ADNI Alzheimer's Disease Neuroimaging Initiative

ADNI 1/GO/2 Longitudinal plasma P-tau181

Zetterberg H, MD, PhD; Blennow K, MD, PhD
Clinical Neurochemistry Laboratory
Inst. of Neuroscience and Physiology, University of Gothenburg, Sweden

Summary

This is an analysis of the tau protein phosphorylated at threonine 181 (P-tau181) in longitudinal plasma samples from the ADNI cohorts. P-tau is the principal component of neurofibrillary tangles, neuropil threads and dystrophic neurites in AD. P-181 is an extensively examined biomarker in cerebrospinal fluid (CSF), where increased levels are specific for AD. Recently, it has proved possible to measure P-tau181 levels also in blood samples (serum and plasma), using the MSD [1] and Simoa [2] technologies. Plasma P-tau181 levels have been shown to be increased in AD, also in early disease stages, and to correlate with brain tau pathology evaluated by PET scans [1,2].

Method

Plasma P-tau181 was analyzed by the Single Molecule array (Simoa) technique, using an in-house assay developed in the Clinical Neurochemistry Laboratory, University of Gothenburg, Sweden [2]. The assay uses a combination of two monoclonal antibodies (Tau12 and AT270) and measures N-terminal to mid-domain forms of P-tau181. Details of the assay can be found in [2]. Calibrators were run as duplicates, while plasma samples were measured in singlicate.

Dataset Information

This methods document applies to the following dataset(s) available from the ADNI repository:

Dataset Name	Date Submitted
University of Gothenburg Longitudinal plasma P-tau181	8 June 2020

References

1. Mielke MM, Hagen CE, Xu J, et al. Plasma phospho-tau181 increases with Alzheimer's disease clinical severity and is associated with tau- and amyloid-positron emission tomography. Alzheimers Dement 2018; 14: 989–97.
2. Karikari TK, Pascoal TA, Ashton NJ, Janelidze S, Benedet AL, Rodriguez JL, Chamoun M, Savard M, Kang MS, Therriault J, Schöll M, Massarweh G, Soucy JP, Höglund K, Brinkmalm G, Mattsson N, Palmqvist S, Gauthier S, Stomrud E, Zetterberg H, Hansson O, Rosa-Neto P, Blennow K. Plasma phospho-tau181 as a biomarker for Alzheimer's disease: development and validation of a prediction model using data from four prospective cohorts. Lancet Neurol 2020;19: 422–433.

About the Authors

This document was prepared by Profs. Henrik Zetterberg and Kaj Blennow, University of Gothenburg, Sweden. For more information please contact by email:
henrik.zetterberg@gu.se.
kaj.blennow@neuro.gu.se.