**eTable 1:** Characteristics of patients with mild, moderate and severe ARDS with spontaneous breathing activity (SB group) and without spontaneous breathing activity (C group)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ARDS, Mild | | ARDS, Moderate | | ARDS, Severe | | ARDS, All | | P value |
| SB Group n=344 | C Group  n=171 | SB Group  n=488 | C Group  n=356 | SB Group  n=184 | C Group  n=213 | SB Group n=1016 | C Group  n=740 |
| Age (yrs), mean (SD) | 62.5±16.9 | 58.8±17.8\* | 62.2±16.0 | 61.9±16.1 | 57.4±17.7 | 57.1±17.5 | 61.4±16.8 | 59.8±17.1 | 0.048 |
| Males, N (%) | 207 (60.2) | 112 (65.5) | 310 (63.5) | 223 (62.6) | 125 (67.9) | 128 (60.1) | 642 (63.2) | 463 (62.6) | 0.829 |
| Height (cm), mean (SD) | 167.7±10.3 | 169.0±9.5 | 168.0±10.1 | 168.6±9.7\* | 168.0±9.6 | 168.3±10.2 | 167.9±10.0 | 168.6±9.8 | 0.154 |
| Weight (kg), mean (SD | 74.6±18.2 | 79.0±22.1\* | 77.9±31.9 | 78.2±18.4 | 76.6±21.5 | 81.6±24.7\* | 76.6±26.2 | 79.4±21.3 | 0.015 |
| Admission type, n (%) |  |  |  |  |  |  |  |  | 0.115 |
| Medical | 243 (70.6) | 110 (64.3) | 352 (72.1) | 275 (77.2) | 150 (81.5) | 173 (81.2) | 745 (73.3) | 558 (75.4) |  |
| Surgical (post-op elective) | 23 (6.7) | 13 (7.6) | 35 (7.2) | 14 (3.9) | 9 (4.9) | 10 (4.7) | 67 (6.6) | 37 (5.0) |  |
| Surgical | 65 (18.9) | 32 (18.7) | 81 (16.6) | 53 (14.9) | 21 (11.4) | 21 (9.9) | 167 (16.4) | 106 (14.3) |  |
| Trauma | 13 (3.8) | 16 (9.4) \* | 20 (4.1) | 14 (3.9) | 4 (2.2) | 9 (4.2) | 37 (3.6) | 39 (5.3) |  |
| Chronic disease, n (%) |  |  |  |  |  |  |  |  |  |
| Diabetes | 75 (21.8) | 41 (24.0) | 116 (23.8) | 84 (23.6) | 32 (17.4) | 54 (25.4) | 223 (21.9) | 179 (24.2) | 0.296 |
| COPD | 69 (20.1) | 30 (17.5) | 107 (21.9) | 81 (22.8) | 33 (17.9) | 48 (22.5) | 209 (20.6) | 159 (21.5) | 0.685 |
| Chronic renal failure | 36 (10.5) | 19 (11.1) | 51 (10.5) | 33 (9.3) | 11 (6.0) | 15 (7.0) | 98 (9.6) | 67 (9.1) | 0.736 |
| Neoplasm or immunosuppressed | 75 (21.8) | 30 (17.5) | 99 (20.3) | 65 (18.3) | 44 (23.9) | 43 (20.2) | 218 (21.5) | 138 (18.6) | 0.166 |
| Chronic heart failure | 37 (10.8) | 16 (9.4) | 44 (9.0) | 39 (11.0) | 14 (7.6) | 14 (6.6) | 95 (9.4) | 69 (9.3) | 1.000 |
| Chronic liver failure | 15 (4.4) | 5 (2.9) | 21 (4.3) | 16 (4.5) | 9 (4.9) | 11 (5.2) | 45 (4.4) | 32 (4.3) | 1.000 |
| Home ventilation | 9 (2.6) | 0 (0.0) | 8 (1.6) | 6 (1.7) | 3 (1.6) | 2 (0.9) | 20 (2.0) | 8 (1.1) | 0.203 |
| Risk factor for ARDS, No. (%) |  |  |  |  |  |  |  |  |  |
| Pneumonia | 182 (52.9) | 77 (45.0) | 288 (59.0) | 225 (63.2) | 122 (66.3) | 126 (59.2) | 592 (58.3) | 428 (57.8) | 0.896 |
| Non-Pulmonary Sepsis | 69 (20.1) | 34 (19.9) | 93 (19.1) | 46 (12.9)\* | 33 (17.9) | 31 (14.6) | 195 (19.2) | 111 (15.0) | 0.026 |
| Aspiration | 51 (14.8) | 32 (18.7) | 78 (16.0) | 66 (18.5) | 33 (17.9) | 40 (18.8) | 162 (15.9) | 138 (18.6) | 0.155 |
| Trauma | 20 (5.8) | 16 (9.4) | 26 (5.3) | 20 (5.6) | 9 (4.9) | 8 (3.8) | 55 (5.4) | 44 (5.9) | 0.709 |
| Inhalation | 10 (2.9) | 6 (3.5) | 11 (2.3) | 10 (2.8) | 5 (2.7) | 7 (3.3) | 26 (2.6) | 23 (3.1) | 0.587 |
