1. **Supplementary Material**

**Table S1 - Summary of demographics and clinical data.** Significant group differences are shown in bold (p<0.05). Numbers represent mean ± standard deviation (or percentage). \*Data available for 16 patients; \*\* Data available for 15 patients; BP = Blood Pressure; sSVD=Sporadic Small Vessel Disease.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **SVD (N=17)** | **Healthy controls** **(N = 12)** | **Group comparison** |
| CADASIL(N=6) | sSVD(N = 11) |
| **Age (years)** | 50 ± 9 | 52 ± 6 | p = 0.70 |
| 47 ± 11 | 52 ± 7 | p = 0.44† |
| **Sex (% Female)** | 13 (77) | 6 (50) | p = 0.14 |
| 4 (67) | 9 (82) | p = 0.28† |
| **Education (years)** | 10 ± 6 | 17 ± 4 | **p < 0.001** |
| 10 ± 6 | 11 ± 5 | p = 0.72† |
| **Hypertension (%)\*** | 10 (62) | - | - |
| 1 (20) | 9 (82) | **p = 0.02**† |
| **Systolic BP (mmHg)\*\*** | 134 ± 20 | - | - |
| 135 ± 22 | 133 ± 21 | p = 0.92† |
| **Diastolic BP (mmHg)\*\*** | 79 ± 14 | - | - |
| 79 ± 12 | 78 ± 16 | p = 0.97† |
| **Diabetes Mellitus (%)\*** | 1 (6) | - | - |
| 0 | 1 (9) | p = 0.49† |
| **Hypercholesterolaemia (%)\*** | 9 (56) | - | - |
| 2 (12) | 7 (41) | p = 0.38† |
| **Previous Stroke (%)\*** | 4 (25) | - | - |
| 2 (12) | 2 (12) | p = 0.35† |
| **Smoker (%)\*** | 5 (31) | - | - |
| 1 (6) | 4 (24) | p = 0.51† |
| **History of depression (%)\*** | 8 (50) | - | - |
| 2 (12) | 6 (35) | p = 0.59† |
| †Comparison between CADASIL and sSVD groups. |

**Table S2 – Composite scores used for evaluation of executive function and processing speed: individual tests used to obtain the composite scores.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Cognitive Index** | **Neuropsychological Test** | **Measures** | **Composite Score** |
| Executive Function | Stroop (Fernandes, 2013) | Total Interference Score  | Stroop+TMTB-A=Average of *z*-scores |
| Trail Making Test (Cavaco et al., 2013) | Part B-A - Time to complete |
| Processing Speed | Trail Making Test (Cavaco et al., 2013) | Part B - Time to complete | TMTA+TMTB=Average of *z*-scores |
| Part A - Time to complete |

**Figure S1** – **Illustrative examples of FA histograms from all subjects obtained using the different masks: TBSS (left) and NAWM (right);** and demonstrating the histogram-based metrics (median and peak width).



**Figure S2** – **Illustrative examples of MD histograms from all subjects obtained using the different masks: TBSS (left) and NAWM (right);** and demonstrating the histogram-based metrics (median and peak width).



**Figure S3** – **Illustrative examples of scatter plots showing the relationship between one DTI metric and both cognitive domains.** In this example, the relation between *MD peak width* for both masks: *TBSS and NAWM*; executive function (upper panel) and processing speed (lower panel) are displayed. The correlation coefficients (r), uncorrected p-values and 95% confidence interval (gray area) are reported.



**Figure S4** – **Illustrative examples of scatter plots showing the relationship between one DTI metric and both cognitive domains.** In this example, the relation between *MD peak height* for both masks: *TBSS and NAWM*; executive function (upper panel) and processing speed (lower panel) are displayed. The correlation coefficients (r), uncorrected p-values and 95% confidence interval (gray area) are reported.

