

Positron emission tomography for Alzheimer's disease diagnosis

Positron emission tomography (PET) imaging of [18F]-2-fluoro-2-deoxy-D-glucose (FDG) is accurate in the early detection of Alzheimer's disease (AD) and in the differentiation of AD from the other causes of dementia. FDG-PET imaging is available widely and is performed easily. Different patterns of abnormality with the various causes of dementia are well described. Semiquantitative methods of image interpretation are available. Medicare covers FDG-PET imaging for the narrow indication of differentiation of possible AD from frontotemporal dementia ¹⁾.

Ferrari-Souza et al. assessed 121 individuals across the aging and Alzheimer's disease clinical spectrum with [positron emission tomography](#) (PET) brain imaging for A β ([18F]AZD4694) and tau ([18F]MK-6240), as well as CSF [GFAP](#) and [YKL-40](#) measures. They observed that higher CSF GFAP levels were associated with elevated A β -PET but not tau-PET load. By contrast, higher CSF YKL-40 levels were associated with elevated tau-PET but not A β -PET burden. Structural equation modeling revealed that CSF GFAP and YKL-40 mediate the effects of A β and tau, respectively, on hippocampal atrophy, which was further associated with cognitive impairment. The results suggest the existence of distinct astrocyte biomarker signatures in response to brain A β and tau accumulation, which may contribute to the understanding of the complex link between reactive astrogliosis heterogeneity and AD progression ²⁾.

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Coleman RE. Positron emission tomography diagnosis of Alzheimer's disease. *Neuroimaging Clin N Am.* 2005 Nov;15(4):837-46, x. doi: 10.1016/j.nic.2005.09.007. PMID: 16443494.

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Ferrari-Souza JP, Ferreira PCL, Bellaver B, Tissot C, Wang YT, Leffa DT, Brum WS, Benedet AL, Ashton NJ, De Bastiani MA, Rocha A, Therriault J, Lussier FZ, Chamoun M, Servaes S, Bezgin G, Kang MS, Stevenson J, Rahmouni N, Pallen V, Poltronetti NM, Klunk WE, Tudorascu DL, Cohen AD, Villemagne VL, Gauthier S, Blennow K, Zetterberg H, Souza DO, Karikari TK, Zimmer ER, Rosa-Neto P, Pascoal TA. Astrocyte biomarker signatures of amyloid- β and tau pathologies in Alzheimer's disease. *Mol Psychiatry.* 2022 Aug 10. doi: 10.1038/s41380-022-01716-2. Epub ahead of print. PMID: 35948658.

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