# Supplementary Material

**Cognitive, Genetic, Brain Volume, and Diffusion Tensor Imaging Markers as Early Indicators of Dementia**

**Supplementary Table 1.** Raw scores and baseline group differences for all predictor variables

| | No dementia (*n*) | Incident dementia (*n*) | No dementia M (SD) | Incident dementia M (SD) | *p* | Partial eta squared |
|---|---|---|---|---|---|---|
| **Cognitive** | | | | | | |
| Global | 173 | 16 | 0.01 (0.02) | -0.02 (0.02) | 0.001 | 0.057 |
| Perceptual Speed | | | | | | |
| Digit cancellation | 171 | 15 | 19.12 (4.23) | 15.07 (2.49) | 0.016 | 0.032 |
| Pattern comparison | 171 | 15 | 15.62 (3.47) | 11.40 (3.69) | 0.013 | 0.033 |
| Episodic memory | | | | | | |
| Word recall | 172 | 16 | 7.53 (2.29) | 5.06 (2.18) | 0.004 | 0.045 |
| Word recognition | 172 | 15 | 7.38 (4.37) | 5.00 (2.54) | 0.181 | 0.010 |
| Semantic memory | | | | | | |
| General knowledge | 172 | 16 | 7.12 (1.55) | 6.06 (1.77) | 0.076 | 0.017 |
| Vocabulary | 172 | 16 | 24.45 (3.78) | 21.50 (3.74) | 0.170 | 0.010 |
| Letter fluency | 173 | 16 | 15.19 (4.52) | 13.03 (3.26) | 0.484 | 0.003 |
| Category fluency | 173 | 16 | 20.43 (4.78) | 15.53 (3.88) | 0.049 | 0.021 |
| **Genetic** | | | | | | |
| *APOE* (any ε4 versus no ε4), *n* (%) | 170 | 16 | 49 (28.82) | 10 (62.50) | 0.002 | 0.054 |
| **Brain volume (T1)** | | | | | | |
| Total brain tissue volume, ml | 173 | 16 | 1067.25 (69.81) | 987.05 (67.64) | 0.016 | 0.031 |
| Total grey matter volume, ml | 173 | 16 | 556.95 (52.18) | 513.31 (44.67) | 0.251 | 0.007 |
| Hippocampal volume, ml | 170 | 15 | 3.80 (0.38) | 3.34 (0.36) | 0.003 | 0.047 |
| Total white matter volume, ml | 173 | 16 | 510.30 (42.65) | 473.79 (47.86) | 0.081 | 0.016 |
| **Macrostructural white matter integrity (FLAIR)** | | | | | | |
| WMH volume, ml | 167 | 16 | 0.75 (1.40) | 2.04 (1.49) | 0.076 | 0.018 |

**Microstructural white matter integrity (DTI)**

*MD*

| | | | | | | |
|---|---|---|---|---|---|---|
| Global | 173 | 16 | 81.61 (3.80) | 86.14 (4.52) | 0.006 | 0.041 |
| CCG | 173 | 16 | 81.64 (4.11) | 84.20 (3.27) | 0.713 | 0.001 |
| CHC | 173 | 16 | 97.85 (8.13) | 107.26 (10.81) | 0.012 | 0.034 |
| CS | 173 | 16 | 74.36 (2.29) | 77.37 (3.37) | 0.001 | 0.055 |
| FMAJ | 173 | 16 | 76.90 (4.23) | 82.11 (7.08) | 0.003 | 0.047 |
| FMIN | 173 | 16 | 80.58 (5.37) | 85.03 (5.45) | 0.142 | 0.012 |
| IFOF | 173 | 16 | 83.25 (3.80) | 87.46 (4.68) | 0.009 | 0.037 |
| SLF | 173 | 16 | 76.66 (3.72) | 79.55 (4.23) | 0.161 | 0.011 |
| *FA* | | | | | | |
| Global | 173 | 16 | 48.05 (2.16) | 46.23 (1.82) | 0.156 | 0.011 |
| CCG | 173 | 16 | 40.79 (2.77) | 38.15 (2.48) | 0.048 | 0.021 |
| CHC | 173 | 16 | 40.10 (2.60) | 38.96 (2.72) | 0.936 | 0.000 |
| CS | 173 | 16 | 56.43 (2.30) | 54.98 (1.78) | 0.258 | 0.007 |
| FMAJ | 173 | 16 | 58.02 (2.74) | 55.71 (2.70) | 0.075 | 0.017 |
| FMIN | 173 | 16 | 52.04 (3.21) | 49.57 (3.28) | 0.285 | 0.006 |
| IFOF | 173 | 16 | 47.04 (2.29) | 44.88 (2.05) | 0.043 | 0.022 |

