**Supplementary material:**

Table 1: Neuropsychological test scores for PD patients and healthy controls.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | HC  (n=19) | PD-nSCD  (n=8) | PD-SCD  (n=12) | PD-MCI  (n=22) |  |  | HC vs  PD-SCD | HC vs  PD-MCI | | | PD-nSCD vs  PD-MCI | | PD-SCD vs  PD-MCI | |
| *Variable* | M(SD) | M(SD) | M(SD) | M(SD) | *H* test | *p*-value | *p*-value | r | *p*-value | r | *p*-value | r | *p*-value | r |
| *Attention–working memory* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Digit Span backward | 4.32(1.34) | 4.88(1.13) | 3.92(1.00) | 3.32(0.89) | 12.609 | .006 c |  |  |  |  | .007 | .59 |  |  |
| Stroop test-Word | 94.89(14.66) | 109.00(22.17) | 82.17(11.83) | 66.91(21.70) | 25.366 | .000 b, c |  |  | .000 | .63 | .000 | .76 |  |  |
| Stroop test-Color | 60.89(12.27) | 70.38(19.85) | 52.83(9.09) | 48.05(11.63) | 14.184 | .003 b, c |  |  | .015 | .47 | .014 | .56 |  |  |
| Stroop test-Word-color | 32.32(11.87) | 40.75(10.55) | 28.92(10.34) | 25.00(8.75) | 11.550 | .009 c |  |  |  |  | .008 | .59 |  |  |
| Stroop test-Interference | -4.53(8.41) | -2.10(5.17) | -3.14(7.40) | -2.49(7.11) | 0.886 | .829 |  |  |  |  |  |  |  |  |
| *Executive functions* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| WCST (categories) | 3.88(1.97) | 4.50(2.14) | 2.75(1.49) | 1.00(1.02) | 26.400 | .000 b, c, d |  |  | .000 | .70 | .000 | .72 | .035 | .47 |
| Letter fluency | 25.47(9.55) | 31.75(7.67) | 27.00(9.46) | 16.86(6.17) | 20.605 | .000 b, c, d |  |  | .012 | .48 | .001 | .72 | .017 | .51 |
| Animals | 17.00(5.24) | 17.75(5.18) | 16.67(3.37) | 14.59(2.72) | 5.716 | .126 |  |  |  |  |  |  |  |  |
| *Learning and memory* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CVLT-Total learning | 53.68(12.67) | 51.00(4.63) | 49.25(9.86) | 42.50(11.94) | 8.971 | .030 b |  |  | .033 | .43 |  |  |  |  |
| CVLT-Delay | 11.84(4.02) | 11.25(2.49) | 10.33(2.67) | 9.23(3.64) | 5.458 | .141 |  |  |  |  |  |  |  |  |
| CVLT-Delay (semantic cued) | 13.00(3.00) | 11.38(2.00) | 10.92(2.91) | 9.86(3.20) | 9.745 | .021 b |  |  | .013 | .48 |  |  |  |  |
| 8/30 SRT-Total learning | 30.32(7.62) | 30.75(5.75) | 25.67(7.14) | 21.29(6.40) | 16.508 | .001 b, c |  |  | .001 | .58 | .021 | .54 |  |  |
| 8/30-Delay | 5.74(1.97) | 6.00(2.33) | 5.17(1.90) | 4.10(1.87) | 8.323 | .040 e |  |  |  |  |  |  |  |  |
| *Visuospatial functions* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| FRT | 22.37(2.09) | 21.50(1.85) | 19.92(2.15) | 19.95(2.26) | 13.780 | .003 a, b | .016 | .54 | .009 | .49 |  |  |  |  |
| JLOT | 13.26(1.37) | 13.38(1.51) | 13.25(1.36) | 8.82(3.49) | 24.194 | .000 b, c, d |  |  | .000 | .65 | .006 | .60 | .002 | .61 |
| Block design | 15.58(3.98) | 17.00(6.32) | 15.33(5.61) | 7.24(4.12) | 27.128 | .000 b, c, d |  |  | .000 | .70 | .001 | .69 | .002 | .63 |
| *Language* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Naming test | 18.74(1.45) | 19.00(0.54) | 18.17(1.75) | 16.18(2.91) | 14.698 | .002 b, c |  |  | .004 | .53 | .035 | .50 |  |  |

*Note.* n = number of the sample in each group; HC = healthy controls; PD = Parkinson’s disease; PD-nSCD = PD patients without subjective cognitive decline; PD-SCD = PD patients with subjective cognitive decline; PD-MCI = PD patients with mild cognitive impairment; M = mean; SD = standard deviation; WCST = Wisconsin Card Sorting Test; CVLT = California Verbal Learning Test; 8/30 SRT = 8/30 Spatial Recall Test; FRT= Facial Recognition Test; JLOT = Judgment of Line Orientation Test. a Comparisons between HC and PD-SCD; b The comparison between HC and PD-MCI was significant. c The comparison between PD-nSCD and PD-MCI was significant. d The comparison between PD-SCD and PD-MCI was significant. e Not significant after Bonferroni correction.

