Parkinson’s disease (PD) is the second most common neurodegenerative disease in the United States, affecting more than one million Americans. The disease is accompanied by stiffness, slow movements, balance difficulties, and a mild to severe tremor. It develops as the cells that produce the neurotransmitter dopamine begin to degenerate; dopamine is produced in the substantia nigra situated in the basal ganglia in the brain where it is released so that movement can take place. When the process is compromised, and 50-80% of these dopaminergic cells are lost, symptoms of Parkinson’s appear. These symptoms include those listed above (tremor, slowness, rigidity, and postural changes). Medication therapy begins as these features become more pronounced, but as the disease progresses, the duration of response to medication becomes shorter and patients develop motor complication. Side effects frequently occur and may be more distressing than the condition itself; patients often stop taking medication because of this.

There are numerous factors associated with increased risk for PD. Although genetics are thought to play important roles in some cases, environment, including exposure to pesticides, along with lifestyle risk factors, like smoking, may be responsible for most cases. Dietary factors may also be linked to development of PD. In this project the potential association between iron exposure and Parkinson’s disease will be assessed. Several studies indicate increased levels of brain iron in individuals with Parkinson’s disease. This could suggest an increased risk of PD due to dietary iron. The objective of this study will be to determine a possible relationship between dietary iron and iron content in the brain of individuals with PD and in those without PD. Because brain iron load may be affected by dietary iron, exact dietary information will be obtained in this study. The participants in the study will consist of
individuals diagnosed with PD and a control group containing healthy individuals without any neurological conditions. The first part of the study will be to perform an MRI scan to determine if there are differences in iron load and neuronal loss in the brain between individuals with PD and those without the disease. Prior to the scan, participants will fill out questionnaires regarding family history, living environment, and sleep habits. The second part of the study will be to compare iron levels in the blood between those with the disease and without the disease. Participants will be asked to provide a blood sample (less than 20 mL) for blood testing. Utilizing both the results from the MRI and blood tests, researchers will focus on determining a possible correlation between iron content and an elevated risk of PD.

Prior to the MRI scan, participants will fill out a food diary, consisting of all the food they consumed in the past three days. We will determine the nutrient content of food consumed by each individual using the computer program Nutritionist Pro, Version 1.1 201, First Databank, Inc. We will focus on nutrients possibly related to Parkinson’s disease, including minerals, antioxidants, the B vitamins, and fats. The food variables will be converted to servings/day, and the nutrient value day for each nutrient of interest will be obtained from the Nutritionist Pro database. The sum of each nutrient from each food will be calculated to determine the total nutrient/day values. Using the nutrient density methods of dietary analysis, every nutrient will then be divided by the kilocalories for each person calculated from the diet data to obtain dietary nutrient density and dietary information from supplements of multivitamins will be included. Iron from beef, beef liver, and pork will be also analyzed separately from total food iron. Adjustments for age, ethnicity, kilocalories, and smoking will also be included in the model.
REFERENCES:


