α-synuclein rs356219 Polymorphisms in Patients with Gaucher Disease and Parkinson's Disease

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Purpose of the Experiment: Mutations in □-glucocerebrosidase, the genetic defect in Gaucher disease (GD), are an important susceptibility factor for Parkinson disease (PD). A PD effector is α-synuclein (SNCA) hypothesized to selectively interact with □-glucocerebrosidase under lysosomal conditions. SNCA polymorphism rs356219 may be associated with early-age-onset PD, common among patients with GD+PD. The objective of this study was to ascertain rs356219 polymorphic genotypes of GD+PD patients in comparison to GD-only controls. As both diseases are very common and have a proven statistic link, which was not utterly investigated, this research has great significance. Procedures Used: A GD-only sex-, age-, GD genotype-, and enzyme therapy (ERT)-matched control was found for each GD+PD participant. Genomic DNA from patients and controls was amplified by PCR. The 229-bp PCR product was digested overnight at 37oC with BmgBI enzyme to create restriction. The resulting products are 119bp and 110 bp fragments which allow genotype determination of the rs356219 polymorphic area using electrophoresis. Observation/Data/Results: In GD+PD, frequency for AG+GG genotype (9) was greater than AA (5); in GD only, there was equality (7). The risk for PD was expected to increase with the number of minor alleles (G): here this was not significantly greater among GD+PD than GD only. In aggregate, there was no difference between cohorts for frequency of minor polymorphisms. Conclusions/Applications: The 14 GD+PD patients group is the largest to be investigated worldwide as for today. Thus, as a foray into potential genetic GD susceptibility for a synucleinopathy, this study may suggest new directions and hypotheses in the research of the link between GD and PD.