PROGNOSTIC VALUE OF 18F-FLORBETAPIR SCAN: A 36-MONTH FOLLOW UP ANALYSIS USING ADNI DATA


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BACKGROUND-AIM

The Alzheimer’s Disease Neuroimaging Initiative (ADNI) provides a unique opportunity to investigate the relationship between β-Amyloid neuropathology and patients’ long-term cognitive function change. We examined baseline 18F-florbetapir PET amyloid imaging status and 36-months change from baseline in cognitive performance in subjects with mild cognitive impairment (MCI).

METHODS

All ADNI subjects who underwent PET-imaging with 18F-florbetapir and had a clinical diagnosis of MCI at the visit closest to florbetapir imaging, were included. β-Amyloid deposition was measured by florbetapir standard uptake value ratio (SUVR), and dichotomized as Aβ+(SUVR>1.1) or Aβ–(SUVR≤1.1). The change of cognitive scores including ADAS11, MMSE and CDR sum of boxes (CDR-SB) were evaluated every 6 months. Mixed-effect Model Repeated Measures (MMRM) was applied to detect the difference between Aβ+ and Aβ– subjects’ cognitive score change from baseline, adjusting for baseline age and cognitive scores. Clinically significant cognitive change (4 point decline on the ADAS 11) was also evaluated using a multivariate-logistic-regression-model with general estimating equation (GEE) to account for within-subjects correlation. Marginal Odds Ratio was used to evaluate the risk difference for a clinically significant cognitive change among Aβ+ participants vs. Aβ– participants.

RESULTS

Of 478 MCI-subjects who had at least one florbetapir scan, 153 had a cognitive evaluation at 36-month follow up. Of those, 79 were Aβ– and 74 Aβ+. At 36-month visit, the Aβ+ vs. Aβ– group score changed from baseline (LS means 4.03 vs. 0.26 for ADAS11; -2.61 vs. -0.40 for MMSE; 1.53 vs. -0.11 for CDR-SB [p< 0.0001 all comparisons]). GEE analysis on clinically significant cognitive change showed a marginal Odds Ratio=2.18 (95% CI: 1.47–3.21) for Aβ+ vs. Aβ– groups.

CONCLUSION

MCI subjects with higher β-Amyloid deposition, had greater deterioration in cognitive function over the 36-month follow up, while subjects with no β Amyloid accumulation tended to be stable on these measurements. This finding is consistent with previously published studies.