**Altered Intrinsic Default Mode Network Functional Connectivity in Patients with Remitted Geriatric Depression and Amnestic Mild Cognitive Impairment**

***Supplementary Information***

Supplementary information: 4 Tables and 1 Figure

**Table S1. The Effect Size of Statistical Difference of Demographic and Clinical Information between Groups**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **F/χ2/t/H** | ***p*** | **ES**  ***η*2/*φ*/*d*** |
| Sex  (male/female) | 2.400 | 0.494 | - |
| Age | 0.135 | 0.939 | - |
| Education | 1.185 | 0.318 | - |
| HAMD | 14.329 | <0.001 | 0.244\*\* |
| Age at Onset | -0.688 | 0.494 | - |
| Duration of Depression | -0.184 | 0.855 | - |
| MMSE | 7.113 | <0.001 | 0.139\* |
| MDRS | 32.718 | <0.001 | 0.223\*\* |

Abbreviation: ES: effect size. HAMD: Hamilton Depression Rating Scale for Depression; MMSE: Mini-Mental Status Examination; MDRS: Mattis Dementia Rating Scale.

\*: intermediate effect; \*\*: Large effect.

**Table S2. The Effect Size of Statistical Difference of raw neuropsychological scores in ANOVA.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **F/H** | ***p*** | **ES**  ***η*2** |
| **Attention** |  |  |  |
| DS-forward | 2.720 | 0.047 | - |
| DS-backward | 1.944 | 0.126 | - |
| **Executive Function** |  |  |  |
| SCWT-C（seconds） | 7.798 | <0.001 | 0.150\*\* |
| Semantic similarity | 12.713 | <0.001 | 0.223\*\* |
| TMT-b（seconds） | 15.417 | 0.001 | 0.093\* |
| **Language** |  |  |  |
| Fluency-animal | 13.281 | <0.001 | 0.231\*\* |
| Naming Test | 3.867 | 0.011 | 0.080\* |
| **Memory** |  |  |  |
| AVLT- immediately | 37.228 | <0.001 | 0.456\*\* |
| AVLT-DR | 122.064 | <0.001 | 0.734\*\* |
| AVLT- recognition | 44.382 | 0.000 | 0.311\*\* |
| LMT-DR | 22.878 | <0.001 | 0.340\*\* |
| Rey-CFT-DR | 20.205 | <0.001 | 0.313\*\* |
| **Processing Speed** |  |  |  |
| DSST | 6.663 | <0.001 | 0.131\* |
| TMT-a（seconds） | 1.789 | 0.152 | - |
| **Visuospatial** |  |  |  |
| CDT | 5.310 | 0.002 | 0.107\* |
| Rey-CFT-copy | 3.286 | 0.023 | 0.069\* |

Abbreviation: DS: Digit Span Test; SCWT: Stroop Color Word Test; TMT: Trail Making Test; AVLT: Auditory Verbal Learning Test; LMT: Logical Memory Test; Rey-CFT: Rey–Osterrieth Complex Figure Test; DSST: Digit Symbol Substitution Test; CDT: Clock Drawing Task; ANOVA: one-way analysis of variance; ES: effect size.

\*: intermediate effect; \*\*: Large effect.

**Table S3. ANCOVA Analyses of Functional Connectivity with PCC as Seed**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Seed region** | **Target regions** | **F** | ***P*** | **ES: *η*2** |
| PCC | M-SFG | 4.007 | 0.006 | 0.085\* |
| MCG | 5.559 | 0.004 | 0.113\*\* |
| L-MFG | 6.314 | 0.002 | 0.127\*\* |
| R-Angular | 6.000 | 0.004 | 0.121\*\* |
| L-Angular | 7.176 | <0.001 | 0.141\*\* |

After AlphaSim correction, there were still significantly decreased connectivity among RGD-aMCI, RGD, aMCI and HCs. Including bilateral M-SFG, bilateral MCG, L-MFG, L-angular and R-angular.

Abbreviations: PCC: psterior cingulate cortex; M-SFG: medial superior frontal gyrus; MCG: middle cingulate gyrus; L-MFG: left medial frontal gyrus; R/L Angular: Right/Left Angular. RGD: remitted geriatric depression; aMCI: amnestic mild cognitive impairment; RGD-aMCI: RGD comorbid with aMCI; HC: health comparison; HC: healthy Comparison; rsFC: resting state functional connectivity; ANCOVA: one-way analysis of covariance; ES: effect size.

\*: intermediate effect; \*\*: Large effect.

**Table S4. Decreased M-SFG rsFC in three patients groups compared to HC after AlphaSim Correction**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Seed**  **region** | **Target**  **region** | **groups** | **Mean (SD)** | **95% Confidence**  **Interval** | | ***P*** |
| PCC | bilateral  M-SFG | RGD-aMCI | -0.0038(0.1389) | -0.0624 | 0.0549 | 0.002 |  |
| RGD | 0.0013(0.1320) | -0.0520 | 0.0545 | 0.006 |
| aMCI | -0.0049(0.1810) | -0.0635 | 0.0538 | <0.001 |

After AlphaSim correction, the other three patient groups still had similar significant reduction of DMN rsFC in bilateral M-SFG, compared with the HC group.

Abbreviations: PCC: psterior cingulate cortex; M-SFG: medial superior frontal gyrus; RGD: remitted geriatric depression; aMCI: amnestic mild cognitive impairment; RGD-aMCI: RGD comorbid with aMCI; HC: health comparison; rsFC: resting state functional connectivity.

**Figure. S1 Correlation Between rsFC of M-SFG and Cognitive Deficit Without the Outliers in RGD-aMCI and RGD Group**



The PCC-seed rsFC of M-SFG was positively correlated with scores of AVLT-DR in the RGD-aMCI subjects, and positively correlated with scores of CDT in the RGD subjects without the outliers (two-tailed *p*<.05).

Abbreviations: RGD: remitted geriatric depression; RGD- aMCI: RGD comorbid with aMCI; HC: health comparisons; PCC: Posterior cingulate cortex; rsFC: resting-state functional connectivity; M-SFG: medial superior frontal gyrus; AVLT-DR: auditory verbal learning test-delay; CDT: clock drawing task.