**Supplementary Table 3. Association between Vitamin B laboratory parameters and MRI brain atrophy in normal elderly individuals (N=41) and AD patients (N=141) with follow-up. (To be continued)**

|  |  |  |  |
| --- | --- | --- | --- |
|   | **Homocysteine** | **Folate** | **Vitamin B12** |
|  | **Normal elderly**  | **AD patients** | **Normal elderly**  | **AD patients** | **Normal elderly**  | **AD patients** |
|  | **β** | **SE** | **p~** | **β** | **SE** | **p~** | **β** | **SE** | **p~** | **β** | **SE** | **p~** | **β** | **SE** | **p~** | **β** | **SE** | **p~** |
| Total Gray Matter Volume\* | 1.24E-04 | 2.48E-04 |  0.990 | -3.85E-04 | 8.98E-04 |  0.990 | -1.10E-04 | 1.46E-04 |  0.990 | 1.19E-04 | 1.09E-03 |  1.000 | 4.67E-06 | 4.09E-06 |  0.990 | -1.75E-05 | 2.42E-05 |  0.990 |
| Subcortical Gray Matter Volume\* | 3.31E-04 | 2.30E-04 |  0.990 | -6.40E-04 | 6.52E-04 |  0.990 | -1.58E-04 | 1.48E-04 |  0.990 | 6.42E-04 | 7.89E-04 |  0.990 | 7.97E-06 | 3.64E-06 | 0.990§ | -1.70E-05 | 1.76E-05 |  0.990 |
| Hippocampus Volume\* | 4.54E-04 | 3.86E-04 |  0.990 | -1.65E-03 | 9.80E-04 |  0.990 | -2.31E-04 | 2.53E-04 |  0.990 | 3.07E-03 | 1.17E-03 | 0.800§ | 1.81E-05 | 5.53E-06 | 0.160§ | 4.80E-05 | 2.64E-05 |  0.990 |
| **Cortical Volume** |   |  |   |   |  |  |   |  |   |   |  |  |   |  |  |   |  |  |
|  Total\* | 5.74E-05 | 2.92E-04 |  0.990 | -1.82E-06 | 1.21E-03 |  1.000 | -7.30E-05 | 1.72E-04 |  0.990 | -3.28E-04 | 1.47E-03 |  0.990 | 3.57E-06 | 4.82E-06 |  0.990 | -1.65E-05 | 3.27E-05 |  0.990 |
|  Frontal Lobe\* | -1.42E-04 | 2.82E-04 |  0.990 | -2.30E-04 | 1.33E-03 |  0.990 | 1.57E-06 | 1.70E-04 |  1.000 | -5.95E-05 | 1.61E-03 |  1.000 | 2.36E-06 | 4.79E-06 |  0.990 | -1.02E-05 | 3.58E-05 |  0.990 |
|  Temporal Lobe\* | 3.27E-04 | 4.53E-04 |  0.990 | 3.29E-04 | 9.67E-04 |  0.990 | -7.20E-05 | 2.63E-04 |  0.990 | -1.09E-03 | 1.17E-03 |  0.990 | 8.75E-06 | 7.32E-06 |  0.990 | -1.57E-05 | 2.61E-05 |  0.990 |
|  Parietal Lobe\* | -2.93E-06 | 3.06E-04 |  1.000 | -3.89E-04 | 1.22E-03 |  0.990 | 1.19E-05 | 2.02E-04 |  1.000 | -8.02E-04 | 1.47E-03 |  0.990 | 4.13E-06 | 4.97E-06 |  0.990 | -2.78E-05 | 3.27E-05 |  0.990 |