WMH, white matter hyperintensities; DTI, diffusion tensor imaging; FA, fractional anisotropy; CCG, cingulum cingulate gyrus; CHC, cingulum hippocampus; CS, corticospinal tract; FMAJ, forceps major; FMIN, forceps minor; IFOF, inferior fronto-occipital fasciculus; SLF, superior longitudinal fasciculus; MD, mean diffusivity.

**Supplementary Table 2.** Correlations among global variables

| | | Any ε4 | Total brain tissue volume | Global MD |
|---|---|---|---|---|
| Global cognition | Pearson correlation | -0.021 | 0.483*** | -0.383*** |
| | (*n*) | (206) | (212) | (212) |
| Any ε4 | Pearson correlation | - | 0.045 | 0.025 |
| | (*n*) | | (206) | (206) |
| Total brain tissue volume | Pearson correlation | | - | -0.659*** |
| | (*n*) | | | (212) |

***$p < 0.001$; MD, mean diffusivity.

**Supplementary Table 3.** Correlations among specific variables

| | | SM | Cat_Flu | PS | Any ε4 | Hippoc. volume | WM volume | MD CHC | MD CS | MD FMAJ | MD IFOF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EM | Person correlation | 0.432*** | 0.577*** | 0.506*** | 0.050 | 0.338*** | 0.234** | -0.238*** | -0.246*** | -0.263*** | -0.244*** |
| | (*n*) | (211) | (211) | (208) | (205) | (205) | (211) | (211) | (211) | (211) | (211) |
| SM | Person correlation | - | 0.665*** | 0.577*** | -0.068 | 0.250*** | 0.216** | -0.262*** | -0.246*** | -0.249*** | -0.241*** |
| | (*n*) | | (212) | (208) | (206) | (206) | (212) | (212) | (212) | (212) | (212) |
| Cat_Flu | Person correlation | | - | 0.783*** | -0.006 | 0.373*** | 0.353*** | -0.401*** | -0.372*** | -0.392*** | -0.382*** |
| | (*n*) | | | (208) | (206) | (206) | (212) | (212) | (212) | (212) | (212) |
| PS | Person correlation | | | - | -0.084 | 0.444*** | 0.458*** | -0.509*** | -0.484*** | -0.503*** | -0.489*** |
| | (*n*) | | | | (202) | (202) | (208) | (208) | (208) | (208) | (208) |
| Any ε4 | Person correlation | | | | - | -0.026 | -0.058 | 0.002 | 0.067 | 0.012 | 0.017 |
| | (*n*) | | | | | (200) | (206) | (206) | (206) | (206) | (206) |
| Hippoc. vol. | Person correlation | | | | | - | 0.431*** | -0.541*** | -0.512*** | -0.528*** | -0.523*** |
| | (*n*) | | | | | | (206) | (206) | (206) | (206) | (206) |
| WM vol. | Person correlation | | | | | | - | -0.584*** | -0.421*** | -0.533*** | -0.467*** |
| | (*n*) | | | | | | | (212) | (212) | (212) | (212) |
| MD CHC | Person correlation | | | | | | | - | 0.671*** | 0.892*** | 0.802*** |
| | (*n*) | | | | | | | | (212) | (212) | (212) |
| MD CS | Person correlation | | | | | | | | - | 0.892*** | 0.891*** |
| | (*n*) | | | | | | | | | (212) | (212) |
| MD FMAJ | Person correlation | | | | | | | | | - | 0.966*** |
| | (*n*) | | | | | | | | | | (212) |

\*\**p* < 0.01, \*\*\**p* < 0.001.

EM, episodic memory; SM, semantic memory; Cat_Flu, category fluency; PS, perceptual speed; Hippoc. vol., hippocampal volume; WM vol., white matter volume; MD, mean diffusivity; CHC, cingulum hippocampus; CS, corticospinal tract; FMAJ, forceps major; IFOF, inferior fronto-occipital fasciculus.