**Table S1.** The longitudinal gray matter volume changes of sub-cortical regions, hippocampal, and amygdala sub-regions in the MDD patients before and after ECT for two datasets. The bold fond represents significant difference after Bonferroni corrections (*p* < 0.05/12=4.16×10-3 for sub-cortical regions, and *p* < 0.05/56=8.92×10-4 for hippocampal and amygdala sub-regions).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Dataset 1** | | | | **Dataset 2** | | |
|  | **Before ECT**  **Mean ± SD** | **After ECT**  **Mean ± SD** | **P value** | **Before ECT**  **Mean ± SD** | **After ECT**  **Mean ± SD** | **P value** |
| **Left Sub\_cortical regions** | | | | | | |
| Thalamus | 8416.52 ±941.3 | 8531.34 ±968.0 | **1.85×10-3** | 7516.51 ±1051.0 | 7599.69 ±1013.8 | 0.022 |
| Caudate | 4777.82±985.96 | 4803.77±1076.2 | 0.566 | 3737.10 ±493.89 | 3766.98 ±495.47 | 0.121 |
| Putamen | 7372.70±1144.5 | 7363.06±1153.0 | 0.870 | 5393.12 ±690.46 | 5417.45 ±719.31 | 0.277 |
| Pallidum | 1413.93±322.36 | 1396.53±316.93 | 0.334 | 1997.65 ±251.26 | 1976.46 ±244.60 | 0.078 |
| Hippocampus\* | 4152.27±380.89 | 4282.09±427.10 | **2.18×10-6** | 4342.06 ±525.67 | 4489.15 ±522.04 | **1.73×10-8** |
| Amygdala\* | 1543.05±230.77 | 1633.18±258.93 | **1.37×10-6** | 1551.61 ±255.75 | 1632.02 ±276.01 | **4.94×10-8** |
| **Right Sub\_cortical regions** | | | | | | |
| Thalamus | 7501.71±705.60 | 7614.79±836.34 | 0.007 | 7291.46 ±997.71 | 7376.56 ±965.95 | 0.014 |
| Caudate | 4283.67±706.03 | 4367.74±736.60 | **3.24×10-6** | 3833.32 ±515.66 | 3865.43 ±532.61 | 0.035 |
| Putamen | 6837.13±1139.2 | 6813.84±1134.4 | 0.731 | 5646.62 ±672.50 | 5707.33 ±706.32 | 0.036 |
| Pallidum | 1437.04±255.02 | 1434.89±275.07 | 0.883 | 2015.15 ±270.59 | 1975.16 ±264.12 | **1.39×10-3** |
| Hippocampus\* | 4291.44±395.62 | 4469.33±439.71 | **2.33×10-7** | 4569.11 ±523.58 | 4690.89 ±515.72 | **1.08×10-9** |
| Amygdala\* | 1569.70±277.96 | 1638.93±271.01 | **1.38×10-3** | 1941.35 ±303.68 | 2021.69 ±319.55 | **3.71×10-9** |
| **Left amygdala sub-regions** | | | | | | |
| LA.L\* | 669.83 ± 79.47 | 690.82 ± 87.47 | **5.01×10-5** | 671.15 ± 98.72 | 689.85 ± 95.6 | **1.28×10-4** |
| BA.L\* | 435.72 ± 54.45 | 453.43 ± 63.64 | **4.47×10-5** | 433.08 ± 559.05 | 446.55 ± 58.81 | **1.76×10-5** |
| AB.L | 269.56 ± 38.04 | 280.07 ± 39.78 | 0.003 | 252.95 ± 40.80 | 261.94 ± 42.24 | **3.47×10-4** |
| AAA.L | 56.72 ± 8.92 | 58.40 ± 8.88 | 0.051 | 52.63 ± 8.35 | 54.85 ± 9.44 | 0.003 |
| CE.L | 42.56 ± 6.65 | 43.19 ± 8.67 | 0.661 | 39.08 ± 8.67 | 39.763 ± 9.00 | 0.263 |
| ME.L | 18.53 ± 4.78 | 18.19 ± 5.93 | 0.599 | 19.17 ± 6.83 | 19.87 ± 6.85 | 0.257 |
| CO.L | 24.68 ± 4.33 | 25.25 ± 4.91 | 0.311 | 22.27 ± 4.66 | 23.19 ± 4.85 | 0.030 |
