**S1 Table. Plasma Other sphingolipids, Sphinganines, Gangliosides, Free fatty acids, Acylcarnitnes, Lysophospholipids Levels in Neurodegenerative Diseases.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| cohort A |  |  | cohort B |  |  | cohort B |  |  |
| PD vs CN |  |  | DLB vs CN |  |  | AD vs CN |  |  |
|  | ratio | p value |  | ratio | p value |  | ratio | p value |
| **other sphingolipids** |  |  | **other sphingolipids** |  |  | **other sphingolipids** |  |  |
| C1P | 1.1 | **0.0291**  | C1P | 1.2 | **0.0004**  | C1P | 1.3 | **0.0001**  |
| sphingosine | 0.8 | **0.0436**  | sphingosine | 0.7 | 0.0586  | sphingosine | 0.8 | 0.1119  |
| **sphinganines** |  |  | **sphinganines** |  |  | **sphinganines** |  |  |
| sphinganine | 0.8 | **0.0031**  | sphinganine | 0.8 | **0.0191**  | sphinganine | 0.8 | **0.0248**  |
| SG1P | 0.9 | 0.0535  | SG1P | 0.8 | **0.0312**  | SG1P | 0.8 | **0.0284**  |
| **gangliosides** |  |  | **gangliosides** |  |  | **gangliosides** |  |  |
| GM3 | 1.1 | **0.0169**  | GM3 | 1.2 | **0.0001**  | GM3 | 1.3 | **<0.0001** |
| GD3 | 1.1 | **0.0483**  | GD3 | 1.3 | **<0.0001** | GD3 | 1.4 | **<0.0001** |
| GD1 | 0.9 | 0.1471  | GD1 | 0.9 | 0.0927  | GD1 | 1.1 | 0.3198  |
| **free fatty acids** | 1.6 | **0.0174**  | **free fatty acids** | 1.5 | 0.0502  | **free fatty acids** | 1.2 | 0.2940  |
| **acylcarnitnes** | 1.2 | 0.1048  | **acylcarnitnes** | 1.6 | **0.0014**  | **acylcarnitnes** | 1.4 | 0.0580  |
| **lysophospholipids** |  |  | **lysophospholipids** |  |  | **lysophospholipids** |  |  |
| LPA | 0.9 | **0.0458**  | LPA | 0.7 | **0.0092**  | LPA | 0.9 | 0.3597  |
| LPC | 1 | 0.5986  | LPC | 0.8 | **0.0347**  | LPC | 0.9 | 0.1295  |
| LPE | 1 | 0.5126  | LPE | 0.7 | **0.0034**  | LPE | 0.9 | 0.2807  |
| LPG | 0.9 | **0.0032**  | LPG | 0.8 | **0.0019**  | LPG | 0.9 | 0.0453  |
| LPI | 0.9 | **0.0218**  | LPI | 0.9 | 0.0749  | LPI | 1.1 | 0.3255  |
| LPS | 0.8 | **0.0366**  | LPS | 0.6 | **0.0335**  | LPS | 0.6 | 0.0734  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| cohort C |  |  | cohort C |  |  | cohort C |  |  |
| PD vs CN |  |  | PSP vs CN |  |  | MSA vs CN |  |  |
|  | ratio | p value |  | ratio | p value |  | ratio | p value |
| **other sphingolipids** |  |  | **other sphingolipids** |  |  | **other sphingolipids** |  |  |
| C1P | 1.3 | **0.0245**  | C1P | 1.1 | 0.1851  | C1P | 1.2 | 0.1301  |
| sphingosine | 0.9 | 0.2337  | sphingosine | 0.7 | 0.0669  | sphingosine | 0.8 | 0.0902  |
| **sphinganines** |  |  | **sphinganines** |  |  | **sphinganines** |  |  |
| sphinganine | 0.9 | 0.8344  | sphinganine | 0.8 | 0.0718  | sphinganine | 0.9 | 0.1685  |
| SG1P | 0.7 | 0.0615  | SG1P | 0.7 | 0.0372  | SG1P | 0.7 | 0.0635  |
| **gangliosides** |  |  | **gangliosides** |  |  | **gangliosides** |  |  |
| GM3 | 1.3 | **<0.0001** | GM3 | 1.2 | **0.0005**  | GM3 | 1.2 | **0.0012**  |
| GD3 | 1.5 | **<0.0001** | GD3 | 1.2 | **0.0136**  | GD3 | 1.1 | **<0.0001** |
| GD1 | 0.9 | 0.7283  | GD1 | 1.1 | 0.3171  | GD1 | 1.4 | 0.3579  |
| **free fatty acids** | 1.5 | 0.1049  | **free fatty acids** | 1.4 | 0.2088  | **free fatty acids** | 1.5 | 0.1559  |
| **acylcarnitnes** | 1.1 | 0.2606  | **acylcarnitnes** | 1.2 | 0.2046  | **acylcarnitnes** | 1.3 | 0.1451  |
| **lysophospholipids** |  |  | **lysophospholipids** |  |  | **lysophospholipids** |  |  |
| LPA | 1 | 0.5317  | LPA | 0.7 | **0.0308**  | LPA | 1 | 0.5593  |
| LPC | 0.9 | **0.0335**  | LPC | 0.9 | **0.0427**  | LPC | 0.8 | **0.0128**  |
| LPE | 0.8 | 0.0884  | LPE | 0.8 | 0.0532  | LPE | 0.7 | 0.0113  |
| LPG | 0.8 | 0.0645  | LPG | 0.8 | 0.0461  | LPG | 0.8 | **0.0423**  |
| LPI | 1.1 | 0.1846  | LPI | 1 | 0.5590  | LPI | 1 | 0.5501  |
| LPS | 0.9 | 0.3106  | LPS | 0.7 | 0.1019  | LPS | 0.7 | 0.1078  |

Statistical methods: The metabolite level ratio of IPD, DLB, MSA, AD, or PSP to CNs. Statistical significance was examined using one-tailed Welch's t tests (P < 0.05).

Abbreviations: ceramide-1-phosphate (C1P), sphinganine-1-phosphate (SG1P), lysophosphatidic acid (LPA), lysophosphatidylcholine (LPC), lysophosphatidylethanolamine (LPE), lysophosphatidylglycerol (LPG), lysophosphatidylinositol (LPI), lysophosphatidylserine (LPS)