**Supplementary Data**

**Characterizing the clinical features and atrophy patterns of *MAPT*-related frontotemporal dementia with disease progression modelling**

**Young et al**

**Table S1. List of GIF subregions included in each cortical region.**

|  |  |
| --- | --- |
| Regions included in SuStaIn | GIF Subregions |
| Orbitofrontal cortex | Anterior orbital gyrus, medial orbital gyrus, lateral orbital gyrus, posterior orbital gyrus |
| Dorsolateral prefrontal cortex | Superior frontal gyrus, middle frontal gyrus, opercular part of the inferior frontal gyrus, orbital part of the inferior frontal gyrus, triangular part of the inferior frontal gyrus |
| Ventromedial prefrontal cortex | Gyrus rectus, middle frontal cortex, subcallosal area, superior frontal gyrus medial segment |
| Motor cortex | Precentral gyrus, precentral gyrus medial segment, supplementary motor cortex |
| Opercular cortex | Frontal operculum, central operculum |
| Frontal pole | Frontal pole |
| Medial temporal cortex | Entorhinal area, fusiform gyrus, parahippocampal gyrus |
| Lateral temporal cortex | Inferior temporal gyrus, middle temporal gyrus, superior temporal gyrus |
| Temporal pole | Temporal pole |
| Supratemporal cortex | Planum polare, planum temporale, transverse temporal gyrus |
| Medial parietal cortex | Precuneus |
| Lateral parietal cortex | Parietal operculum, supramarginal gyrus, superior parietal lobule, angular gyrus |
| Sensory cortex | Postcentral gyrus, postcentral gyrus medial segment |
| Occipital cortex | Cuneus, calcarine cortex, lingual gyrus, occipital fusiform gyrus, superior occipital gyrus, inferior occipital gyrus, middle occipital gyrus, occipital pole |
| Anterior cingulate cortex | Anterior cingulate gyrus |
| Middle cingulate cortex | Middle cingulate gyrus |
| Posterior cingulate cortex | Posterior cingulate gyrus |
| Anterior insular cortex | Anterior insula |
| Posterior insular cortex | Posterior insula |

**Table S2. Comparison of neuropsychological test scores of symptomatic individuals assigned to each SuStaIn subtype.** Results reaching statistical significance at p<0.05 are highlighted in bold (\*uncorrected, \*\*corrected for multiple comparisons). NC = non-carriers (relatives of MAPT mutation carriers without a mutation in the MAPT gene, N=48), ST = symptomatic temporal (symptomatic individuals assigned to the Temporal subtype, N=20), SF = symptomatic frontotemporal (symptomatic individuals assigned to the Frontotemporal subtype, N=5).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mean Score | Median Score | p-value |
| NC | ST | SF | NC | ST | SF | NC vs. ST | NC vs. SF | ST vs. SF |
| Digit span forwards | 0.05 | -0.24 | -1.77 | -0.01 | -0.37 | -1.72 | 0.772 | **0.003\*\*** | **0.009\*** |
| Digit span backwards | 0.10 | -0.64 | -1.19 | -0.05 | -0.73 | -1.00 | 0.432 | **0.006\*** | 0.438 |
| TMT part A (time) | -0.28 | 1.09 | 2.19 | -0.40 | 0.85 | 0.96 | **<0.001\*\*** | **0.004\*\*** | 0.682 |
| TMT part A (errors) | 0.13 | -0.27 | 8.65 | -0.26 | -0.26 | -0.27 | 0.324 | 0.975 | 0.792 |
| TMT part B (time) | -0.30 | 1.52 | 2.41 | -0.43 | 1.37 | 2.20 | **<0.001\*\*** | **0.002\*\*** | 0.292 |
| TMT part B (errors) | -0.13 | 0.71 | 4.63 | -0.38 | 0.37 | 0.03 | 0.088 | 0.803 | 0.869 |
| Digit Symbol | 0.38 | -1.26 | -1.88 | 0.40 | -1.36 | -1.53 | **<0.001\*\*** | **0.002\*\*** | 0.580 |
| Boston Naming Test | -0.07 | -5.87 | -4.23 | 0.08 | -4.94 | -3.01 | **<0.001\*\*** | **0.015\*** | 0.561 |
| Category fluency | 0.18 | -2.1 | -1.86 | 0.10 | -2.15 | -1.65 | **<0.001\*\*** | **0.004\*\*** | 0.816 |
| Phonemic fluency | -0.02 | -1.54 | -1.5 | -0.03 | -1.44 | -1.25 | **<0.001\*\*** | 0.073 | 0.969 |
| Block design | 0.31 | -0.79 | -1.67 | 0.52 | -0.86 | -1.93 | **<0.001\*\*** | **0.003\*\*** | 0.097 |

