# Rush testing if genetic clues identify best candidates for Parkinson's surgery

September 1 2017

Rush Neurologist Gian Pal, MD, MS, the primary investigator for the National Institute of Health-funded clinical study Parkinson disease and DBS: cognitive effects in GBA mutation carriers. Credit: Rush Photo Group

In the first ever clinical investigation involving genetic screening for

Parkinson's disease, researchers are testing whether the presence of a specific genetic mutation identifies which patients are the best candidates for deep brain stimulation surgery, and whether neurologists should perform that procedure differently based on that genetic information.

"We are at a very promising time in Parkinson's disease (PD) research. Finding the connections between the vast amounts of genetic data and cognitive data we are gathering will allow us to tailor future therapies based on genetic biomarkers," said Rush neurologist Gian Pal, MD, MS, the primary investigator for the National Institute of Health-funded clinical study "Parkinson disease and DBS: cognitive effects in GBA mutation carriers"

Deep brain stimulation (DBS) is a surgical procedure in which a battery-operated medical device implanted in the brain delivers electrical stimulation to specific areas in the brain that control movement, thus altering the abnormal signals that cause many PD motor symptoms.

DBS is typically used for individuals whose symptoms cannot be adequately controlled with medication and has proven to dramatically improve motor function and potentially reduce medication burden for many PD patients.

Research suggests that patients who carry a mutation in the glucocerebrosidase (GBA) gene may respond differently to DBS than those who do not carry the mutation. These GBA mutation carriers compose 10-17 percent of subjects undergoing DBS, and typically have higher deposits of alpha-synuclein protein in the brain. Abnormal accumulation of alpha-synuclein is thought to be a key reason for the development and progress ion of PD. These higher levels of alpha-synuclein in patients with the GBA mutation carriers may translate to even more problems with thinking, movement, behavior, and mood than

expected in typical PD. Dr. Pal and colleagues are hoping to understand how DBS affects motor function and cognition in these GBA mutation carriers over time.

"If we can determine how GBA mutation carriers respond to DBS, we can better counsel patients on expectations from the surgery, and potentially target a different region of the brain to maximize the benefit and minimize side effects from the surgery. This would be the first time that genetics would inform a clinical decision in the field of PD"

"Deep brain stimulation is a tremendous option for many Parkinson's disease patients, but not all," said Pal, who is developing a programmatic line of research involving genetics and surgical treatments for PD at the Rush Parkinson's Disease and Movement Disorders Program.

The Rush Parkinson's Disease and Movement Disorders Program is one of the largest and oldest such centers in the country, treating more than 2,000 patients annually. Rush has been a longstanding Parkinson's Disease Foundation Center of Excellence, based on decades of clinical and research excellence, and is now also recognized as a National Parkinson Foundation Center of Excellence as well.

Provided by Rush University Medical Center