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The Alzheimer Disease Conversion-Related Pattern Score as Neurodegeneration Biomarker

An ADCRP score may be useful in identifying those with mild cognitive impairment who have underlying Alzheimer disease.

To create a biological definition of Alzheimer disease (AD), the amyloid-tau-neurodegeneration (ATN) classification scheme has been developed. Researchers in this study assessed the validity of an AD conversion related pattern (ADCRP) score as a biomarker for ATN in 269 participants with mild cognitive impairment (MCI). ADCRP scores were derived from two types of positron emission tomography ([^{18}F]FDG-PET of temporoparietal and precuneus/posterior cingulate activity, and [^{18}F]AV-45 amyloid PET) through a computational modeling approach. Using cerebrospinal fluid (CSF) tau levels (T) and amyloid imaging (A), normal AD biomarkers were classified as A-T- (n=67), biologically defined AD as A+T+ (n=136), AD pathologic change as A+T- (n=22), and non-AD pathologic change as A-T+ (n=44). Plasma neurofilament light chain (NfL) levels were also obtained. Participants underwent follow-up every 6 to 12 months for up to 6 years to determine clinical conversion from MCI to AD dementia.

Among those with biologically defined AD, 41% converted from MCI to AD dementia. Those with biologically defined AD had higher ADCRP scores than did those with other AT classifications. CSF tau levels were increased in biologically defined AD participants but also in those with non-AD pathological changes. Plasma NfL levels were elevated only in those with AD pathologic changes. In the biologically defined AD group, MCI converters to AD dementia had higher ADCRP scores than MCI non-converters, and ADCRP scores had higher predictive value and better risk stratification for conversion to AD dementia than CSF tau and plasma NfL levels.

COMMENT

In people with MCI, an ADCRP score may be a more specific biomarker for neurodegeneration than CSF tau and plasma NfL levels. How the ADCRP score compares to other emerging biomarkers for AD, such as plasma phospho-tau217 levels (*NEJM JW Neurol* Nov 2020 and *JAMA* 2020; 324:772), requires further study.

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At the time we reviewed this paper, its publisher noted that it was not in final form and that subsequent changes might be made.