Title: A Head-to-Head Comparison of Clinical Performance of Two Novel Plasma pTau217 Immunoassays for Detecting Alzheimer's pathology

Hans Frykman [1-3], Anna Mammel[3], Ali Mousavi[1-3] Pankaj Kumar[1,2], Mary Encarnacion[2], Don Biehl[3], Kelsey Hallett[3], Ian Mackenzie [4], Veronica Hirsch-Reinshagen [4], Don Biehl [3], Pradip Gil[3], Shannon Pflueger[1], Ging-Yuek Robin Hsiung[1]

1. Department of Medicine, University of British Columbia, Vancouver, Vancouver, BC, Canada 2. BC Neuroimmunology lab, Vancouver, BC, Canada 3.Neurocode USA, Bellingham, WA, USA
4. Department of Pathology and Laboratory Medicine, University of British Columbia

Canadian Conference on Dementia
Hot Topics 2024 | Oct 18, 2024 | Virtual

Poster #17

Background

Plasma pTau217 is a reliable biomarker for diagnosing Alzheimer's disease. We assessed the diagnostic accuracy of two recently developed commercial immunoassays: ALZpath pTau217 and Fujirebio pTau217, for detecting Alzheimer's pathology. Pathological diagnosis was used as the gold standard, with comparisons made to the CSF amyloid Aβ42/40 ratio and CSF pTau181.

Methods

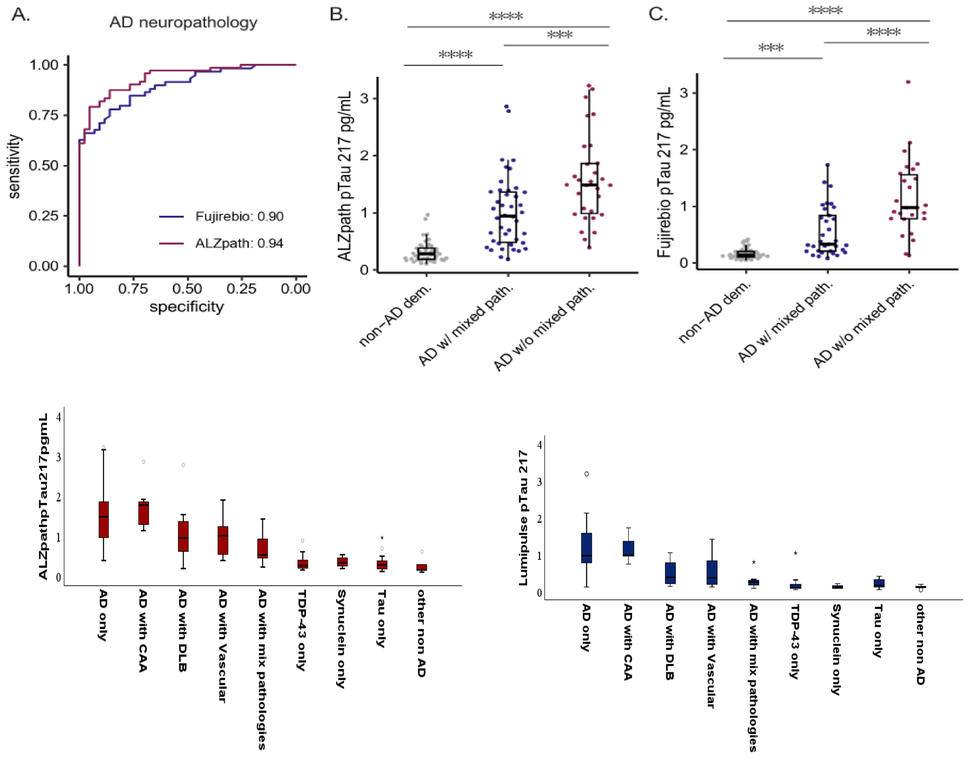
A cohort consisted of cases clinically diagnosed with AD referred to the UBC Hospital Clinic for dementia assessment (n=170)

- EDTA plasma samples
  - Plasma pTau217 was measured using
    - ALZpath Simoa pTau 217 v2 kits (Quanterix MA USA) on the Quanterix HD-X Analyzer platform
    - Lumipulse G pTau217 plasma kits on the Lumipulse G1200 platform
- CSF samples (n=55)
  - CSF Aβ42/40 ratio and pTau181 levels were measured using Lumipulse G β-Amyloid 1-40 β-Amyloid 1-42, and pTau181 kits (Fujirebio Europe N.V., Belgium) on the Lumipulse G1200 platform.

