

Diagnostic value of amyloid-PET and tau-PET a head-to-head comparison

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Abstract:

Purpose: Assess the individual and combined diagnostic value of amyloid-PET and tau-PET in a memory clinic population.

Methods: Clinical reports of 136 patients were randomly assigned to two diagnostic pathways: AMY-TAU, amyloid-PET is presented before tau-PET; and TAU-AMY, tau-PET is presented before amyloid-PET. Two neurologists independently assessed all reports with a balanced randomized design, and expressed etiological diagnosis and diagnostic confidence (50–100%) three times: (i) at baseline based on the routine diagnostic workup, (ii) after the first exam (amyloid-PET for the AMY-TAU pathway, and tau-PET for the TAU-AMY pathway), and (iii) after the remaining exam. The main outcomes were changes in diagnosis (from AD to non-AD or vice versa) and in diagnostic confidence.

Results Amyloid-PET and tau-PET, when presented as the first exam, resulted in a change of etiological diagnosis in 28% ($p = 0.006$) and 28% ($p < 0.001$) of cases, and diagnostic confidence increased by 18% ($p < 0.001$) and 19% ($p < 0.001$) respectively, with no differences between exams ($p > 0.05$). We observed a stronger impact of a negative amyloid-PET versus a negative tau-PET ($p = 0.014$). When added as the second exam, amyloid-PET and tau-PET resulted in a further change in etiological diagnosis in 6% ($p = 0.077$) and 9% ($p = 0.149$) of cases, and diagnostic confidence increased by 4% ($p < 0.001$) and 5% ($p < 0.001$) respectively, with no differences between exams ($p > 0.05$).

Conclusion Amyloid-PET and tau-PET significantly impacted diagnosis and diagnostic confidence in a similar way, although a negative amyloid-PET has a stronger impact on diagnosis than a negative tau-PET. Adding either of the two as second exam further improved diagnostic confidence.

Published: 27 February 2021

European Journal of Nuclear Medicine and Molecular Imaging

<https://doi.org/10.1007/s00259-021-05246-x>

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