A more convenient and accessible way to diagnose Alzheimer's disease?

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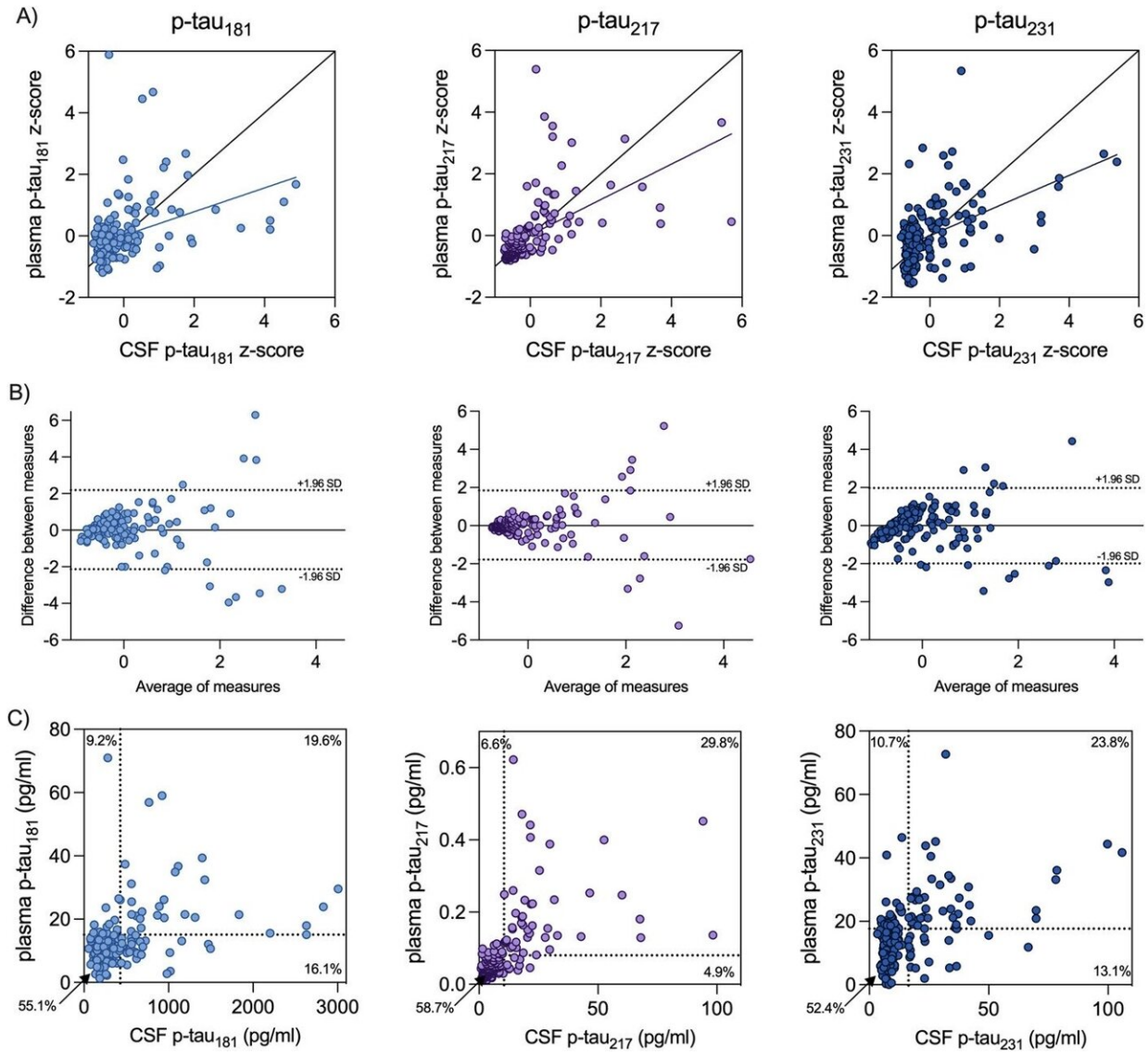

Relationship between CSF and plasma p-tau concentrations. (A) Black lines of origin along the horizontal depict a theoretical linear relationship between

variables without over- or under-estimation. The true line below the origin indicates that plasma p-tau measurements underestimate p-tau concentrations from CSF, a finding observed for p-tau$_{181}$, p-tau$_{217}$ and p-tau$_{231}$. (B) Bland-Altman analysis assessing bias between CSF and plasma measurements. Dashed lines indicate limits of agreement. Z-scores for each biomarker are represented to facilitate comparisons between measurements. (C) Within-subject agreement between classification from CSF and plasma p-tau biomarkers. Cutoff values for plasma biomarkers were determined from independent cohorts, and cutoffs for CSF biomarkers were determined using a support vector classification model (see methods). Of all three p-tau biomarkers investigated, plasma p-tau$_{217}$ had the highest rates of agreement (88.5%), followed by p-tau$_{231}$ (75.0%) and p-tau$_{181}$ (66.7%). Abnormal plasma p-tau in individuals without abnormal CSF p-tau (plasma+/CSF−) was more common than the reverse for all p-tau biomarkers, but was most pronounced for p-tau$_{181}$ and p-tau$_{217}$. Credit: *Alzheimer's & Dementia*, (2023). DOI: 10.1002/alz.13026

Despite extensive research and encouraging findings, Alzheimer's disease (AD) remains difficult to diagnose based on signs and symptoms alone. But what if one day, a blood sample during an annual check-up could be used to identify the disease?

A recent McGill-led study has found that a new kind of blood test is as effective at detecting AD as lumbar punctures, one of the current methods used to diagnose AD. Lumbar punctures, which are conducted by inserting a needle into the lower back to extract cerebrospinal fluid (CSF), are invasive and may not be accessible to all patients.

Building on previous work in which they developed the new blood test for AD in collaboration with scientists at the University of Gothenburg, the researchers studied a cohort of 174 individuals evaluated by dementia specialists. They assessed whether the same components that are commonly used to detect AD in CFS could also be used to detect AD

in blood plasma.

The results indicate that one of the components, p-tau217, was equally as effective as a biomarker for detecting AD in both blood plasma and CSF. The researchers say this may reduce the need for invasive lumbar punctures without compromising accuracy in the identification of AD.

"These results suggest that the superior scalability and availability of blood biomarkers for Alzheimer's disease are not offset by worse accuracy, paving their way to one day be used in clinical practice," says Joseph Therriault, Ph.D. candidate in the Department of Neurology and Neurosurgery under the supervision of Dr. Pedro Rosa-Neto and lead author of the study.

The research is published in *Alzheimer's & Dementia*.

More information: Joseph Therriault et al, Equivalence of plasma p-tau217 with cerebrospinal fluid in the diagnosis of Alzheimer's disease, *Alzheimer's & Dementia* (2023). DOI: 10.1002/alz.13026

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