Correlations with CSF Aβ42/40 ratio and p-tau181 levels were assessed. ROC analyses were performed on both p-tau217 assays using autopsy findings as the standard

Results

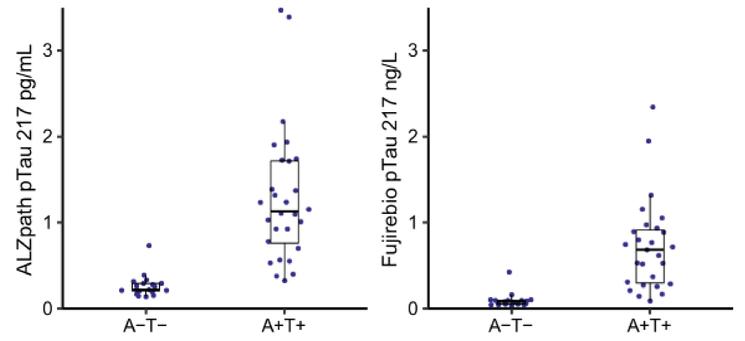
- *Amyloid positivity (A+) was determined by CSF Aβ42/40 ratio ≤ 0.058 (positive) and 0.059 – 0.072 (likely positive).*
- *Tau positivity(T+) was found out by CSF p-tau181 levels > 50.2 pg/mL.*
- Both assays showed significantly higher plasma p-tau217 concentrations in the A+T+ group compared to the A-T- group (Table and Figure 1)
- ALZpath and Fujirebio p-tau217 demonstrated excellent clinical performance
  - *For amyloid*
    - ALZpath: AUC 0.95; 95% CI 0.89 – 1.00
    - Fujirebio: AUC 0.94 0.88 – 1.00
  - *For tau status*
    - ALZpath: AUC 0.95 ; 95% CI 0.90 – 1.00
    - Fujirebio: AUC 0.94 ; 95% CI 0.88 – 1.00



Results

	A+T+ group plasma pTau217 concentrations (pg/L)	A-T- group plasma pTau217 concentrations (pg/L)
ALZPath	1.29 ± 0.79	0.26 ± 0.13
Lumipulse	0.72 ± 0.53	0.10 ± 0.09

Figure 1



Conclusion

- Our study reinforces the clinical utility of plasma pTau217 in AD diagnosis and highlights differences in the performance of current plasma pTau217 immunoassays for clinical use.
- Using a pathological diagnosis as the gold standard:
  - **ALZpath** plasma pTau217 outperformed the **Fujirebio** assay for predicting autopsy-confirmed AD pathology with an AUC of 0.94 compared to 0.90

ACKNOWLEDGEMENT

University of Gothenburg
Dr. Kaj Blennow
Hayder Shweliyya
BC Neuroimmunology
Dr. Pankaj Kumar
Dr. Andreas Jeromin
Mary Encarnacion
Dr. Ali Mousavi
neurol
Roopa Reddy
Dr. Anna Mammel
Dr. Andreas Jeromin
Don Biehl
Pradip Gill
Massachusetts General Hospital
Harvard Medical School
Beth Israel Deaconess Medical Center
Wake Forest
Dr. Michelle Mielke
AVERO DIAGNOSTICS
Dr. Ryan Fortna
Kelly Lloyd
Becky Woodford
UBC Clinic for Alzheimer Disease and Related Disorders
Dr. Robin Hsiung
Dr. Ian Mackenzie
Dr. Hirsch-Reinshagen, Veronica
Shannon Kolind
University of Pittsburgh
Dr. Thomas K Karikari
FUJIREBIO
Nathalie Le Bastard
Manu Vandijck
IFCC
Lilly
Dr. Mark Mintun and the Canada team