|  Occipital Lobe\* | 1.61E-04 | 2.85E-04 |  0.990 | 1.50E-04 | 7.49E-04 |  0.990 | -1.36E-04 | 1.82E-04 |  0.990 | -3.29E-04 | 9.05E-04 |  0.990 | -1.31E-06 | 4.56E-06 |  0.990 | -3.80E-05 | 1.99E-05 |  0.990 |
| **Cortical Thickness** |   |  |   |   |  |   |   |  |   |   |  |   |   |  |   |   |  |  |
|  Frontal Lobe\* | -1.88E-04 | 2.63E-04 |  0.990 | -3.58E-05 | 1.33E-03 |  1.000 | 2.72E-05 | 1.64E-04 |  0.992 | 3.13E-04 | 1.61E-03 |  0.990 | 2.34E-06 | 4.47E-06 |  0.990 | 7.30E-06 | 3.60E-05 |  0.990 |
|  Temporal Lobe\* | 1.54E-04 | 3.01E-04 |  0.990 | 4.83E-04 | 1.03E-03 |  0.990 | -3.61E-05 | 1.74E-04 |  0.990 | 1.33E-04 | 1.25E-03 |  1.000 | 3.94E-06 | 4.89E-06 |  0.990 | 1.64E-05 | 2.78E-05 |  0.990 |
|  Parietal Lobe\* | -1.28E-04 | 2.60E-04 |  0.990 | -6.88E-06 | 1.22E-03 |  1.000 | 6.94E-05 | 1.62E-04 |  0.990 | -3.04E-04 | 1.47E-03 |  0.990 | 9.60E-07 | 4.33E-06 |  0.990 | 1.44E-06 | 3.29E-05 |  1.000 |
|  Occipital Lobe\* | 7.29E-05 | 2.38E-04 |  0.990 | -5.06E-05 | 8.70E-04 |  1.000 | -1.42E-04 | 1.54E-04 |  0.990 | 3.52E-05 | 1.05E-03 |  1.000 | -2.55E-06 | 3.75E-06 |  0.990 | -9.63E-07 | 2.35E-05 |  1.000 |
| **Cortical Surface Area** |   |  |   |   |  |   |   |  |   |   |  |   |   |  |   |   |  |   |
|  Frontal Lobe\* | 5.62E-05 | 1.05E-04 |  0.990 | -3.23E-04 | 8.18E-04 | 0.990 | 4.43E-05 | 6.87E-05 |  0.990 | -1.11E-03 | 9.85E-04 |  0.990 | -3.84E-07 | 1.68E-06 |  0.990 | -1.80E-05 | 2.20E-05 |  0.990 |
|  Temporal Lobe\* | 2.85E-04 | 2.34E-04 |  0.990 | -5.97E-04 | 9.28E-04 |  0.990 | 2.87E-07 | 1.60E-04 |  1.000 | -1.37E-03 | 1.12E-03 |  0.990 | 5.06E-06 | 3.86E-06 |  0.990 | -3.80E-05 | 2.48E-05 |  0.990 |
|  Parietal Lobe\* | 1.71E-04 | 1.23E-04 |  0.990 | -3.08E-04 | 6.86E-04 |  0.990 | -2.18E-05 | 7.92E-05 |  0.990 | -8.74E-04 | 8.27E-04 |  0.990 | 3.66E-06 | 1.95E-06 |  0.990 | -2.94E-05 | 1.83E-05 |  0.990 |
|  Occipital Lobe\* | 1.64E-04 | 1.56E-04 |  0.990 | 3.22E-04 | 7.14E-04 |  0.990 | 3.26E-05 | 1.03E-04 |  0.990 | -6.68E-04 | 8.62E-04 |  0.990 | 1.36E-06 | 2.49E-06 |  0.990 | -3.84E-05 | 1.90E-05 | 0.990§ |

