**Supplementary Table 1.** Estimated marginal means (95% confidence interval) from mixed effects analyses of cognitive and physical function with pairwise comparisons for time (baseline, 2-, 4-, and 6-years follow-up) for each cognitive group [MCI (n=92), cognitively fluctuating (n=157) and cognitively normal (n=232)].

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Baseline |  | 2 years follow-up |  | 4 years follow-up |  | 6 years follow-up |
| Cognitive performance |  |  |  |  |  |  |  |  |
| MMSE |  |  |  |  |  |  |  |  |
| MCI | n=92 | 27.6 (27.3, 27.9) d\* | n=74 | 27.3 (27.0, 27.6) | n=62 | 27.3 (27.0, 27.7) | n=24 | 26.7 (26.1, 27.2) a\* |
| Cognitively fluctuating | n=157 | 28.2 (28.0, 28.4) b\* | n=131 | 28.6 (28.3, 28.8) a\*,d\*\* | n=118 | 28.3 (28.1, 28.6) | n=62 | 27.9 (27.5, 28.2) b\*\* |
| Cognitively normal | n=232 | 28.7 (28.6, 28.9) | n=190 | 28.9 (28.7, 29.1) | n=144 | 28.8 (28.6, 29.1) | n=78 | 28.8 (28.5, 29.1) |
| TMT-A |  |  |  |  |  |  |  |  |
| MCI | n=89 | 50.6 (47.5, 53.8) c\*\*\* | n=69 | 54.0 (50.6, 57.5) c\*\* | n=61 | 61.0 (57.3, 64.7) a\*\*\*,b\*\* | n=24 | 57.2 (51.7, 62.7) |
| Cognitively fluctuating | n=157 | 43.3 (40.9, 45.6) c\*,d\*\*\* | n=131 | 44.5 (42.0, 47.1) d\*\* | n=117 | 47.7 (45.1, 50.4) a\* | n=60 | 51.0 (47.5, 54.6) a\*\*\*,b\*\* |
| Cognitively normal | n=232 | 39.9 (37.9, 41.8) | n=190 | 41.9 (39.8, 44.0) | n=144 | 43.1 (40.7, 45.5) | n=78 | 43.2 (40.1, 46.3) |
| TMT diff† |  |  |  |  |  |  |  |  |
| MCI | n=87 | 92.5 (83.3, 101.7) c\*\*,d\*\*\* | n=67 | 101.0 (90.8, 111.1) d\*\*\* | n=58 | 113.3 (102.5, 124.2) a\*\*,d\*\*\* | n=23 | 153.2 (136.9, 169.4) a\*\*\*,b\*\*\*,c\*\*\* |
| Cognitively fluctuating | n=156 | 71.7 (64.8, 78.6) c\*\*\* | n=129 | 80.2 (72.8, 87.6) c\* | n=116 | 93.6 (85.9, 101.3) a\*\*\*,b\* | n=59 | 86.2 (75.9, 96.5) |
| Cognitively normal | n=228 | 54.1 (48.4, 59.8) | n=186 | 55.0 (48.9, 61.2) | n=143 | 61.3 (54.4, 68.1) | n=78 | 66.4 (57.4, 75.3) |
| LM delayed recall |  |  |  |  |  |  |  |  |
| MCI | n=92 | 7.0 (6.3, 7.7) | n=73 | 7.0 (6.3, 7.8) | n=61 | 6.8 (6.0, 7.6) | n=24 | 6.0 (4.8, 7.2) |
| Cognitively fluctuating | n=157 | 9.4 (8.9, 10.0) | n=131 | 9.4 (8.8,10.0) | n=116 | 9.3 (8.7, 9.9) | n=62 | 9.1 (8.3, 9.9) |
