Longitudinal Blood Biomarker Trajectories in Preclinical Alzheimer's Disease

Yara Yakoub; Nicholas J. Ashton; Cherie Strikwerda-Brown; Laia Montoliu-Gaya; Thomas. K. Karikari; Przemysław. R. Kac; Fernando Gonzalez-Ortiz; Jonathan G. Rudolf; Pierre-François Meyer; Frédéric St-Onge; Michael Schöll; John C.S. Breitner; Henrik Zetterberg Kaj Blennow; Judes Poirier; Sylvia Villeneuve; PREVENT-AD Research Group

Background & Objective

- Alzheimer's Disease (AD) is characterized by two main pathological hallmarks that are the extracellular aggregation of amyloid-β (Aβ) plaques and neurofibrillary tau tangles in the brain.
- Imaging-based biomarkers such as Positron Emission Tomography (PET) have been used as the gold standard biomarkers to detect amyloid and tau pathology. The cost and the limited availability of PET imaging have paved the way toward the development of more cost-effective and minimally invasive tools to detect AD (e.g., blood biomarkers).
- Implementation of these novel blood biomarkers into clinical practice requires assessment of the dynamic changes of these markers across the AD spectrum. Therefore, we assessed the plasma biomarkers temporal trajectories of different AD blood biomarkers in cognitively unimpaired older adults with and without pathology on PET scans

Methods

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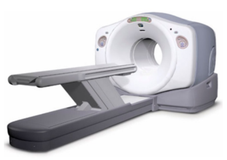
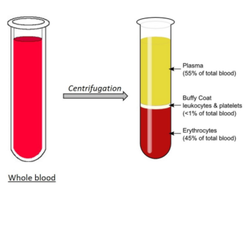
PET status (N = 127)	N
A-T-	84
A+T-	27
A+T+	15



Amyloid-PET
18[F]NAV4694-PET
Global amyloid
SUVR = 1.29

Tau-PET
18[F]AV-1451-PET
Entorhinal cortex
SUVR = 1.23



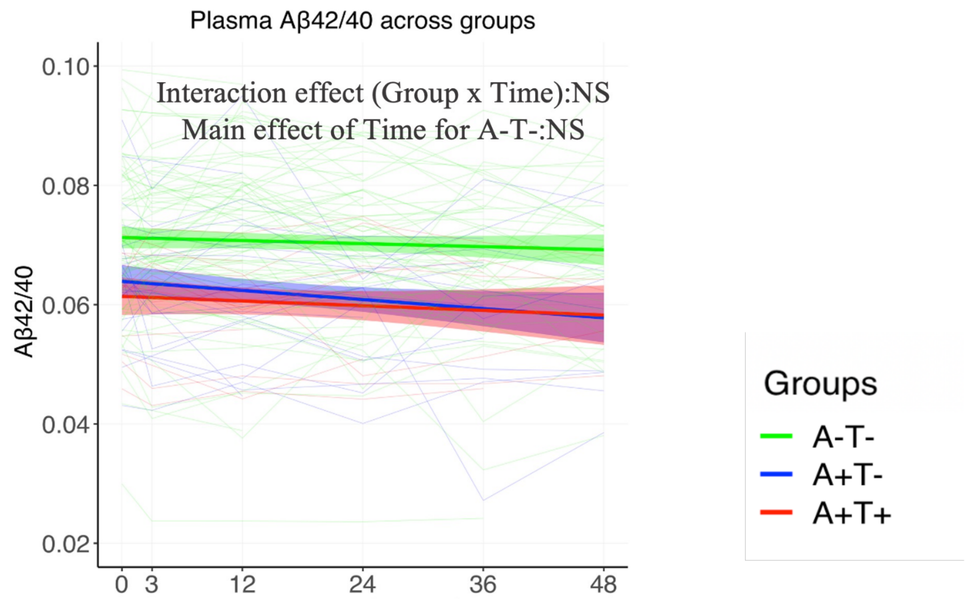
Blood draws collected between (2011-2017)
$A\beta_{42,40}$, pTau181, pTau231, NfL, and GFAP were measured using (SiMoA) assay

Statistical Analysis

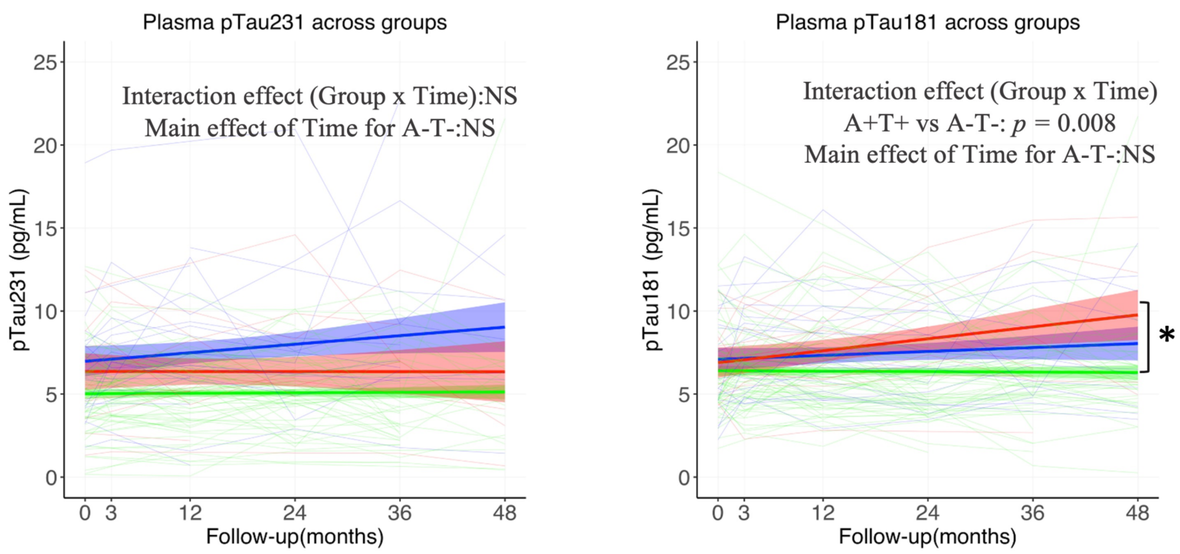
Linear Mixed effects models with group x time interaction were used to assess the longitudinal rate of change across pathological groups assessed on PET

