**On-line Table: Studies in nondemented older adults evaluating the ability of automated vMRI for predicting the risk of progressing to AD**

| Study | Participants | Source of Participants | Study Quality Level | vMRI Method | Results | Limitations |
|---|---|---|---|---|---|---|
| Bakkour et al, 2009[51] | Cognitively impaired older adults ($n = 49$) | Memory disorders clinic from the US | B[a] | Baseline regional gray matter thickness | Predicted AD progression with 85% sensitivity and 65% specificity | Hippocampus and ventricles not assessed |
| Costafreda et al, 2011[52] | Patients with MCI ($n = 103$) | AddNeuroMed Consortium | B | Hippocampal shape analysis | Predicted AD progression at 1 year with 77% sensitivity and 80% specificity | Clinical applicability to population-based cohort not assessed |
| den Heijer et al, 2010[53] | Older adults ($n = 518$) | Population-based cohort from the Netherlands | B | Hippocampal volume | Baseline (mean HR = 2.2) and longitudinal (mean HR = 1.6) hippocampal volumes associated with higher dementia risk | Manual correction of brain regions was necessary in a subset of cases |
| Desikan et al, 2009[54] | Cognitively impaired older adults ($n = 129$) | Population-based cohort primarily from East Boston | B | Baseline regional gray matter volumes | Combination of entorhinal cortex (HR = 0.60) and inferior parietal lobule (HR = 0.62) best predicted time to AD progression | Manual correction of brain regions was necessary in a subset of cases |
| Heister et al, 2011[55] | Patients with MCI ($n = 192$) | ADNI | B | Fully-automated baseline hippocampal occupancy score | Predicted time to AD progression (HR = 3.9) | Clinical applicability to population-based cohort not assessed |
| Jack et al, 2010[56] | Patients with MCI ($n = 218$) | ADNI | B | Baseline hippocampal volume with high ($75^{th}$ percentile) and low ($25^{th}$ percentile) amyloid deposition | Predicted time to AD progression (HR = 2.6) | Clinical applicability to population-based cohort not assessed |
| Kovacevic et al, 2009[57] | Patients with MCI ($n = 269$) | ADNI | B | Fully-automated baseline volumes of medial temporal lobe | Smaller brain associated with longitudinal decline in MMSE and CDR-SB | Clinical applicability to population-based cohort not assessed |
| Sluimer et al, 2009[58] | Patients with MCI ($n = 44$) | Memory disorders clinic from the Netherlands | C | Longitudinal atrophy rates of 6 brain regions | Medial temporal lobe atrophy best predicted (HR = 15.8) time to AD progression | Very limited populations examined |
| Vemuri et al, 2009[59] | Patients with MCI ($n = 192$) | ADNI | B | Structural abnormality index score (STAND) | Predicted time to AD progression (HR = 2.6, 75th vs 25th percentile) | Unclear clinical applicability of vMRI method |
| Westman et al, 2011[60] | Patients with MCI ($n = 101$) | AddNeuroMed Consortium | B | Hippocampal volume and gray matter thickness | Correctly classified 74% of patients with MCI who progressed to AD at 1 year | Clinical applicability to population-based cohort not assessed |

**Note:**—Given the vast number of studies evaluating the ability of MRI measures to predict progression from MCI to AD, we focused on prospective studies using automated or semiautomated MRI methods and provide representative examples. We assessed the levels of evidence using the American Heart Association/American Stroke Association guidelines.[63]

AddNeuroMed indicates a multisite, multicenter cohort from Europe; ADNI, a multisite, multicenter cohort from North America; CDR-SB, Clinical Dementia Rating, Sum of Boxes; HR, hazard ratio; MMSE, Mini-Mental State Examination.

[a] vMRI method presented here was further validated on the ADNI cohort and population-based cohorts from North America.[61,62]