**Supplemental Digital Content 3**

**Supplemental Table 2.** Neuropsychological Assessments for the PLACEBO (PLC), Topiramate (TOP), and Zonisamide Groups.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | PLC |  |  | TOP |  | ZON |  |
|  |  | *Base* |  | *Wk12* | *Base* | *Wk12* | *Base* | *Wk12* |
| Working Memory |  |  |  |  |  |  |  |
| *WMS-III Spatial Span* |  |  |  |  |  |  |  |
| Forward |   | 7.8 (0.4) |  |  8.3 (0.4) |  9.1 ( 0.3) | 6.6 (0.5)\* |  8.4 (0.4) |  6.8 (0.6)\* |
| Backward |  | 8.1 (0.6) |  |  7.4 (0.5) |  8.1 (0.5) | 6.7 (0.6) |  7.5 (0.6) |  6.3 (0.6) |
| Total |   | 15.9 (0.9) |  | 15.7 (0.8) | 17.3 (0.8) | 13.3 (0.9)\* | 15.9 (0.8) | 13.1 (1.1) |
| Age Adjusted |   | 10.8 (0.8) |  | 10.4 (0.8) | 12.0 (0.6) | 8.4 (0.7)\* | 10.8 (0.7) |  7.9 (0.9) |
| *WMS-III Digit Span* |  |  |  |  |  |  |  |
| Forward |  | 11.6 (0.5) |  | 12.2 (0.8) | 11.5 (0.6) |  8.2 (0.4)\* | 11.8 (0.7) |  9.8 (0.6)\* |
| Backward |   | 8.8 (0.5) |  |  8.8 (0.6) |  8.1 (0.4) |  5.5 (0.4)\* |  7.7 (0.4) |  6.8 (0.7) |
| Total |  | 20.4 (1.0) |  | 20.9 (1.2) | 19.6 (0.8) | 13.7 (0.6)\* | 19.5 (1.0) | 16.6 (1.2) |
| Age Adjusted |  | 12.6 (0.7) |  | 13.0 (0.9) | 12.1 (0.6) |  7.7 (0.6)\* | 11.8 (0.8) | 10.0 (0.9) |
| Executive Function |  |  |  |  |  |  |  |
| *STROOP* |  |  |  |  |  |   |   |
| Word T |  | 44.7 (2.7) |  | 47.9 (2.8) | 44.6 (2.6) | 41.4 (2.3) | 45.1 (2.5) | 38.5 (3.2)\* |
| Color T |  | 47.0 (2.3) |  | 48.4 (2.9) | 47.0 (2.9) | 47.7 (2.1) | 47.3 (3.4) | 44.6 (2.8) |
| ColorWord |  | 53 (2.6) |  | 54.3 (2.8) | 51.2 (1.8) | 59.3 (2.5) | 52.5 (3.1) | 53.2 (3.1) |
| Interference |  | 53.8 (1.5) |  | 53.6 (1.4) | 51.6 (1.3) | 61.0 (1.7)\* | 52.3 (2.4) | 55.8 (2.4) |
| *Trail Making Test* |  |  |  |  |  |  |  |
| Trail B |  | 60.9 (6.4) |  | 48.1 (4.4) | 60.9 (3.7) | 70.7 (7.1) | 58.2 (4.7) | 71.8 (6.2)\* |
| *Wisconsin Card Sort* |  |  |  |  |  |  |  |
| Categories |  | 5.5 (0.4) |  |  5.4 (0.4) |  4.8 (0.5) |  5.3 (0.4) |  5.8 (0.2) |  6 (0.0) |
| Total Error T |  | 50.3 (2.6) |  | 51.6 (2.4) | 41.6 (3.3) | 50.3 (3.1) | 50.8 (1.8) | 48.4 (3.6) |
| Perserv T |  | 51.5 (2.8) |  | 52.0 (1.5) | 40.8 (3.8) | 50.6 (3.3) | 49.8 (1.5) | 48.3 (4.0) |
| Concept T |  | 50.7(2.8) |  | 51.8 (2.3) | 41.6 (3.2) | 50.3 (3.3) | 50.0 (1.8) | 54.3 (3.3) |

\* p<0.01 for group X time interaction for paired comparisons with the placebo group; Stroop Test:Color T= Stroop Color Naming T Score; ColorWord= Stroop Color-Word Trial T Score; Interference= Stroop Color-Word Interference Index; WordT= Stroop Word Reading T Score; Wisconsin Card Sort Test:Categories= WCST Categories Completed; Concept T= WCST Conceptual Level Responses T Score; Perserv T= WCST Perseverative Responses T Score; Total Error= WCST Total Errors T Score.