| Cognitively normal | n=232 | 11.6 (11.2, 12.1) | n=190 | 11.4 (10.9, 11.8) | n=144 | 11.6 (11.1, 12.2) | n=78 | 11.3 (10.7, 12.0) |
| Physical performance |  |  |  |  |  |  |  |  |
| TUG |  |  |  |  |  |  |  |  |
| MCI | n=88 | 9.6 (9.1, 10.1) c\*\*\*,d\* | n=72 | 10.1 (9.6, 10.7) | n=57 | 10.7 (10.1, 11.3) a\*\*\* | n=23 | 10.9 (10.1, 11.8) a\* |
| Cognitively fluctuating | n=151 | 9.1 (8.7, 9.5) b\*\*,c\*\*\*,d\* | n=125 | 9.7 (9.3, 10.1) a\*\* | n=109 | 9.9 (9.5, 10.4) a\*\*\* | n=57 | 9.9 (9.4, 10.5) a\* |
| Cognitively normal | n=215 | 8.8 (8.5, 9.2) b\*,c\* | n=185 | 9.3 (8.9, 9.6) a\* | n=130 | 9.4 (9.0, 9.8) a\* | n=77 | 9.4 (8.9, 9.9) |
| Knee extension strength |  |  |  |  |  |  |  |
| MCI | n=92 | 26.1 (24.3, 28.0) b\*,c\*\*\* | n=74 | 28.7 (26.8, 30.6) a\*,c\*\*\*,d\*\*\* | n=63 | 21.7 (19.7, 23.8) a\*\*\*,b\*\*\* | n=24 | 22.1 (19.2, 25.1) b\*\*\* |
| Cognitively fluctuating | n=157 | 28.7 (27.3, 30.1) c\*\*\*,d\*\*\* | n=128 | 30.3 (28.8, 31.7) c\*\*\*,d\*\*\* | n=117 | 24.9 (23.3, 26.4) a\*\*\*,b | n=61 | 24.3 (22.4, 26.2) a\*\*\*,b\*\*\* |
| Cognitively normal | n=232 | 29.1 (27.9, 30.2) c\*\*\*,d\* | n=189 | 29.8 (28.6, 31.0) c\*\*\*,d\*\*\* | n=143 | 24.8 (23.5, 26.2) a\*\*\*,b\*\*\* | n=78 | 26.4 (24.7, 28.1) a\*,b\*\*\* |
| Coordinated stability |  |  |  |  |  |  |  |  |
| MCI | n=92 | 16.4 (14.2, 18.7) | n=72 | 16.6 (14.2, 18.9) | n=61 | 16.8 (14.2, 19.3) | n=24 | 16.3 (12.6, 19.9) |
| Cognitively fluctuating | n=157 | 13.6 (11.9, 15.3) | n=128 | 12.1 (10.3, 13.9) | n=115 | 11.6 (9.7, 13.5) | n=60 | 14.0 (11.6, 16.4) |
| Cognitively normal | n=231 | 12.2 (10.8, 13.6) | n=188 | 10.7 (9.2, 12.1) | n=141 | 11.7 (10.1, 13.4) | n=76 | 11.2 (9.1, 13.4) |
| PPA |  |  |  |  |  |  |  |  |
| MCI | n=92 | 0.88 (0.71, 1.05) | n=74 | 0.84 (0.65, 1.02) | n=63 | 1.04 (0.84, 1.23) | n=24 | 0.74 (0.45, 1.04) |
| Cognitively fluctuating | n=157 | 0.78 (0.65, 0.91) | n=128 | 0.86 (0.72, 1.00) | n=117 | 0.88 (0.73, 1.02) | n=61 | 0.96 (0.78, 1.15) |
| Cognitively normal | n=232 | 0.65 (0.54, 0.76) c\* | n=189 | 0.70 (0.59, 0.82) | n=143 | 0.84 (0.71, 1.00) a\* | n=78 | 0.62 (0.45, 0.78) |

