Prevalence of amyloid PET positivity in dementia syndromes: a meta-analysis.

Abstract:
Amyloid-β positron emission tomography (PET) imaging allows in vivo detection of fibrillar plaques, a core neuropathological feature of Alzheimer disease (AD). Its diagnostic utility is still unclear because amyloid plaques also occur in patients with non-AD dementia. To use individual participant data meta-analysis to estimate the prevalence of amyloid positivity on PET in a wide variety of dementia syndromes. The MEDLINE and Web of Science databases were searched from January 2004 to April
2015 for amyloid PET studies. Case reports and studies on neurological or psychiatric diseases other than dementia were excluded. Corresponding authors of eligible cohorts were invited to provide individual participant data. Data were provided for 1359 participants with clinically diagnosed AD and 538 participants with non-AD dementia. The reference groups were 1849 healthy control participants (based on amyloid PET) and an independent sample of 1369 AD participants (based on autopsy). Estimated prevalence of positive amyloid PET scans according to diagnosis, age, and apolipoprotein E (APOE) ?4 status, using the generalized estimating equations method. The likelihood of amyloid positivity was associated with age and APOE ?4 status. In AD dementia, the prevalence of amyloid positivity decreased from age 50 to 90 years in APOE ?4 noncarriers (86% [95% CI, 73%-94%] at 50 years to 68% [95% CI, 57%-77%] at 90 years; n = 377) and to a lesser degree in APOE ?4 carriers (97% [95% CI, 92%-99%] at 50 years to 90% [95% CI, 83%-94%] at 90 years; n = 593; P< .01). Similar associations of age and APOE ?4 with amyloid positivity were observed in participants with AD dementia at autopsy. In most non-AD dementias, amyloid positivity increased with both age (from 60 to 80 years) and APOE ?4 carrier status. Lewy bodies: carriers [n = 16], 63% [95% CI, 48%-80%] at 60 years to 83% [95% CI, 67%-92%] at 80 years; noncarriers [n = 18], 29% [95% CI, 15%-50%] at 60 years to 54% [95% CI, 30%-77%] at 80 years; frontotemporal dementia: carriers [n = 48], 19% [95% CI, 12%-28%] at 60 years to 43% [95% CI, 35%-50%] at 80 years; noncarriers [n = 160], 5% [95% CI, 3%-8%] at 60 years to 14% [95% CI, 11%-18%] at 80 years; vascular dementia: carriers [n = 30], 25% [95% CI, 9%-52%] at 60 years to 64% [95% CI, 49%-77%] at 80 years; noncarriers [n = 77], 7% [95% CI, 3%-18%] at 60 years to 29% [95% CI, 17%-43%] at 80 years. Among participants with dementia, the prevalence of amyloid positivity was associated with clinical diagnosis, age, and APOE genotype. These findings indicate the potential clinical utility of amyloid imaging for differential diagnosis in early-onset dementia and to support the clinical diagnosis of participants with AD dementia and noncarrier APOE ?4 status who are older than 70 years.