| CAT.L\* | 169.02 ± 22.87 | 178.60 ± 22.53 | **3.01****×10-6** | 167.78 ± 23.60 | 174.73 ± 24.25 | **1.18×10-5** |
| PA.L\* | 46.720 ± 5.93 | 48.66 ± 6.75 | **6.22×10-6** | 47.93 ± 6.55 | 49.39 ± 6.62 | **2.91×10-4** |
| **Right amygdala sub-regions** | | | | | | |
| LA.R | 679.50 ± 76.50 | 700.10 ± 79.70 | **2.01×10-4** | 682.43 ± 92.56 | 696.83 ± 100.47 | 9.17×10-4 |
| BA.R\* | 432.30 ± 54.85 | 447.89 ± 59.84 | **1.09×10-4** | 462.09 ± 62.74 | 473.67 ± 66.14 | **1.02×10-4** |
| AB.R\* | 267.34 ± 38.29 | 277.76 ± 42.65 | **1.71×10-4** | 283.56 ± 43.07 | 293.74 ± 46.66 | **3.74×10-5** |
| AAA.R | 56.57 ± 10.89 | 58.49 ± 11.37 | 0.015 | 58.68 ± 10.44 | 59.79 ± 10.02 | 0.099 |
| CE.R | 45.67 ± 11.01 | 45.74 ± 9.47 | 0.933 | 45.60 ± 9.41 | 45.41 ± 9.00 | 0.839 |
| ME.R | 16.75 ± 4.60 | 17.14 ± 5.32 | 0.497 | 22.26 ± 6.40 | 21.27 ± 6.25 | 0.089 |
| CO.R | 21.96 ± 5.15 | 22.50 ± 5.06 | 0.106 | 24.96 ± 4.90 | 25.96 ± 5.44 | 0.007 |
| CAT.R\* | 158.77 ± 18.98 | 165.94 ± 22.71 | **1.74×10-5** | 177.12 ± 26.89 | 185.32 ± 29.44 | **3.59×10-8** |
| PA.R\* | 44.36 ± 5.86 | 45.95 ± 6.39 | **2.93×10-4** | 47.70 ± 7.14 | 48.99 ± 7.52 | **7.60×10-5** |
| **Left hippocampal sub-regions** | | | | | | |
| Hippocampal tail | 600.51 ± 69.69 | 605.82 ±77.74 | 0.332 | 597.51 ± 87.46 | 599.16 ± 87.21 | 0.659 |
| Subiculum body | 246.43 ± 31.84 | 244.45 ±30.27 | 0.229 | 248.39 ± 33.21 | 249.75 ± 31.93 | 0.217 |
| CA1 body | 111.97 ± 20.31 | 109.86 ±18.69 | 0.098 | 113.84 ± 20.84 | 113.90 ± 20.22 | 0.942 |
| Subiculum head | 187.96 ± 31.31 | 188.45 ±29.00 | 0.699 | 199.39 ± 35.33 | 200.02 ± 34.58 | 0.450 |
| Hippocampal fissure | 170.06 ±42.82 | 159.39 ±36.91 | 0.001 | 161.92 ± 35.38 | 155.49 ± 31.92 | 0.005 |
| Presubiculum head | 121.29 ±15.07 | 122.52 ±15.91 | 0.318 | 138.99 ± 23.23 | 139.41 ± 22.35 | 0.610 |
| CA1 head | 507.11 ±63.07 | 505.20 ±65.58 | 0.594 | 520.05 ± 81.37 | 521.36 ± 80.87 | 0.541 |
| Presubiculum body | 160.84 ±19.90 | 159.97 ±20.00 | 0.735 | 178.29 ± 23.25 | 175.11 ± 22.67 | 0.021 |
| parasubiculum | 44.75 ±10.05 | 44.96 ±9.71 | 0.770 | 56.400 ± 13.45 | 55.88 ± 12.71 | 0.267 |
| ML-HP head | 313.65 ±35.03 | 316.80 ±37.78 | 0.122 | 328.87 ± 46.67 | 332.30 ± 47.66 | 0.006 |
| ML-HP body | 233.39 ±31.23 | 233.18 ±30.88 | 0.906 | 225.39 ± 27.56 | 225.85 ± 26.56 | 0.642 |
| GC-ML-DG head | 147.65 ±19.55 | 152.67 ±20.58 | 0.001 | 148.90 ± 21.97 | 153.55 ± 22.99 | **8.04×10-8** |
| CA3 body | 107.13 ±24.95 | 106.14 ±23.95 | 0.523 | 93.434 ± 22.52 | 93.37 ± 21.42 | 0.939 |
| GC-ML-DG body | 141.51 ±18.12 | 143.74 ±19.07 | 0.176 | 134.83 ± 16.64 | 136.53 ± 16.85 | 0.035 |
| CA4 head | 124.74 ±17.13 | 129.25 ±18.01 | 0.002 | 124.79 ± 17.91 | 128.75 ± 18.68 | **5.08×10-7** |