**Table S3. Comparison of clinical scales scores of symptomatic individuals assigned to each SuStaIn subtype.** Results reaching statistical significance at p<0.05 are highlighted in bold (\*uncorrected, \*\*corrected for multiple comparisons). NC = non-carriers (relatives of MAPT mutation carriers without a mutation in the MAPT gene, n=48), ST = symptomatic temporal (symptomatic individuals assigned to the Temporal subtype, n=20), SF = symptomatic frontotemporal (symptomatic individuals assigned to the Frontotemporal subtype, n=5).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Mean score | Median score | p-value |
|  | NC | ST | SF  | NC | ST | SF | NC vs ST | NC vs SF | ST vs. SF |
| Behavioural | Disinhibition | 0 | 1.25 | 0.80 | 0 | 1 | 0 | **<0.001\*\*** | **<0.001\*\*** | 0.325 |
| Apathy | 0.01 | 1.30 | 0.40 | 0 | 1.5 | 0.5 | **<0.001\*\*** | **<0.001\*\*** | 0.092 |
| Loss of empathy | 0.01 | 1.32 | 0.60 | 0 | 0.75 | 0.5 | **<0.001\*\*** | **<0.001\*\*** | 0.359 |
| Ritualistic or compulsive behaviour | 0.01 | 1.30 | 0.40 | 0 | 1 | 0 | **<0.001\*\*** | **0.001\*** | 0.072 |
| Hyperorality or appetite change | 0 | 1.18 | 0 | 0 | 1 | 0 | **<0.001\*\*** | 0.811 | **0.020\*** |
| Neuropsychiatric | Visual hallucinations | 0 | 0.08 | 0 | 0 | 0 | 0 | **0.018\*\*** | NA | 0.516 |
| Delusions | 0 | 0.20 | 0.40 | 0 | 0 | 0 | **0.004\*\*** | **0.001\*** | 0.749 |
| Depression | 0.07 | 0.42 | 0 | 0 | 0 | 0 | **0.005\*** | 0.419 | 0.109 |
| Anxiety | 0.11 | 0.60 | 0.40 | 0 | 0.25 | 0 | **<0.001\*\*** | 0.545 | 0.407 |
| Language | Impaired articulation | 0 | 0.25 | 0 | 0 | 0 | 0 | **<0.001\*\*** | NA | 0.242 |
| Decreased fluency | 0.01 | 0.50 | 0.50 | 0 | 0 | 0 | **<0.001\*\*** | **0.002\*** | 0.937 |
| Impaired grammar/syntax | 0.01 | 0.25 | 0.60 | 0 | 0 | 0 | **<0.001\*** | **0.030\*** | 1.000 |
| Impaired word retrieval | 0.04 | 0.68 | 0.60 | 0 | 0.5 | 0 | **<0.001\*\*** | **0.005\*** | 0.799 |
| Impaired speech repetition | 0 | 0.02 | 0.10 | 0 | 0 | 0 | 0.457 | **0.033\*** | 0.312 |
| Impaired sentence comprehension | 0 | 0.32 | 0.40 | 0 | 0 | 0 | **<0.001\*\*** | **0.030\*** | 0.964 |
| Impaired single word comprehension | 0 | 0.40 | 0.10 | 0 | 0 | 0 | **<0.001\*\*** | **0.001\*** | 0.320 |
