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## Perspective on neurobiological and clinical early indicators of mild cognitive decline and alzheimer's disease

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There is a need for early diagnosis, monitoring and treatment of Alzheimer's Disease (AD) and Mild Cognitive Impairment (MCI). Traditional assessments of cognitive decline have been found to lack sensitivity and accuracy in differentiating varying stages of Dementia and cognitive decline as well as being time consuming in their administration. Key components of cognition namely memory and executive function have been identified as most predicative of AD status. Brief cognitive screening tools such as the Montreal cognitive assessment have been recommended both as a primary clinical and research assessment offering more sensitivity in differentiating AD and MCI. However, overlapping clinical features and impairments in cognitive processing suggest a need for biological risk factors. Neurobiological indicators of cognitive deterioration have been identified implicating measures of cerebrospinal fluid and temporal lobe atrophy as potential biomarkers of early clinical phases of AD and predictors of cognitive decline. Evidence shows the utility of automated classification methods in processing and analyzing multivariate neuroimaging data which improves our accuracy for the prediction of conversion of MCI to AD. In this review, we discuss the clinical usefulness of such approaches and the need for big data and multi-site studies in improving our understanding of AD neuropathology and confirming pathophysiological mechanisms that can reliably be used to differentiate MCI and AD and predict disease progression and cognitive decline.

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