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Gene Mutation Associated with an Increased Cancer Risk in Ashkenazi Jews with Parkinson's Disease

New York, NY, January 24, 2011 – A gene mutation recognized as the most frequent genetic cause of Parkinson's disease (PD) and a major cause of PD in Ashkenazi Jews (AJ) has been found to be associated with a possible risk of cancer in this population. Researchers at Beth Israel Medical Center and colleagues determined that carriers of the LRRK2 G2019S mutation had an almost threefold increase in their number of non-skin cancers compared to AJ PD patients without the mutation. The study was published November 2010 in the journal, *Movement Disorders*.

“If our findings are confirmed in a larger trial that is ongoing, it would have implications for how we treat and counsel Ashkenazi Jews with Parkinson's disease and have the potential to identify new therapies to treat or slow this disease for all patients,” said Susan B. Bressman, M.D., chairman of the Mirken Department of Neurology at Beth Israel and the senior author of the research.

“This could also have wider implications for understanding certain cancers,” noted Rachel Saunders-Pullman, M.D., associate professor of Neurology, and first author of the study. However, she emphasized, “It is premature to make decisions based on their findings”.

This study was prompted by clinical observations of patients from Beth Israel’s Parkinson’s disease Center of Excellence. Many had participated in Dr. Bressman’s earlier study of the LRRK2 G2019S gene mutation. (*New England Journal of Medicine*, 2006) that showed the mutation was a major cause of PD in Ashkenazi Jewish patients.

Among 163 unrelated AJ PD patients participating in genetic research at Beth Israel, the authors found a threefold increased risk of non-skin cancers in the LRRK2 G2019S mutation carriers when age at first cancer or age at last cancer-free exam was considered compared to non-carriers. Nine of 31 patients with the LRRK2 G2019S mutation developed cancer compared to 15 of 132 non-carrier patients. Almost two thirds of the carriers developed cancer before the onset of PD compared to 40 percent of non-carriers, despite the earlier age of PD onset among LRRK2 mutation carriers.

Both groups had common cancers including breast, lung and prostate. However, more uncommon cancers including renal cell cancer and acute myelogenous leukemia were identified in the LRRK2 group and not in the other PD group. The authors are currently evaluating a larger group of PD subjects of Ashkenazi Jewish background with two other institutions.

The study participants also included Matthew J. Barrett, MD; Kaili M. Stanley, BS; Marta San Luciano, MD; Vicki Shanker, MD; Lawrence Severt, MD, PhD.; Ann Hunt, DO; and Deborah Raymond, MS of Beth Israel Medical Center; and Laurie J. Ozelius, PhD. of Mt. Sinai School of Medicine. The work was funded by grants from the National Institute of Neurological Disorders and Stroke, the Michael J. Fox Foundation, the Thomas Hartman Foundation for Parkinson's Research, and support from Edwin and Carlyne Levy and Joseph and Carol Reich.

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