| Dyslexia | 0.04 | 0.22 | 0 | 0 | 0 | 0 | 0.165 | 0.623 | 0.400 |
| Dysgraphia | 0.02 | 0.25 | 0.40 | 0 | 0 | 0 | **0.006\*** | **0.033\*** | 0.922 |
| Impaired functional communication | 0 | 0.50 | 0.40 | 0 | 0 | 0 | **<0.001\*\*** | **0.001\*** | 0.512 |
| Cognitive | Memory impairment | 0.08 | 1.75 | 0.30 | 0 | 2 | 0 | **<0.001\*\*** | 0.110 | **0.003\*** |
| Visuospatial/perceptual impairment | 0 | 0.38 | 0 | 0 | 0 | 0 | **<0.001\*\*** | NA | 0.243 |
| Impaired judgment/problem solving | 0 | 1.60 | 0.70 | 0 | 2 | 0.5 | **<0.001\*\*** | **<0.001\*\*** | 0.085 |
| Impaired attention/concentration | 0.08 | 1.40 | 0.60 | 0 | 1 | 1 | **<0.001\*\*** | **<0.001\*\*** | 0.124 |
| Motor | Dysarthria | 0 | 0.15 | 0 | 0 | 0 | 0 | 0.100 | NA | 0.689 |
| Dysphagia | 0 | 0.05 | 0 | 0 | 0 | 0 | **0.018\*** | NA | 0.516 |
| Tremor | 0.01 | 0.12 | 0 | 0 | 0 | 0 | 0.108 | 0.811 | 0.516 |
| Slowness | 0 | 0.55 | 0.20 | 0 | 0.25 | 0 | **<0.001\*\*** | **0.001\*** | 0.272 |
| Weakness | 0 | 0.15 | 0.40 | 0 | 0 | 0 | **0.004\*** | **0.001\*** | 0.709 |
| Gait disorder | 0 | 0.30 | 0 | 0 | 0 | 0 | **<0.001\*\*** | NA | 0.188 |
| Falls | 0 | 0.18 | 0.20 | 0 | 0 | 0 | **0.004\*** | **0.001\*** | 0.831 |
| Cambridge Behavioural Inventory – Revised | Memory and Orientation | 1.44 | 16.53 | 4.40 | 0 | 16 | 0 | **<0.001\*\*** | 0.648 | **0.007\*** |
| Everyday skills | 0.14 | 6.05 | 1.20 | 0 | 3 | 0 | **<0.001\*\*** | 0.117 | **0.036\*** |
| Self-care | 0 | 1.84 | 1.60 | 0 | 0 | 0 | **<0.001\*\*** | **0.002\*** | 0.672 |
| Abnormal behaviour | 0.75 | 7.11 | 4.80 | 0 | 6 | 1 | **<0.001\*\*** | **0.006\*** | 0.239 |
| Mood | 1.07 | 3.84 | 3.20 | 0 | 4 | 2 | **<0.001\*\*** | **0.011\*** | 0.518 |
| Beliefs | 0.01 | 0.47 | 0.60 | 0 | 0 | 0 | **0.001\*** | **0.038\*** | 0.925 |
| Eating habits | 0.64 | 6.21 | 1.20 | 0 | 4 | 0 | **<0.001\*\*** | 0.937 | **0.018\*** |
| Sleep | 0.34 | 2.08 | 3.33 | 0 | 1 | 4 | **<0.001\*\*** | **0.025\*** | 0.540 |
| Stereotypic and motor behaviours | 0.76 | 7.95 | 3.40 | 0 | 7 | 0 | **<0.001\*\*** | 0.607 | 0.074 |
| Motivation | 0.66 | 8.89 | 2.80 | 0 | 9 | 0 | **<0.001\*\*** | 0.749 | 0.061 |
| Total CBI-R score | 5.96 | 61.74 | 25.60 | 1 | 61 | 10 | **<0.001\*\*** | **0.010\*** | **0.039\*** |