A Prospective Study of Nicotine from Edible Solanaceae and Risk of Parkinson Disease

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A Prospective Study of Nicotine from Edible Solanaceae and Risk of Parkinson Disease

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Research Abstract

? DESCRIPTION (provided by applicant): Parkinson disease (PD) is the second most common neurodegenerative disease in the United States and affects over one million Americans; this number is growing due to population aging. Most patients eventually develop severe disability, which markedly affects their quality of life and that of their caregivers. There is thus a compellig need to develop disease modifying or neuroprotective treatments. In previous epidemiologic studies, cigarette smoking has been consistently shown to be associated with a lower risk of PD

in men and women. Based on these observations, nicotine has been proposed to be a potential neuro-protective agent. However, the association between smoking and lower PD risk could be explained by a still-unknown third factor that increases the risk of PD and also causes an aversion to smoking behavior. In this context, it is of importance to examine whether nicotine from other sources, rather than cigarettes, is also associated with altered PD risk. Because a small amount of nicotine can saturate a substantial portion of nicotine receptors in the brain, we thus are able to examine the potential effects of dietary nicotine consumption on PD risk. This would provide strong evidence arguing for or against the potential casual relationship between nicotine and altered PD risk and is also important for the development of a novel prevention/treatment strategy. We thus propose to conduct a large-scale prospective study to examine whether dietary intake of nicotine and nicotine-containing solanaceae is associated with PD risk in two ongoing US cohorts including over 78,000 men and women who had never smoked. During 26-32 years of follow-up, we documented 921 incident cases of PD since dietary data were collected. We propose to examine 1) whether greater consumptions of dietary nicotine and nicotine-containing solanaceae are associated with lower risk of developing PD and 2) whether the association between dietary nicotine is more pronounced among those without environmental tobacco smoke exposure. As a secondary aim, we will examine the association between dietary intake of nicotine and toenail nicotine level, a long-term biomarker of nicotine exposure among 1,217 HPFS/NHS never-smokers with both data available. Finally, we will explore possible interactions between dietary nicotine and genetic factors (i.e., CHRNA5, iNOS2a, and SNCA) among never-smokers which have been previously shown to modify the smoking-PD relationship. Of note, with over 900 incident PD case, this is the only large prospective investigation of PD risk factors that includes repeated and detailed assessments of diet and other lifestyle factors. Given nicotine from tobacco may have adverse effects, the disease-modifying potential of dietary nicotine is of great value. This result could easily be translated in clinical practices due to the safety, acceptableness, and wide availability of edible solanaceae foods.

Further information available at:

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