Supplementary Table 1: Cognitive performance in patients with and without prior overt HE

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| --- | --- | --- | --- | --- |
|  | Combined | VA | OH | AR |
|  | OHE-(n = 277) | OHE+(n= 155) | p-value | OHE-(n =132) | OHE+(n = 93) | p-value | OHE-(n = 75) | OHE+(n = 32) | p-value | OHE-(n = 70) | OHE+(n = 30) | p-value |
| PHES components |
| NCT-A | 31.00(26.00, 42.00) | 38.00(28.00, 50.00) | 0.0009 | 31.00(26.00, 44.00) | 40.00(31.00, 58.00) | 0.001 | 31.00(25.00, 37.00) | 28.50(24.00, 36.50) | 0.15 | 31.43(24.76, 39.91) | 41.23(29.96 47.62) | 0.01 |
| NCT-B | 75.68(59.00, 109.00) | 94.00(69.90, 125.00) | <0.0001 | 78.50(59.00, 114.50) | 104.00(76.00, 144.00) | 0.0002 | 89.00(72.00, 115.00) | 97.00(80.50, 122.50) | 0.35 | 63.62(53.62, 78.29) | 68.99(64.84, 92.18) | 0.05 |
| DST | 50.00(43.00, 62.00) | 46.00(39.00, 54.00) | <0.0001 | 56.50(43.00, 69.00) | 46.00(34.00, 54.00) | <0.0001 | 51.00(42.00, 63.00) | 49.50(40.50, 60.50) | 0.46 | 45.00(43.00, 49.00) | 44.00(41.00, 46.00) | 0.04 |
| LTT | 119.62(99.00, 143.00) | 136.00(111.66, 172.00) | <0.0001 | 123.00(106.00, 150.00) | 147.00(125.00, 187.00) | 0.0001 | 110.00(95.00, 134.00) | 114.00(91.00, 138.50) | 0.90 | 113.61(94.31, 139.20) | 133.27(116.97, 160.92) | 0.003 |
| SDT | 66.00(55.00, 81.14) | 76.15(59.00, 96.00) | <0.0001 | 58.50(50.00, 75.00) | 76.00(58.00, 96.00) | <0.0001 | 67.00(57.00, 82.00) | 67.00(58.50, 86.00) | 0.62 | 75.95(65.11, 85.41) | 82.60(74.48, 97.55) | 0.01 |
| ICT components |
| ICT Lures | 11.50(5.00, 19.00) | 13.00(7.00, 21.00) | 0.05 | 7.00(3.00, 14.00) | 10.00(6.00, 18.00) | 0.006 | 15.00(8.00, 22.00) | 14.00(9.50, 22.00) | 0.83 | 14.00(10.00, 22.00) | 19.00(11.00, 23.00) | 0.33 |
| ICT % Targets | 96.85(91.00, 99.00) | 94.81(88.00, 98.00) | 0.004 | 98.58(96.70, 99.53) | 96.70(92.45, 98.58) | 0.0001 | 95.00(90.00, 98.00) | 94.00(86.50, 96.00) | 0.14 | 91.51(87.50, 95.99) | 91.741(79.71, 94.81) | 0.41 |
| EncephalApp |
| OffTime | 82.71(70.47, 92.97) | 90.71(78.94, 101.65) | <0.0001 | 79.40(66.57, 90.69) | 92.22(77.80, 109.06) | <0.0001 | 83.93(70.47, 97.49) | 85.62(74.72, 100.33) | 0.45 | 86.92(80.50, 95.18) | 89.42(81.56, 99.59) | 0.28 |
| OnTime | 96.84(82.68, 109.57) | 104.78(90.19, 123.94) | <0.0001 | 96.87(79.63, 109.57) | 108.66(92.16, 130.00) | <0.0001 | 97.26(84.81, 117.89) | 106.32(85.03, 129.57) | 0.49 | 96.21(88.03, 101.74) | 97.19(90.30, 103.04) | 0.65 |
| OffTime+OnTime | 180.63(153.51, 200.43) | 195.88(168.10, 221.39) | <0.0001 | 178.63(145.17, 196.97) | 200.50(173.27, 237.57) | <0.0001 | 183.94(155.69, 210.36) | 192.55(162.58, 229.00) | 0.43 | 183.12(169.90, 195.29) | 182.84(175.42, 198.54) | 0.40 |
| OnTime – OffTime | 14.44(5.87, 21.14) | 12.95(7.27, 25.58) | 0.27 | 15.56(8.64, 21.90) | 16.53(9.19, 29.05) | 0.13 | 15.15(8.61, 23.15) | 14.43(7.20, 31.08) | 0.98 | 7.88(-0.04, 16.31) | 6.75(2.79, 10.21) | 0.57 |
| No. of Off runs | 6.00(5.00, 6.00) | 6.00(5.00, 7.00) | 0.62 | 5.00(5.00, 6.00) | 5.00(5.00, 6.00) | 0.70 | 5.00(5.00, 7.00) | 6.00(5.00, 7.00) | 0.29 | 6.00(5.00, 7.00) | 6.50(6.00, 7.00) | 0.11 |
| No. of On runs  | 6.00(5.00, 7.00) | 6.00(5.00, 7.00) | 0.19 | 5.00(5.00, 7.00) | 6.00(5.00, 7.00) | 0.23 | 6.00(5.00, 8.00) | 6.00(5.00, 7.00) | 0.92 | 7.00(6.00, 7.00) | 7.00(6.00, 8.00) | 0.03 |

