Biochemical signature predicts progression to Alzheimer’s disease

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Alzheimer’s disease (AD) may be preceded by a molecular signature which is associated with hypoxia and an upregulated pentose phosphate pathway, suggests a study published online this week in Translational Psychiatry. These biomarkers can be analyzed from a serum sample months or even years before the first symptoms of AD occur, which may allow for early diagnosis of at-risk patients.

Matej Orešič and colleagues used a global metabolomics approach, which focuses on small molecules, to produce profiles of the serum metabolites associated with progression from Mild Cognitive Impairment to AD. Serum samples were collected at baseline when the patients were diagnosed with AD, Mild Cognitive Impairment, or identified as healthy controls. At follow-
up, 52 out of 143 Mild Cognitive Impairment patients had progressed to AD. Analysis of patients in relation to metabolic pathways reveals that the pentose phosphate pathway was associated with progression to AD, suggesting that hypoxia and oxidative stress are early disease processes.

Though there is no current available therapy to prevent AD, early disease detection is vital both for delaying the onset of the disease with pharmacological treatment and/or lifestyle changes and for assessing the efficacy of potential AD therapeutic agents.

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