**Supplemental Table 2.** Neuropsychological Assessments (con’t)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | PLC |  |  | TOP |  | ZON |  |
|  |  | *Base* |  |  *Wk12* | *Base* | *Wk12* | *Base* | *Wk12* |
| Verbal Fluency |  |  |  |  |  |  |  |
| *COWAT* |  |  |  |  |  |  |  |
| Phonetic Total |  | 47.4 (2.8) |  | 50.0 (2.4) | 43.4 (3.8) | 28.1 (2.0)\* | 46.5 (3.1) | 32.5 (2.2)\* |
| Semantic Total |  | 21.6 (1.2) |  | 20.8 (0.7) | 21.9 (1.3) | 17.0 (1.2)\* | 22.6 (1.1) | 17.4 (0.7)\* |
| Verbal Memory |  |  |  |  |  |  |  |
| AVLTot |  | 52.1 (2.3) |  | 56.5 (2.5) | 54.9 (2.0) | 49.5 (2.0)\* | 55.6 (2.3) | 50.7 (1.4)\* |
| AVLTB |  | 6.5 (0.4) |  |  6.4 (0.6) |  6.4 (0.5) |  6.8 (0.5) |  6.4 (0.4) |  6.9 (0.5) |
| AVLT7 |  | 11.1 (0.7) |  | 11.5 (0.7) | 11.5 (0.7) | 9.7 (0.9) | 11.3 (0.9) | 10.2 (0.6) |
| AVLT8 |  | 14.1 (0.3) |  | 14.1 (0.3) | 14.0 (0.3) | 12.9 (0.6) | 14.3 (0.3) | 13.9 (0.4) |
| Visual Memory |  |  |  |  |  |  |  |
| ReyDelay T |   | 38.3 (3.2) |  | 43.1 (3.6) | 38.2 (4.1) | 42.5 (4.5) | 42.3 (3.2) | 41.2 (3.6) |
| ReyRe T |  | 44.6 (3.2) |  | 51.8 (2.7) | 47.5 (3.6) | 38.6 (3.7)\* | 48.4 (2.2) | 47.6 (1.3) |
| Psychomotor Function, Visual Motor Tracking, Fine motor control. |  |  |  |  |  |  |  |
| Trail A |  | 27.6 (2.6) |  | 22.3 (1.1) | 33.4 (3.7) | 31.0 (2.6) | 26.1 (1.8) | 28.9 (2.0) |
| Symbol Digit |  | 53.5 (3.1) |  | 55.1 (2.6) | 50.0 (2.2) | 47.3 (2.6) | 51.3 (2.0) | 45.5 (2.2) |
| PegDom |  | 66.9 (4.2) |  | 65.4 (3.6) | 81.1 (11) | 79.7 (6.5) | 65.1 (2.1) | 69.1 (4.6) |
| PegNoDom |  | 76.3 (4.3) |  | 71.3 (4.8) | 89.7 (12) | 93.5 (11)\* | 70.5 (3.3) | 75.5 (4.0)\* |
| AB-Neurotox  |  | *Wk 1* |  | *Wks 11-12* | *Wk 1* | *Wks 11-12* | *Wk 1* | *Wks 11-12* |
| Total |  | 11.3 (2.3) |  | 5.8 (1.6) | 14.8 (2.2) | 15.4 (3.3) | 15.3 (3.1) | 7.1 (2.2) |
| Memory  |   | 2.5 (0.5) |  | 1.0 (0.3) | 3.1 (0.4) |  3.1 (0.7) | 3.2 (0.5) | 1.1 (0.4) |
| Mental Slowing |   | 2.0 (0.5) |  | 1.4 (0.5) | 2.8 (0.5) |  4.0 (0.9)\* | 3.0 (0.7) | 1.5 (0.5) |

\* p<0.01 for group X time interaction for paired comparisons with the placebo group**;** AVLT:AVLT7= RAVLT Short Delay Free Recall Total Score; AVLT8= RAVLT Long Delay Free Recall Total Score ; AVLTB = RAVLT Long Delay Free Recall Total Score ; AVLTot = RAVLT Trials 1-5 Total Score; Pegboard: PegDom= Grooved Pegboard Dom, Time to complete; PegNoDom= Grooved Pegboard NonDom, Time to complete; Rey-Osterrieth: ReyDelay T= Rey-Osterrieth Delayed Free Recall T Score; ReyRe T= Rey-Osterrieth Delayed Recognition T Score; Symbol Digit Modality:Symbol Digit= Symbol Digit Coding Test, T Score.