AAN 70th ANNUAL MEETING ABSTRACT

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Abstract Title: Tear Proteins as Possible Biomarkers for Parkinson’s Disease

Press Release Title: Shedding a Tear May Help Diagnose Parkinson’s Disease

Objective: To evaluate whether the tear fluid of people with Parkinson’s disease (PD) differs compared to people without PD.

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Background: Non-motor features of PD occur years prior to motor dysfunction, and represent a well-suited platform to investigate for a possible biomarker. Lacrimal glands are highly innervated by cholinergic neurons, and tear fluid secreted by lacrimal glands is greatly stimulated by cholinergic neurons. The production, packaging and secretion of specific proteins into tears may be regulated by changes in nerve function to lacrimal glands. Analysis of any alteration in the secretion of proteins into tears may identify a reliable and non-invasive biomarker for PD.

Design/Methods: Tear samples from 55 PD patients of varying severity and 27 age- and gender-matched non-PD controls were collected and pooled from both eyes for analysis of alpha synuclein, CC chemokine ligand 2 (CCL-2) and DJ-1 (Parkinson’s disease protein 7) using a Human magnetic Luminex assay kit (R&D systems) and analysis of oligomeric alpha synuclein using an Human alpha-synuclein oligo ELISA kit (MyBioSource), respectively.

Results: Total alpha synuclein decreased significantly in PD patients (423.12 ± 52.6 pg/mg tear protein) relative to healthy controls (703.61 ± 136.4 pg/mg tear protein) (p-value=0.05) in tears from patients acquired from Schirmer’s strips taken during an anesthetized Schirmer’s test. Oligomeric alpha synuclein increased significantly in PD patients (1.45 ± 0.31 ng/mg tear protein) relative to controls (0.27 ± 0.07 ng/mg tear protein) (p-value= 0.0007). While detectable in tears, neither CCL-2 nor DJ-1 varied between PD patients and non-PD controls

Conclusions: Total alpha synuclein and oligomeric synuclein may have potential to discriminate between tears of PD patients and healthy controls. To our knowledge this is the first report of tear collection and protein analysis as a possible non-invasive, inexpensive and reliable biomarker for PD.

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