Abstract Title: Skin Cells Express Altered Proteins that Characterize the Most Common Neurodegenerative Diseases

Press Release Title: Skin Test May Shed New Light on Alzheimer’s and Parkinson’s Diseases

Objective: To demonstrate the presence of phosphorylated Tau (p-Tau) and α-synuclein (α-Syn) in the skin from patients with the two most frequent neurodegenerative disorders, Alzheimer’s (AD) and Parkinson’s (PD) diseases

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Background: The presence of misfolded proteins is the hallmark of neurodegeneration, which is currently demonstrated through the analysis of brain tissue obtained postmortem. The brain and skin share the same embryological origin; therefore they may also express the same abnormal deposits of proteins.

Design/Methods: We took skin biopsies from the retro-auricular area in 65 subjects: 20 with AD, 16 with PD, 17 with non-neurodegenerative dementia, and 12 age-matched healthy controls. We measured the reactivity against the antibodies p-Tau (PHF: p-S296 and AT8: p-S202) and α-Syn both in sections of paraffin embedded tissue and in proteins extracted from tissue homogenates. Light and confocal microscopy were employed to localize protein aggregates by immunohistochemistry and their presence in the skin was confirmed through Western blots. Immunopositivity was assessed by means of three different methods (percentage of positive cells, a semi-quantitative scale, 0 null, + mild, ++ moderate, +++ frequent, and through image analysis using the software Image-Pro Plus Analyzer 7.0, [Media Cybernetics Inc]).

Results: The skin biopsies taken from AD and PD patients presented significantly higher levels of p-Tau immunopositivity when compared both to control subjects and patients with non-degenerative dementia (P<0.001). In PD patients, the presence of α-synuclein immunopositivity was significantly higher than in control subjects (P = 0.0004).

Conclusions: This study demonstrates the presence of p-Tau and α-synuclein in skin biopsies by immunoreactivity. This procedure could be used to open opportunity to study neurodegenerative diseases.

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