| CA4 body | 129.66 ±17.73 | 132.23 ±18.33 | 0.149 | 123.47 ± 16.21 | 125.51 ± 16.29 | 0.015 |
| Fimbria | 82.89 ±19.77 | 84.43 ±19.89 | 0.401 | 75.157 ± 19.32 | 74.67 ± 19.03 | 0.590 |
| CA3 head | 126.88 ±23.99 | 129.81 ±22.69 | 0.023 | 121.06 ± 21.66 | 123.97 ± 21.71 | **3.40×10-4** |
| HATA\* | 60.54 ±13.61 | 63.98 ±11.65 | **5.89×10-4** | 60.480 ± 11.98 | 63.02 ± 10.87 | **2.13×10-6** |
| **Right hippocampal sub-regions** | | | | | | |
| Hippocampal tail | 610.25 ±69.50 | 604.90 ±72.84 | 0.237 | 612.56 ± 78.49 | 610.87 ± 82.19 | 0.688 |
| Subiculum body | 248.72 ±34.14 | 244.87 ±36.29 | 0.007 | 238.99 ± 27.51 | 240.52 ± 28.10 | 0.206 |
| CA1 body | 127.26 ±27.12 | 125.04 ±27.36 | 0.086 | 132.78 ± 23.60 | 131.69 ± 23.50 | 0.222 |
| Subiculum head | 187.47 ±26.02 | 186.37 ±25.19 | 0.449 | 206.95 ± 34.27 | 207.96 ± 33.88 | 0.435 |
| Hippocampal fissure | 172.02 ±37.73 | 164.22 ±34.66 | 0.020 | 160.76 ± 28.62 | 156.51 ± 29.70 | 0.090 |
| Presubiculum head | 118.84 ±18.29 | 118.00 ±18.68 | 0.569 | 149.40 ± 21.54 | 149.43 ± 19.88 | 0.972 |
| CA1 head | 542.38 ±70.98 | 545.66 ±75.75 | 0.399 | 567.58 ± 97.56 | 573.02 ± 100.2 | 0.013 |
| Presubiculum body | 143.98 ±23.98 | 146.38 ±27.14 | 0.332 | 173.90 ± 20.81 | 171.93 ± 20.08 | 0.101 |
| parasubiculum | 46.54 ±14.21 | 47.26 ±15.02 | 0.485 | 62.58 ± 14.58 | 62.78 ± 14.66 | 0.682 |
| ML-HP head | 330.54 ±35.83 | 334.07 ±37.89 | 0.106 | 355.51 ± 52.95 | 360.37 ± 55.05 | 0.008 |
| ML-HP body | 241.62 ±31.96 | 241.66 ±32.99 | 0.974 | 225.58 ± 26.39 | 227.23 ± 25.99 | 0.181 |
| GC-ML-DG head | 156.87 ±20.72 | 160.77 ±19.56 | 0.009 | 159.98 ± 25.63 | 165.33 ± 26.99 | **5.66×10-6** |
| CA3 body | 117.67 ±26.71 | 118.50 ±25.54 | 0.474 | 94.93 ± 18.23 | 95.34 ± 18.84 | 0.652 |
| GC-ML-DG body | 140.76 ±14.70 | 142.31 ±13.31 | 0.228 | 128.34 ± 13.58 | 130.38 ± 13.13 | 0.012 |
| CA4 head | 133.17 ±18.73 | 136.20 ±17.62 | 0.024 | 132.78 ± 19.60 | 136.70 ± 20.58 | **6.66×10-5** |
| CA4 body | 128.11 ±13.70 | 131.05 ±13.21 | 0.020 | 119.45 ± 12.61 | 121.93 ± 12.70 | 0.001 |
| Fimbria | 79.05 ±18.11 | 81.55 ±18.04 | 0.293 | 66.78 ± 12.77 | 67.31 ± 12.97 | 0.543 |
| CA3 head | 134.45 ±23.74 | 136.83 ±20.35 | 0.108 | 128.52 ± 21.23 | 129.93 ± 23.35 | 0.219 |
| HATA\* | 56.84 ±8.88 | 60.26 ±10.26 | **2.90×10-4** | 62.46 ± 12.93 | 65.35 ± 13.67 | **3.27×10-7** |

Abbreviations: LA, lateral nucleus; BA, the basal nucleus; CE, central nucleus; ME, medial nucleus; CO, cortical nucleus; AB, accessory basal nucleus; CAT, corticoamydaloid transition; AAA, anterior amygdaloid area; PA, paralaminar nucleus; CA, cornu ammonis; ML, molecular layer; HP, hippocampal; GC, granule cell; DG, dentate gyrus; and HATA, hippocampus amygdala transition area. \*represents significant results in both datasets.