\*annualized change
Normal elderly individuals from ASPS-Fam (N=41), AD patients from PRODEM (N=141).All analyses are adjusted for age, sex, hypertension, diabetes and atrial fibrillation. Homocysteine analyses in normal elderly individuals are additionally adjusted for eGFR (calculated using CKDEpi formula), eGFR was not available in dementia patients.All Freesurfer Variables are normalised for total intracranial volume
~ p-values are false discovery rate adjusted for multiple testing.
§ p-value < 0.05 before false discovery rate correction for multiple testing.
AD: Alzheimer’s disease, MMA: methyl malonic acid, ASPS-Fam: Austrian Stroke Prevention Family Study, PRODEM: Prospective Dementia Registry; N: number of individuals in analyses, β: regression coefficient, SE: standard error of regression coefficient, p: p-value.

**Supplementary Table 3. Association between Vitamin B laboratory parameters and MRI brain atrophy in normal elderly individuals (N=41) and AD patients (N=141) with follow-up. (Continued)**

|  |  |  |
| --- | --- | --- |
|   | **Active Vitamin B12** | **MMA** |
|  | **Normal elderly** | **AD patients** | **Normal elderly** | **AD patients** |
|  | **β** | **SE** | **p~** | **β** | **SE** | **p~** | **β** | **SE** | **p~** | **β** | **SE** | **p~** |
| Total Gray Matter Volume\* | 6.61E-06 | 1.21E-05 |  0.990 | -8.40E-05 | 1.04E-04 |  0.990 | 1.08E-02 | 8.37E-03 |  0.990 | 4.68E-03 | 3.17E-02 |  0.990 |
| Subcortical Gray Matter Volume\* | 1.03E-05 | 1.17E-05 |  0.990 | -9.22E-05 | 7.57E-05 |  0.990 | 1.12E-02 | 7.65E-03 |  0.990 | 4.49E-03 | 2.31E-02 |  0.990 |
| Hippocampus Volume\* | 4.10E-05 | 1.83E-05 | 0.990§ | 1.81E-04 | 1.14E-04 |  0.990 | 2.38E-02 | 1.21E-02 | 0.990§ | -1.34E-02 | 3.49E-02 |  0.990 |
| **Cortical Volume** |   |  |  |   |  |   |   |  |   |   |  |   |
|  Total\* | 7.28E-06 | 1.42E-05 |  0.990 | -8.21E-05 | 1.41E-04 |  0.990 | 1.26E-02 | 9.78E-03 |  0.990 | 1.03E-02 | 4.28E-02 |  0.990 |
|  Frontal Lobe\* | 2.70E-06 | 1.41E-05 |  0.990 | -6.34E-05 | 1.54E-04 |  0.990 | 1.55E-02 | 9.56E-03 |  0.990 | 8.38E-03 | 4.68E-02 |  0.990 |
|  Temporal Lobe\* | 1.07E-05 | 2.18E-05 |  0.990 | -3.39E-05 | 1.13E-04 |  0.990 | 7.08E-03 | 1.53E-02 |  0.990 | 3.61E-02 | 3.40E-02 |  0.990 |
|  Parietal Lobe\* | 1.27E-05 | 1.55E-05 |  0.990 | -1.29E-04 | 1.41E-04 |  0.990 | 1.17E-02 | 1.01E-02 |  0.990 | -3.04E-02 | 4.28E-02 |  0.990 |
|  Occipital Lobe\* | 5.03E-06 | 1.41E-05 |  0.990 | -1.65E-04 | 8.59E-05 |  0.990 | -3.32E-03 | 9.21E-03 |  0.990 | 1.02E-02 | 2.64E-02 |  0.990 |
| **Cortical Thickness** |   |  |   |   |  |  |   |  |   |   |  |   |
|  Frontal Lobe\* | 1.55E-06 | 1.34E-05 |  1.000 | -4.33E-05 | 1.55E-04 |  0.990 | 1.45E-02 | 8.94E-03 |  0.990 | 1.81E-03 | 4.71E-02 |  1.000 |
|  Temporal Lobe\* | 5.35E-06 | 1.44E-05 |  0.990 | 4.79E-05 | 1.20E-04 |  0.990 | 7.52E-03 | 1.01E-02 |  0.990 | 1.13E-02 | 3.64E-02 |  0.990 |
|  Parietal Lobe\* | 1.42E-05 | 1.29E-05 |  0.990 | -6.01E-05 | 1.42E-04 |  0.990 | 1.08E-02 | 8.67E-03 |  0.990 | -1.73E-02 | 4.30E-02 |  0.990 |
|  Occipital Lobe\* | 2.95E-06 | 1.19E-05 |  0.990 | -6.79E-05 | 1.01E-04 |  0.990 | -5.98E-03 | 7.53E-03 |  0.990 | -1.46E-02 | 3.07E-02 |  0.990 |
| **Cortical Surface Area** |   |  |   |   |  |   |   |  |   |   |  |   |
|  Frontal Lobe\* | 2.56E-06 | 5.27E-06 |  0.990 | 6.56E-06 | 9.52E-05 |  1.000 | -3.55E-04 | 3.37E-03 |  1.000 | 1.59E-02 | 2.89E-02 |  0.990 |
|  Temporal Lobe\* | 7.99E-06 | 1.22E-05 |  0.990 | -1.34E-04 | 1.07E-04 |  0.990 | -5.73E-03 | 7.86E-03 |  0.990 | 1.81E-02 | 3.28E-02 |  0.990 |
|  Parietal Lobe\* | 2.41E-06 | 6.24E-06 |  0.990 | -7.57E-05 | 7.96E-05 |  0.990 | -2.99E-03 | 4.08E-03 |  0.990 | -5.37E-03 | 2.42E-02 |  0.990 |
|  Occipital Lobe\* | -9.07E-07 | 7.88E-06 |  1.000 | -9.38E-05 | 8.27E-05 |  0.990 | 5.30E-03 | 4.96E-03 |  0.990 | 2.25E-02 | 2.51E-02 |  0.990 |

\*annualized changeNormal elderly individuals from ASPS-Fam (N=41), AD patients from PRODEM (N=141).All analyses are adjusted for age, sex, hypertension, diabetes and atrial fibrillation. Homocysteine analyses in normal elderly individuals are additionally adjusted for eGFR (calculated using CKDEpi formula), eGFR was not available in dementia patients.All Freesurfer Variables are normalised for total intracranial volume
~ p-values are false discovery rate adjusted for multiple testing.
§ p-value < 0.05 before false discovery rate correction for multiple testing.
AD: Alzheimer’s disease, MMA: methyl malonic acid, ASPS-Fam: Austrian Stroke Prevention Family Study, PRODEM: Prospective Dementia Registry; N: number of individuals in analyses, β: regression coefficient, SE: standard error of regression coefficient, p: p-value.