new approach for managing patients with Parkinson's.

Glutathione is an important antioxidant which has been found to be depleted in the brain of Parkinson's disease patients. In addition, the extent of glutathione depletion appears to mirror the severity of the disease and is the earliest known indicator of degeneration. The brain has difficulty handling significant amounts of oxidative stress due to the presence of polyunsaturated fatty acids and low levels of antioxidants such as glutathione. In conclusion, providing antioxidant support with NAC or glutathione can provide a beneficial effect in Parkinson's patients as well as with other neurodegenerative disorders. Additional nutrients that may be beneficial include CoQ10, fish oil, vitamin B12, tyrosine, phytocannabinoids, and *Macuna pruriens*.

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Source: [Daniel A. Monti](#), [George Zabrecky](#), [Daniel Kremens](#), [Tsao-Wei Liang](#), [Nancy A. Wintering](#), [Anthony J. Bazzan](#), [Li Zhong](#), [Brendan K. Bowens](#), [Inna Chervoneva](#), [Charles Intenzo](#), [Andrew B. Newberg](#). [N-Acetyl Cysteine Is Associated With Dopaminergic Improvement in Parkinson's Disease. Clinical Pharmacology & Therapeutics, 2019; DOI: 10.1002/cpt.1548](#)

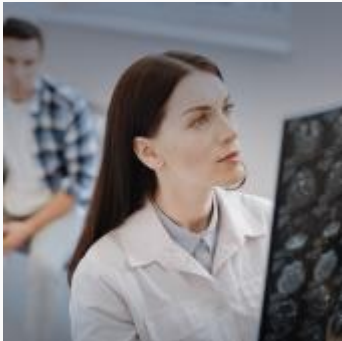
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