**Supplementary Tables**

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**Supplemental Table 1. Characteristics Specialized for Diabetes Cohort**

|  |  |  |
| --- | --- | --- |
|  | Total no. with  data available | % |
| Overall diabetes |  |  |
| Known history | 111/132 | 84.1 |
| Newly diagnosed | 21/132 | 15.9 |
| Diabetes duration, years |  |  |
| 0–10 | 100/132 | 75.8 |
| 11–20 | 26/132 | 19.7 |
| >20 | 6/132 | 4.5 |
| Insulin-dependent | 27/132 | 20.5 |
| HbA1c, % |  |  |
| <7 | 45/86 | 52.3 |
| 7–9 | 30/86 | 34.9 |
| >9 | 11/86 | 12.8 |
| GSP, μmol/L |  |  |
| ≤285 | 23/32 | 71.9 |
| ＞285 | 9/32 | 28.1 |

HbA1c, glycated hemoglobin A 1c; GSP, glycated serum proteins.

**Supplemental Table 2. Perioperative Characteristics**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Diabetes  (n = 132) | Non-diabetes  (n = 134) | *P* Value |
| **Anesthesia induction agent** |  |  |  |
| Propofol, mg | 80 (60, 100) | 80 (70, 100) | 0.341 |
| Sufentanil, µg | 24 (15, 25) | 25 (20, 30) | 0.060 |
| Cisatracurium, mg | 12 (10, 14) | 12 (10, 14) | 0.089 |
| Flurbiprofen Axetil, mg | 50 (50, 50) | 50 (50, 50) | 0.231 |
| Dexamethasone, mg | 10 (8, 10) | 10 (10, 10) | 0.542 |
| **Vasoactive drug** |  |  |  |
| Ephedrine |  |  |  |
| No. received | 59 (44.7%) | 68 (50.7%) | 0.323 |
| Dose, mg | 6 (6, 7.5) | 6 (6, 12) | 0.092 |
| Phenylephrine |  |  |  |
| No. received | 42 (31.8%) | 40 (29.9%) | 0.728 |
| Dose, µg | 92 (40, 120) | 70 (40, 160) | 0.627 |
| Norepinephrine |  |  |  |
| No. received | 9 (6.8%) | 7 (5.2%) | 0.585 |
| Dose, µg | 80 (49, 317) | 320 (240, 400) | 0.136 |
| Atropine |  |  |  |
| No. received | 7 (5.3%) | 10 (7.5%) | 0.472 |
| Dose, mg | 0.4 (0.3, 0.5) | 0.5 (0.3, 1.0) | 0.486 |
| Nicardipine |  |  |  |
| No. received | 23 (17.4%) | 16 (11.9%) | 0.206 |
| Dose, mg | 0.8 (0.3, 1.5) | 0.6 (0.4, 0.8) | 0.295 |

**Supplemental Table 3.** **Full Logistic Regression Model Estimating the Association between Preoperative Diabetes and Postoperative Delirium, Adjusting for Covariates (n = 266)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Odds ratio | 95% CI | *P* Value |
| Diabetes | 3.2 | 1.4, 8.0 | 0.009 |
| Age, years | 1.1 | 0.99, 1.1 | 0.115 |
| Sex (female) | 0.8 | 0.3, 2.1 | 0.660 |
| Body mass index | 1.0 | 0.92, 1.2 | 0.608 |
| Education level (per class) | 1.1 | 0.62, 1.9 | 0.731 |
| Hypertension | 0.90 | 0.38, 2.2 | 0.814 |
| Arrhythmia | 1.3 | 0.32, 4.0 | 0.706 |
| Coronary heart disease | 1.0 | 0.14, 4.3 | 0.992 |
| History of stroke | 1.4 | 0.30, 4.9 | 0.630 |

Hosmer-Lemeshow goodness of fit test: χ2 = 7.0, df = 8, *P* Value = 0.536

**Supplemental Table 4. *Mediator Model*, General Linear Regression for Intraoperative Electroencephalography Alpha Power, Adjusting for Covariates (n = 266)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Coefficient | 95% CI | *P* Value | VIF |
| Diabetes | -1.9 | -2.8, -0.91 | <0.001 | 1.05 |
| Age, years | -0.19 | -0.27, -0.10 | <0.001 | 1.11 |
| Sex (female) | 1.9 | 0.80, 3.1 | 0.001 | 1.14 |
| Body mass index | -0.04 | -0.19, 0.11 | 0.594 | 1.09 |
| Education level | -0.30 | -1.0, 0.41 | 0.414 | 1.14 |
| Hypertension | -0.32 | -1.4, 0.74 | 0.553 | 1.14 |
| Arrhythmia | 0.40 | -1.3, 2.1 | 0.615 | 1.05 |
| Coronary heart disease | -0.50 | -2.8, 1.8 | 0.660 | 1.04 |
| History of stroke | -1.2 | -3.0, 0.65 | 0.211 | 1.05 |

VIF, variance inflation factor.

Hosmer-Lemeshow goodness of fit test: χ2 = -23, df = 8, *P* Value = 1.