Results

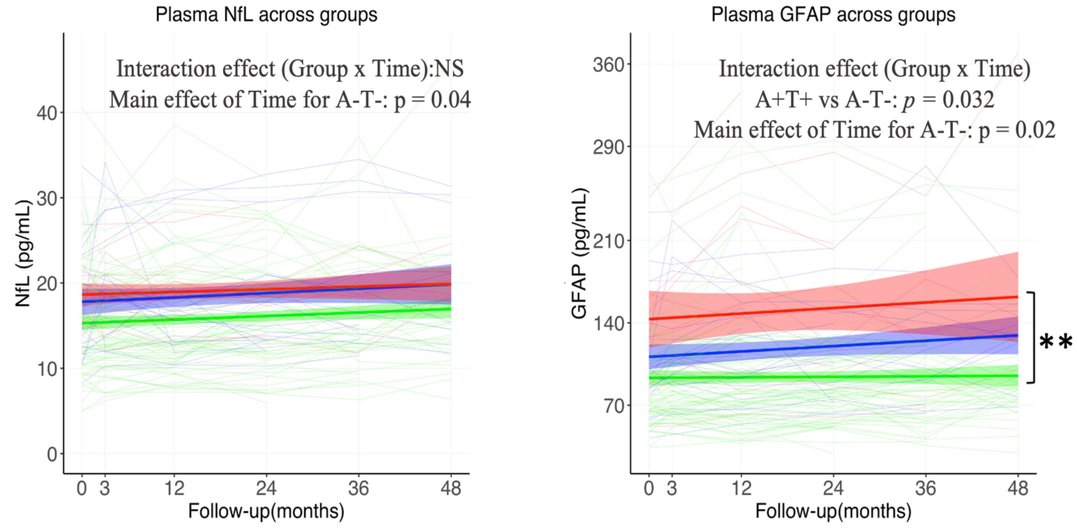
No differences in plasma $A\beta_{42/40}$ slopes among different pathological groups



Slope differences in plasma pTau181 trajectories among different pathological groups



Slope differences in plasma GFAP trajectories among different pathological groups



Summary

Potential utility of plasma markers in particular plasma pTau181 and GFAP in tracking individuals with different pathologies stages in preclinical Alzheimer's disease.

yara.yakoub@mail.mcgill.ca
@YakoubYara

Authors affiliations & online version of the poster are available here

McGill UNIVERSITY
HEALTHY BRAINS HEALTHY LIVES
Douglas INSTITUT UNIVERSITAIRE EN SANTÉ MENTALE MENTAL HEALTH UNIVERSITY INSTITUTE
PREVENT-AD Research Group

Yara Yakoub[1]; Nicholas J. Ashton[2,3,4,5]; Cherie Strikwerda-Brown[1]; Laia Montoliu-Gaya[2]; Thomas. K. Karikari [2]; Przemysław. R. Kac[2]; Fernando Gonzalez-Ortiz[2]; Jonathan G. Rudolf [1]; Pierre-François Meyer[1]; Frédéric St-Onge[1]; Michael Schöll[2,3,6]; John C.S. Breitner[1,7,8]; Henrik Zetterberg[2,6,9,10]; Kaj Blennow[2,9]; Judes Poirier[1,7]; Sylvia Villeneuve[1,7,8,11]; PREVENT-AD Research Group

[1] Douglas Mental Health University Institute, Centre for Studies on the Prevention of Alzheimer's Disease (StoP-AD), Canada; [2]Department of Psychiatry and Neurochemistry, Institute of Neuroscience and Physiology, The Sahlgrenska Academy, University of Gothenburg, Sweden; [3]Wallenberg Centre for Molecular and Translational Medicine, Department of Psychiatry and Neurochemistry, Institute of Neuroscience and Physiology, the Sahlgrenska Academy at the University of Gothenburg, Sweden; [4] King's College London, Institute of Psychiatry, Psychology & Neuroscience, Maurice Wohl Clinical Neuroscience Institute, UK; [5] NIHR Biomedical Research Centre for Mental Health & Biomedical Research Unit for Dementia at South London & Maudsley NHS Foundation, UK; [6] Department of Neurodegenerative Disease, UCL Queen Square Institute of Neurology, University College London, UK; [7]Department of Psychiatry, McGill University, Canada; [8] McGill Centre for Integrative Neuroscience, McGill University, Canada; [9] Clinical Neurochemistry Laboratory, Sahlgrenska University Hospital, Sweden;[10] UK Dementia Research Institute at UCL, UK; [11] Department of Neurology and Neurosurgery, McGill University, Canada