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A Note on Neurodegenerative Parkinson's Disease

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Description

Parkinson's disease is a nervous system disorder that causes difficulty with movement control. The disease usually starts slowly and progresses over time. It may have trouble speaking and sleeping, as well as mental and memory issues, behavioral changes, and other symptoms. Some people believe that some cases of early-onset Parkinson's disease (disease that begins before the age of 50) are inherited. Researchers discovered a gene mutation in Parkinson's disease patients whose brains contain Lewy bodies, which are clumps of the protein alpha-synuclein. Scientists are attempting to decipher the function of this protein and its relationship to genetic mutations seen in Parkinson's disease and a type of dementia known as Lewy body dementia. Several other gene mutations have been identified as being involved in Parkinson's disease. Mutations in these genes result in abnormal cell functioning, which reduces the ability of nerve cells to release dopamine and leads to nerve cell death. Researchers are still trying to figure out what causes these genes to mutate in order to better understand how gene mutations influence Parkinson's disease progression. Scientists believe that 10%-15% of people with Parkinson's disease have a genetic mutation that predisposes them to the disease's development. There are also environmental factors at work that aren't completely understood. Parkinson's disease develops when nerve cells (neurons) in the substantia nigra area of the brain become impaired or die. These cells normally produce dopamine; a chemical (neurotransmitter) that aids brain cell communication (transmits signals, or "messages," between brain areas). Dopamine production decreases when these nerve cells become damaged or die. Dopamine is especially important for the operation of the basal ganglia, which is another area of the brain. This region of the brain is in charge of organizing the brain's commands for movement. The movement symptoms seen in Parkinson's disease patients are caused by a lack of dopamine. Norepinephrine, another neurotransmitter lost in Parkinson's disease patients, is also lost. The sympathetic nervous system requires this chemical to function properly. Some autonomic functions of the body are controlled by this system, including digestion, heart rate, blood pressure, and breathing. Non-movement-related symptoms of Parkinson's disease are caused by a lack of norepinephrine. Despite the fact that there is no cure or definitive evidence of ways to prevent Parkinson's disease, scientists are working hard to learn more about the disease and find innovative ways to better manage it, prevent it from progressing, and eventually cure it. Currently, your efforts and those of your healthcare team are focused on medical management of your symptoms, as well as general health and lifestyle improvement recommendations (exercise, healthy eating, and improved sleep). Most people with Parkinson's disease can live fulfilling lives if they identify individual symptoms and adjust their course of action based on changes in symptoms. The future looks promising. Using stem cells (from bone marrow or embryos) to produce new neurons, which would produce dopamine, is one of the studies currently underway. Creating a dopamine-producing enzyme that is delivered to a movement-controlling gene in the brain. To protect dopamine-releasing nerve cells, researchers used a naturally occurring human protein called GDNF (Glial Cell-line Derived Neurotrophic factor).

Many other investigations are also underway. Much has been learned, much progress has been made, and more discoveries are almost certainly on the way.

Medications are the primary treatment method for Parkinson's disease patients. The doctor will work closely to develop the best treatment plan for you based on the severity of the disease at the time of diagnosis, the side effects of the drug class, and the success or failure of symptom control with the medications.

Medications combat Parkinson's disease by:

1. Assisting brain nerve cells in the production of dopamine.
2. Simulating the effects of dopamine in the brain.
3. By inhibiting an enzyme in the brain that breaks down dopamine.
4. Reducing symptoms of Parkinson's disease.