**Supplementary Material**

*AD diagnosis and inclusion/exclusion criteria*

 All participants underwent a complete physical, neuropsychological, and functional evaluation. Determination of thyroid hormones, vitamin B12, and folic acid levels and examination of diagnostic imaging scans allowed excluding changes that could induce severe cognitive deficits other than AD.

 Possible/probable AD was diagnosed according to DSM-IV [1] or NINCDS-ADRDA criteria [2]. The inclusion criteria were age 65 years or older, availability during the training and testing phases, a CDR score of 1 (mild dementia) or 2 (moderate dementia), and the involvement of a caregiver. The exclusion criteria were serious medical and psychiatric conditions and sensorimotor deficits that would prevent participation in CI training, participation in a previous cognitive training program, severe AD, and neurodegenerative disorders other than AD.

*Comprehensive intervention*

 In the 10 once weekly sessions, individualized approach helped patients identify the goals set for them and to exercise strategies that would allow to reach these objectives. Patients were taught some mnemonic techniques aimed to enhance attention (especially orientation, activities of daily living planning, and episodic and prospective memory) and were asked to do daily cognitive homework with the help and support of a caregiver (e.g., to learn categorization, clustering, and attention strategies and visuospatial processes). The CI also included advice on healthy lifestyle, like diet, alcohol consumption, smoking habits, physical and leisure activities. Patient-tailored psychological support was also provided to patients and caregivers to reduce functional disabilities.

*Measurement of pBDNF concentration*

 Blood was centrifuged at 200 x g for 10 min. Platelet-rich plasma was then centrifuged at 1,500 x g for 15 min to separate plasma from platelets. Plasma was immediately stored at –80°C until use. pBDNF (pro-BDNF and mature BDNF) was determined using a commercial kit (BDNF Human ELISA kit, ab99978, Abcam, Cambridge, UK) in line with the manufacturer’s instructions. Results were expressed as mg/ml. All samples were tested in duplicate.

*Statistical analyses*

 Since pBDNF concentrations were not normally distributed, values were log-transformed; means and 95 % confidence interval were then back-transformed for presentation. Unless otherwise specified, results are expressed as mean ± standard error of the mean (SEM) in the case of continuous variables and as percentage for categorical variables. Between-group comparisons were performed using Student’s t test/χ-square test; among-group comparisons (3 groups) at baseline were performed using one-way ANOVA followed by Bonferroni’s post-hoc test; before/after CI data (baseline versus FU1) and baseline, FU1, FU2, and FU3 data were tested with the General Linear Model; Pearson’s coefficient was used to assess correlations between variables. A p value < 0.05 was set for significance.

**REFERENCES**

[1] American Psychiatric Association (2000) *Diagnostic and statistical manual of mental disorders (4th ed.)*, American Psychiatric Association, Washington DC.

[2] McKhann GM, Knopman DS, Chertkow H, Hyman BT, Jack CR Jr, Kawas CH, Klunk WE, Koroshetz WJ, Manly JJ, Mayeux R, Mohs RC, Morris JC, Rossor MN, Scheltens P, Carrillo MC, Thies B, Weintraub S, Phelps CH (2011) The diagnosis of dementia due to Alzheimer's disease: recommendations from the National Institute on Aging-Alzheimer's Association workgroups on diagnostic guidelines for Alzheimer's disease. *Alzheimers Dement* **7**, 263-269.

[3] Magni E, Binetti G, Bianchetti A, Rozzini R, Trabucchi M (1996) Mini-Mental State Examination: a normative study in Italian elderly population. *Eur J Neurol* **3**, 198-202.

**Supplementary Table 1.** Baseline socio-demographic data and neuropsychological profile of participants.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Healthy(n=85) | AD(n=80) | p value |
| Age (years) | 72.71 ± 0.61 | 77.45 ± 0.60 | **< 0.001** |
| Gender (females/total) | 67/85 | 58/80 | 0.344 |
| Marital status (%): married unmarried widowed | 50.68.241.2 | 62.50.037.5 | **< 0.05** |
| Years of schooling | 9.29 ± 0.50 | 4.78 ± 0.33 | **< 0.001** |
| MMSE\* | 28.13 ± 0.11 | 19.69 ± 0.38 | **< 0.001** |
| GDS | 7.99 ± 0.56 | 8.09 ± 0.62 | 0.905 |
| ADL | 5.98 ± 0.01 | 5.23 ± 0.12 | **< 0.001** |
| IADL | 7.98 ± 0.02 | 3.35 ± 0.22 | **< 0.001** |

AD, patients with Alzheimer’s disease; MMSE, Mini Mental State Examination; GDS, Geriatric Depression Scale; ADL, Activities of Daily Living; IADL, Instrumental Activities of Daily Living. Significant differences are in bold. \* MMSE scores were corrected for age and schooling [3]