Table 2: Visuospatial and visuoperceptual performance in PD patients (according to side of disease onset) and healthy controls.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | HC (n=19) | ROPD (n=24) | LOPD (n=18) |  |  | HC vs ROPD | | HC vs LOPD | |
| *Variable* | M(SD) | M(SD) | M(SD) | *H* test | *p*-Value | *p*-Value | r | *p*-Value | r |
| *JLOT (total score)* | 13.26(1.37) | 10.92(3.32) | 11.00(3.82) | 6.265 | .044 c | .051 | .36 |  |  |
| QO | 81.59(30.31) | 81.90(20.33) | 81.91(22.79) | .522 | .770 |  |  |  |  |
| QO1 | 77.30(36.98) | 60.38(34.76) | 72.86(28.90) | 3.401 | .183 |  |  |  |  |
| QO2 | 4.29(13.17) | 11.67(13.24) | 7.92(12.30) | 4.503 | .105 |  |  |  |  |
| QO3 | 0.00(0.00) | 9.55(22.68) | 1.13(2.90) | 5.263 | .072 |  |  |  |  |
| QO4 | 0.00(0.00) | 0.30(1.42) | 0.00(0.00) | 1.318 | .517 |  |  |  |  |
| V | 3.17(9.12) | 2.12(7.53) | 2.22(5.91) | .243 | .886 |  |  |  |  |
| H | 15.24(29.68) | 7.61(13.63) | 7.97(14.28) | .131 | .937 |  |  |  |  |
| IQO | 0.00(0.00) | 7.80(12.72) | 7.90(15.92) | 5.695 | .058 |  |  |  |  |
| IQOH | 0.00(0.00) | 0.57(2.67) | 0.00(0.00) | 1.318 | .517 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| *FRT (total score)* | 22.37(2.09) | 20.25(2.05) | 20.22(2.44) | 10.666 | .005 a b | .010 | .45 | .017 | .45 |
| Simple error | 0.00(0.00) | 3.46(6.74) | 4.44(9.06) | 5.011 | .082 |  |  |  |  |
| Side view error | 37.17(19.98) | 42.76(15.60) | 41.78(10.86) | 2.019 | .364 |  |  |  |  |
| Light view error | 62.83(19.98) | 53.78(16.63) | 53.78(11.00) | 4.148 | .126 |  |  |  |  |

*Note.* n = number of the sample in each group; HC = healthy controls; ROPD = right-onset Parkinson’s disease; LOPD = left-onset Parkinson’s disease; M = mean; SD = standard deviation; JLOT = Judgment of Line Orientation Test; FRT= Facial Recognition Test. a The comparison between HC and ROPD was significant. b The comparison between HC and LOPD was significant. c HC vs ROPD notsignificant after Bonferroni correction.

Table 3: Baseline demographic data and clinical characteristics of PD patients converted to dementia in the follow-up study.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | PDD (n=15) | PDND (n=23) |  |  |  |
| *Variable* | M(SD) | M(SD) | U-Value | *p*-Value | r |
| Age (years) | 64.67(6.07) | 55.39(10.32) | 274.000 | .002 | .49 |
| Education (years) | 7.80(3.45) | 8.09(2.47) | 152.000 | .555 |  |
| MMSE | 26.73(1.71) | 28.04(1.67) | 99.000 | .028 | .36 |
| Information (WAIS-III) | 11.93(6.45) | 13.09(5.49) | 141.500 | .359 |  |
| BDI score | 12.53(7.69) | 12.61(10.09) | 180.500 | .813 |  |
| UPDRS Motor Score | 29.87(11.38) | 26.73(15.45) | 195.500 | .350 |  |
| Side of onset (% of right) | 46.7 | 65.2 a |  |  |  |
| Age at onset | 55.07(7.54) | 48.35(9.79) | 240.00 | .044 | .33 |
| Years since diagnosis | 9.60(6.69) | 7.04(6.49) | 223.500 | .129 |  |

