APOE, diagnostic accuracy of CSF biomarkers for Alzheimer's disease

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Cerebral spinal fluid (CSF) levels of β-amyloid 42(Aβ42) are associated with the diagnosis of Alzheimer's disease (AD) and (Aβ) accumulation in the brain independent of apolipoprotein E (APOE) gene makeup.

With the emergence of biomarker dementia diagnostics, interest in CSF biomarkers associated with AD, including Aβ42 and tau proteins, is increasing. The APOE gene is the most prominent susceptibility gene for late-onset AD. For the best clinical use of genetic and CSF biomarkers, studies are needed to clarify to what extent the APOE genotype and CSF biomarkers are related and if they provide overlapping vs. complementing information for the diagnosis and prognosis of AD and whether different clinical cutoffs for CSF levels of Aβ42 should be used depending on the APOE genotype.

The author examined whether APOE genotype affects the diagnostic accuracy of CSF biomarkers for AD, in particular Aβ42 levels. They used data from four centers in Sweden, Finland and German and had three different study groups. Cohort A included 1,345 people (ages 23 to 99 years) with baseline CSF levels, including 309 individuals with AD, 287 with prodromal (mild) AD, 399 with stable mild cognitive impairment, 99 with dementias other than AD and 251 controls. Cohort B included 105 younger individuals (ages 20 to 34 years) without dementia with CSF samples. Cohort C included 118 patients (ages 60 to 80 years) with mild cognitive impairment symptoms who underwent imaging and a CSF tap.

The CSF level of Aβ42 but not total tau and another tau type were lower in APOE carriers with the ε4 alternative form of the gene compared with noncarriers regardless of the diagnostic group (cohort A). CSF levels of Aβ42 differed between patients with AD when compared with controls and those with stable mild cognitive impairment. CSF levels of Aβ42 and APOE ε4 genotype were predictors of AD diagnosis. In cohort B, APOE ε4 carrier status did not influence CSF levels of Aβ42. In cohort C, the APOE ε4 genotype did not influence CSF levels of Aβ42.

"Finally, CSF biomarkers are strongly associated with AD diagnosis and cortical Aβ deposition independently of APOE ε4 gentoype." Ronald Lautner, M.D., of Sahlgrenska University Hospital, Sweden, and colleagues wrote in their *JAMA Psychiatry* paper.

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