Panel of 48 CSF proteins complements existing Alzheimer biomarkers

September 8 2023, by Elana Gotkine

A panel of 48 proteins in the cerebrospinal fluid (CSF 48 panel)

complements existing CSF biomarkers for Alzheimer disease (AD), according to a study published in the Sept. 6 issue of *Science Translational Medicine*.

Rafi Haque, M.D., Ph.D., from the Emory University School of Medicine in Atlanta, and colleagues developed a reliable and high-throughput mass spectrometry-selected reaction monitoring assay that targets 48 key proteins altered in the CSF, as identified in previous work. The diagnostic utility of the protein panel was examined in CSF collected at baseline visits from 706 participants recruited from the Alzheimer's Disease Neuroimaging Initiative (ADNI).

The researchers found that at least as good performance was seen for the CSF 48 panel as compared with existing AD CSF biomarkers (amyloid β_{42}, tTau, and $pTau_{181}$) for predicting clinical diagnosis, fluorodeoxyglucose (FDG), positron emission tomography (PET), hippocampal volume, and measures of cognitive and dementia severity.

The CSF 48 panel plus the existing AD CSF biomarkers significantly improved diagnostic performance for each of these outcomes. Compared with either measure alone, the CSF 48 panel plus existing AD CSF biomarkers significantly improved predictions for changes in FDG PET, hippocampal volume, and measures of cognitive decline and dementia severity.

"The CSF 48 panel improves upon existing AT(N) [amyloid plaques, neurofibrillary tangles, and neurodegeneration] biomarkers to predict many pathophysiological mechanisms linked to AD and AD-related dementia brain; distinguish pathophysiological mechanisms based on their proteomic signature; and improve the prediction of disease progression and future changes in cognition, dementia severity, and hippocampal volume," the authors write.

ADNI was partially supported by pharmaceutical companies.

More information: Rafi Haque et al, A protein panel in cerebrospinal fluid for diagnostic and predictive assessment of Alzheimer's disease, *Science Translational Medicine* (2023). DOI: 10.1126/scitranslmed.adg4122