Notes: 1) Median (IQR)

 2) Tests done using Mann-Whitney U test (Wilcoxon Rank-Sum test)

Supplementary Table 2: Individual test results in the validation cohort; data is presented as median (IQR)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Combined(n = 121) | No prior overt HE(n = 76) | Prior overt HE(n = 45) | p-value |
| NCT-A (seconds) | 40.00(30.00, 54.00) | 35.00(26.00, 46.00) | 51.00(38.00, 65.00) | <0.0001 |
| NCT-B (seconds) | 104.00(73.00, 140.00)  | 86.00(65.00, 115.00) | 128.00(100.00, 176.00) | <0.0001 |
| DST (raw score) | 48.00(39.00, 58.00) | 54.00(44.00, 66.50) | 42.00(34.00, 49.00) | <0.0001 |
| SDT (seconds) | 68.00(54.00, 91.00) | 64.50(52.00, 77.00) | 87.00(67.00, 121.00) | <0.0001 |
| LTTe+Time (number+seconds) | 137.00(111.00, 163.00) | 126.00(107.00, 156.00) | 155.00(129.00, 190.00) | 0.0005 |
| ICT Lures (number) | 7.00(6.00, 9.00) | 7.00(6.00, 9.00) | 8.00(6.00, 12.00) | 0.12 |
| ICT % Targets | 96.70(92.92, 99.06) | 97.17(93.87, 99.06) | 95.28(90.57, 98.58) | 0.10 |
| OffTime (seconds) | 85.35(73.23, 98.30) | 80.31(70.92, 91.08) | 95.47(80.71, 114.73) | <0.0001 |
| OnTime (seconds) | 100.62(87.77, 121.54) | 96.00(83.16, 109.44) | 110.57(100.39, 135.05) | <0.0001 |
| OffTime+OnTime (seconds) | 185.94(162.57, (222.94) | 175.31(154.90, 200.89) | 207.58(182.58, 243.72) | <0.0001 |
| OnTime – OffTime (seconds) | 15.54(10.60, 23.59) | 14.65(9.60, 20.68) | 18.12(11.58, 27.08) | 0.02 |
| No. of Off runs | 5.00(5.00, 6.00) | 5.00(5.00, 6.00) | 5.00(5.00, 6.00) | 0.64 |
| No. of On runs | 6.00(5.00, 7.00) | 6.00(5.00, 6.00) | 6.00(5.00, 7.00) | 0.17 |

HE: hepatic encephalopathy, ICT: inhibitory control test, NCT-A: number connection test-A, NCT-B: number connection test-B, DST: digit symbol test, LTT: line tracing test (errors+time)