**Supplemental Table 5. *Outcome Model*, Logistic Regression for Postoperative Delirium, Adjusting for Covariates (n = 266)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Odds ratio | 95% CI | *P* Value |
| Diabetes | 2.6 | 1.1, 6.7 | 0.036 |
| Intraoperative alpha power (dB) | 0.88 | 0.80, 0.97 | 0.013 |
| Age, years | 1.0 | 0.96, 1.1 | 0.341 |
| Sex (female) | 1.1 | 0.42, 2.9 | 0.905 |
| Body mass index | 1.0 | 0.91, 1.2 | 0.671 |
| Education level (per class) | 1.1 | 0.59, 1.8 | 0.836 |
| Hypertension | 0.86 | 0.35, 2.2 | 0.738 |
| Arrhythmia | 1.4 | 0.37, 4.6 | 0.557 |
| Coronary heart disease | 1.0 | 0.14, 4.3 | 0.997 |
| History of stroke | 1.3 | 0.26, 4.4 | 0.749 |

Hosmer-Lemeshow goodness of fit test: χ2 = 11, df = 8, *P* Value = 0.217

**Supplemental Table 6. Effect Sizes in Primary Mediation Analysis with Diabetes \* Alpha Power Interaction**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Total Effect  (95% CI) | Direct Effect  (95% CI) | Indirect Effect  (95% CI) | Mediated  Proportion (%) |
| Diabetes \* Alpha Power |  |  |  |  |
| *adjusted* | 10.4 (3.0, 18) | 8.3 (0.5, 16) | 2.1 (0.3, 5.0) | 20 (2.7, 80) |

Interaction test:

ACME (1) – ACME (0) = 0.006, 95% CI: -0.04 to 0.04; *P*-for-interaction = 0.728

**Supplemental Table 7. Exploratory Analyses for Baseline and Intraoperative Power in Delta(1-4Hz), Theta(4-8Hz), and Beta(12-25Hz) Band between Groups**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Diabetes  (n = 132) | Non-diabetes  (n = 134) | *P* value |
| Baseline |  |  |  |
| Delta power (dB) | 2.5 (1.1, 3.8) | 3.0 (1.7, 4.8) | 0.053 |
| Theta power (dB) | -1.1 (-2.7, 0.7) | -0.9 (-2.4, 0.8) | 0.794 |
| Beta power (dB) | -1.7 (-3.1, 0.1) | -1.4 (-3.1, 0.1) | 0.434 |
| Intraoperative |  |  |  |
| Delta power (dB) | 7.0 (5.8, 8.5) | 7.4 (5.6, 9.4) | 0.257 |
| Theta power (dB) | 2.0 (0, 3.3) | 2.5 (0.7, 4.0) | 0.033 |
| Beta power (dB) | -0.4 (-2.9, 2.3) | 1.7 (-0.6, 4.4) | ＜0.001 |

**Supplemental Table 8. Exploratory analyses for association of Intraoperative Delta(1-4Hz), Theta(4-8Hz), and Beta(12-25Hz) Power with Postoperative delirium**

|  |  |  |
| --- | --- | --- |
|  | Adjusted odds ratio (95% CI) a | *P* Value |
| Intraoperative delta power | 1.0 (0.85, 1.2) | 0.782 |
| Intraoperative theta power | 0.91 (0.75, 1.1) | 0.279 |
| Intraoperative beta power | 0.93 (0.83, 1.0) | 0.190 |

a Models adjusted for age, sex, body mass index, education level, hypertension, arrhythmia, coronary heart disease, and history of stroke.

**Supplemental Table 9. Adjusted Mediation Effect Sizes in Exploratory Analyses Using Delta (1-4 Hz), Theta (4-8 Hz), and Beta (12-25 Hz) Power as Mediator Separately**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Total Effect *a*  (95% CI) | Direct Effect *b*  (95% CI) | Indirect Effect *c*  (95% CI) | Mediated Proportion *d*  (95% CI) |
| Delta power | 10.7 (3.4, 18) | 10.7 (3.4, 19) | -0.08 (-1.0, 1.0) | -0.77 (-11, 8.0) |
| Theta power | 10.6 (3.4, 18) | 9.9 (2.7, 18) | 0.64 (-0.49, 2.0) | 6.1 (-4.9, 29) |
| Beta power | 10.6 (3.6, 18) | 9.2 (2.1, 17) | 1.4 (-0.60, 4.0) | 13.4 (-7.1, 50) |

Models adjusted for age, sex, body mass index, education level, hypertension, arrhythmia, coronary heart disease, and history of stroke.

*a* Defined as the entire effect of diabetes on POD and equals the sum of the direct effect and the indirect effect.

*b*Defined as the difference of the potential delirium incidence when changing the individual’s exposure value from diabetes to non-diabetes, while holding the alpha power constant at the value that would be observed under a certain exposure status.

*c* Defined as the difference of the potential delirium incidence when an individual’s exposure status remained fixed, while the alpha power was modified as if individual’s exposure status had changed.

*d* Defined as the indirect effect divided by the total effect multiplied by 100%.

**Supplemental Table 10. Adverse Clinical Outcomes During Hospitalization**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Diabetes  (n = 132) | Non-diabetes  (n = 134) | *P* Value*a* |
| Acute heart failure | 2 (1.5) | 0 (0) | 0.471 |
| Acute myocardial infarction | 1 (0.8) | 0 (0) | 0.994 |
| Pneumonia | 1 (0.8) | 1 (0.7) | 0.485 |
| Stroke | 0 (0) | 0 (0) | - |
| Renal failure | 0 (0) | 0 (0) | - |

*a* The *P* value was calculated using Yates’ continuity corrected chi-square test.