**Note:** LM = logical memory, MCI = mild cognitive impairment, MMSE = Mini-Mental State Examination, PPA = Physiological Profile Assessment, TMT**-**A = Trail Making Test A, TMT diff = Trail Making Test difference (TMT diff = TMT-B time minus TMT-A time), TUG = Timed Up and Go.

Higher scores represent better performance for MMSE, LM delayed recall, and knee extension strength. Lower scores represent better performance for TMT**-**A, TMT diff, TUG, coordinated stability, and PPA score.

asignificantly different to baseline, bsignificantly different to 2-year assessment, csignificantly different to 4-year assessment, dsignificantly different to 6-year assessment.

\* ≤0.05, \*\* ≤0.01, \*\* ≤0.001

|  |  |  |  |
| --- | --- | --- | --- |
| Characteristic, n(%) or mean ± SD | MCI | Cognitively fluctuating | Cognitively normal |
| Non-multiple fallers (n=70) | Multiple fallers (n=21) | Non-multiple fallers (n=130) | Multiple fallers (n=23) | Non-multiple fallers (n=199) | Multiple fallers (n=29) |
| Age (y) | 78.4 ± 4.7 | 80.3 ± 5.3 | 78.4 ± 4.5 | 79.8 ± 3.6 | 77.8 ± 4.4 | 77.2 ± 4.8 |
| Female (%) | 37 (53) | 5 (24) | 65 (50) | 6 (26) | 118 (59) | 19 (66) |
| Education (y) | 11.4 ± 3.6 | 13.0 ± 4.2 | 11.9 ± 3.6 | 12.1 ± 4.4 | 11.8 ± 3.3 | 11.9 ± 3.3 |
| Number of years follow-up (y)  | 3.5 ± 1.6 | 3.4 ± 1.4 | 3.9 ± 1.6 | 3.7 ± 1.3 | 3.6 ± 1.6 | 3.5 ± 1.5 |
| Cognitive performance |  |  |  |  |  |  |
| MMSE | 27.5 ± 1.5 | 27.4 ± 2.0 | 28.2 ± 1.4 | 27.9 ± 1.7 | 28.7 ± 1.2 | 29.0 ± 0.9 |
| TMT-A | 52.4 ± 21.1 | 48.8 ± 16.8 | 43.6 ± 12.5 | 44.5 ± 13.5 | 39.6 ± 10.8 | 39.8 ± 11.3 |
| TMT diff† | 98.8 ± 48.6 | 79.7 ± 43.8 | 72.0 ± 35.7 | 78.5 ± 37.6 | 53.3 ± 27.8 | 60.1 ± 26.9 |
| LM delayed recall | 7.1 ± 3.4 | 6.2 ± 4.1 | 9.6 ± 3.5 | 8.0 ± 3.4 | 11.7 ± 3.4 | 11.6 ± 3.4 |
| Physical performance |  |  |  |  |  |  |
| TUG | 9.8 ± 2.6 | 9.3 ± 2.0 | 9.1 ± 2.2 | 8.9 ± 2.4 | 8.8 ± 2.2 | 9.0 ± 2.8 |
| Knee extension strength | 26.0 ± 11.1 | 28.1 ± 8.5 | 28.7 ± 10.9 | 30.9 ± 12.1 | 28.3 ± 11.7 | 29.3 ± 12.1 |
| Coordinated stability | 17.3 ± 13.3 | 13.5 ± 12.0 | 13.8 ± 11.2 | 13.0 ± 13.0 | 12.6 ± 11.4 | 12.2 ± 13.1 |
| PPA | 0.96 ± 1.06 | 0.77 ± 0.91 | 0.76 ± 0.85 | 1.08 ± 0.78 | 0.62 ± 0.82 | 0.79 ± 1.1 |

**Supplementary Table 2.** Baseline characteristics of non-multiple fallers and multiple fallers in MCI (n=92), cognitively fluctuating (n=157) and cognitively normal (n=232) groups.

**Note:** LM = logical memory, MCI = mild cognitive impairment, MMSE = Mini-Mental State Examination, PPA = Physiological Profile Assessment, TMT**-**A = Trail Making Test A, TMT diff = Trail Making Test difference, TUG = Timed Up and Go, y = years. Higher scores represent better performance for MMSE, LM delayed recall, and knee extension strength. Lower scores represent better performance for TMT**-**A, TMT diff†, TUG, coordinated stability, and PPA score.

†TMT diff = TMT-B time minus TMT-A time