*Note.* n = number of the sample in each group; PDD = PD patients with dementia in the follow-up study; PDND = PD patients without dementia in the follow-up study; M = mean; SD = standard deviation; MMSE = Mini-Mental State Examination; WAIS-III = Wechsler Adult Intelligence Scale third edition; BDI = Beck Depression Inventory; UPDRS = [Unified Parkinson's Disease Rating Scale](https://www.google.es/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0CCkQFjABahUKEwiwnezP8N_IAhXDORQKHQ5IChs&url=http%3A%2F%2Fgetm.sen.es%2Fescalas-de-valoracion%2Funified-parkinsons-disease-rating-scale-updrs%2F&usg=AFQjCNFkuJaAQW4ZPAYCdp7Eg-5Jt3OOVw&bvm=bv.105841590,d.bGg); a Pearson’s chi-squared test was not significant.

Table 4: Baseline neuropsychological assessment of PD patients converted to dementia in the follow-up study.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | PDD (n=15) | PDND (n=23) |  |  |  |
| *Variable* | M(SD) | M(SD) | U-Value | *p*-Value | r |
| *Attention–working memory* |  |  |  |  |  |
| Digit Span backward | 3.47(0.99) | 3.78(1.04) | 109.500 | .059 |  |
| Stroop test-Word | 65.60(22.95) | 87.17(20.00) | 260.500 | .007 | .43 |
| Stroop test-Color | 46.60(12.33) | 57.91(13.81) | 252.500 | .016 | .39 |
| Stroop test-Word-color | 24.93(9.92) | 31.39(10.78) | 229.000 | .095 |  |
| Stroop test-Interference | -1.91(7.46) | -3.23(6.75) | 162.500 | .768 |  |
|  |  |  |  |  |  |
| *Executive functions* |  |  |  |  |  |
| WCST (categories) | 1.13(0.915) | 2.57(2.19) | 234.500 | .064 |  |
| Letter fluency | 19.20(10.37) | 24.04(9.05) | 229.000 | .095 |  |
| Animals | 14.73(2.46) | 16.35(4.01) | 213.000 | .235 |  |
|  |  |  |  |  |  |
| *Learning and memory* |  |  |  |  |  |
| CVLT-Total learning | 42.13(9.56) | 50.00(10.42) | 243.000 | .035 | .34 |
| CVLT-Delay | 7.60(3.02) | 11.61(2.45) | 295.500 | .000 | .60 |
| CVLT-Delay (semantic cued) | 8.20(2.18) | 12.09(2.37) | 307.500 | .000 | .66 |
| 8/30 SRT-Total learning | 20.50(6.47) | 27.96(6.15) | 255.000 | .003 | .49 |
| 8/30-Delay | 4.21(2.36) | 5.13(1.96) | 199.500 | .231 |  |
|  |  |  |  |  |  |
| *Visuospatial functions* |  |  |  |  |  |
| FRT | 19.33(1.95) | 20.74(2.09) | 238.000 | .051 |  |
| JLOT | 9.27(4.33) | 11.87(2.74) | 232.000 | .078 |  |
| Block design | 9.43(6.77) | 12.35(6.71) | 202.500 | .196 |  |
|  |  |  |  |  |  |
| *Language* |  |  |  |  |  |
| Naming test | 15.80(2.81) | 18.17(1.97) | 277.500 | .001 | .52 |

*Note.* n = number of the sample in each group; PDD = PD patients with dementia in the follow-up study; PDND = PD patients without dementia in the follow-up study; M = mean; SD = standard deviation; WCST = Wisconsin Card Sorting Test; CVLT = California Verbal Learning Test; 8/30 SRT = 8/30 Spatial Recall Test; FRT= Facial Recognition Test; JLOT = Judgment of Line Orientation Test.

Table 5: Logistic regression model with PD dementia as the dependent variable.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Variable* | *b* | *Wald* | OR | 95% CI | *p* |
| Age ≥ 65 | 2.255 | 6.196 | 9.533 | 1.615 – 56.265 | .013 |
| QO2-IQO errors | 2.598 | 5.599 | 13.436 | 1.562 – 115.562 | .018 |

*Note:* Forward stepwise method was employed. PD-MCI diagnosis, Information subtest, PD duration, age at onset of the disease, UPDRS motor score, and side of disease onset did not reach statistical significance and were excluded to the logistic regression. Model parameters: Cox and Snell R2=.29, Chi-squared statistic=12.825, *p*=.002; OR=Odds Ratio; CI=Confidence Interval.