| Pancreatitis | 6 (1.7) | 6 (3.5) | 11 (2.3) | 7 (2.0) | 7 (3.8) | 5 (2.3) | 24 (2.4) | 18 (2.4) | 1.000 |
| Burn | 1 (0.3) | 1 (0.6) | 3 (0.6) | 0 (0.0) | 1 (0.5) | 0 (0.0) | 5 (0.5) | 1 (0.1) | 0.411 |
| Pulmonary Vasculitis | 3 (0.9) | 3 (1.8) | 1 (0.2) | 7 (2.0)\* | 4 (2.2) | 4 (1.9) | 8 (0.8) | 14 (1.9) | 0.066 |
| Non-cardiogenic shock | 26 (7.6) | 14 (8.2) | 43 (8.8) | 27 (7.6) | 12 (6.5) | 19 (8.9) | 81 (8.0) | 60 (8.1) | 0.989 |
| Overdose | 8 (2.3) | 3 (1.8) | 10 (2.0) | 7 (2.0) | 3 (1.6) | 7 (3.3) | 41 (4.0) | 38 (5.1) | 0.326 |
| TRALI | 13 (3.8) | 10 (5.8) | 27 (5.5) | 13 (3.7) | 1 (0.5) | 15 (7.0) | 592 (58.3) | 428 (57.8) | 0.896 |
| SOFA severity of illness, mean (SD) | 8.4±3.5 | 9.6±3.6\* | 9.9±3.7 | 10.4±3.9 | 11.1±3.8 | 11.8±4.1 | 9.6±3.8 | 10.6±4.0 | <0.001 |
| Treatment limitations, n (%) | 77 (22.4) | 42 (24.6) | 115 (23.6) | 49 (26.6%) | 49 (23.0%) | 95 (44.6) | 241 (23.7) | 187 (25.3) | 0.490 |
| ICU Mortality | 94 (27.3) | 55 (32.2) | 156 (32.0) | 67 (36.4)\* | 95 (44.6) | 100 (47.6) | 317 (31.2) | 288 (38.9) | 0.001 |
| Hospital Mortality | 114 (33.4) | 62 (36.3) | 187 (38.4) | 157 (44.2) | 76 (41.3) | 100 (47.6) | 377 (37.3) | 319 (43.3) | 0.012 |
| ICU LOS, d | 11.0 [7.0;19.0] | 11.0 [6.0;21.0] | 10.0 [6.0;18.0] | 12.0 [7.0;22.0]\* | 12.0 [6.0;20.0] | 12.0 [7.0;21.0] | 11.0 [6.0;19.0] | 12.0 [7.0;22.0] | 0.012 |
| Hospital LOS, d | 20.0 [11.0;35.0] | 18.0 [9.0;38.0] | 16.0 [9.0;33.0] | 19.0 [9.2;34.0] | 18.0 [8.0;32.0] | 18.5 [9.0;33.0] | 18.0 [9.0;33.0] | 19.0 [9.0;35.0] | 0.837 |
| Ventilation free-days to day 28 mean (IQR), d | 16.0 [0.0;23.0] | 12.0 [0.0;22.0] | 15.0 [0.0;22.0] | 6.0 [0.0;19.0]\* | 9.0 [0.0;19.2] | 0.0 [0.0;17.5]\* | 15.0 [0.0;22.0] | 5.5 [0.0;19.0] | <0.001 |
| No. of ICU beds, median [IQR] | 19.0 [12.0;26.0] | 16.0 [10.0;24.0] | 18.0 [11.5;25.0] | 16.0 [10.0;22.0] | 16.0 [10.0;25.5] | 16.0 [10.0;24.0] | 18.0 [12.0; 26.0] | 16.0 [10.0; 23.0] | 0.003 |
| No. of patients/staff physician, median [IQR] | 6.0 [3.0;10.0] | 4.7 [2.4;8.5]\* | 5.0 [2.7;12.0] | 4.0 [2.5;8.0]\* | 5.0 [3.0;10.0] | 3.8 [2.4;8.0]\* | 5.4 [2.8; 11.0] | 4.0 [2.5; 8.1] | <0.001 |
| No. of patients/nurse, median [IQR] | 1.5 [1.0;2.0] | 1.4 [1.0;2.0]\* | 1.4 [1.0;2.0] | 1.7 [1.1;2.2]\* | 1.3 [1.0;2.0] | 1.4 [1.0;2.2]\* | 1.4 [1.0; 2.0] | 1.5 [1.0; 2.2] | 0.019 |
| Clinician recognition of ARDS at any time, n (%) | 173 (50.3) | 98 (57.3) | 303 (62.1) | 258 (72.5)\* | 146 (79.3) | 162 (76.1) | 622 (61.2) | 518 (70.0) | <0.001 |
| **Ventilation variables,**  **mean day 1 and 2, +/- SD** |  |  |  |  |  |  |  |  |  |
| FiO2, median [IQR] | 0.4 [0.4;0.5] | 0.4 [0.4;0.5]\* | 0.5 [0.4;0.6] | 0.6 [0.5;0.7]\* | 0.8 [0.7;0.9] | 0.8 [0.7;1.0]\* | 0.5 [0.4;0.7] | 0.6 [0.5;0.8] | <0.001 |
| Respiratory rate (actual) | 20.1±5.4 | 18.4±4.7\* | 21.0±5.3 | 20.5±5.2 | 22.7±5.5 | 21.8±5.5 | 21.0±5.5 | 20.4±5.3 | 0.024 |
| VT, mL/kg PBW | 7.9±1.7 | 7.7±1.5 | 7.9±1.7 | 7.5±1.5\* | 7.7±1.7 | 7.5±1.5 | 7.9±1.7 | 7.5±1.5 | <0.001 |
| PEEP, cm H2O | 7.0±2.3 | 7.5±2.6 | 8.1±2.7 | 8.8±3.0\* | 9.6±2.9 | 10.0±3.3 | 8.0±2.7 | 8.9±3.1 | <0.001 |
| Peak pressure, cm H2O | 22.8±7.0 | 27.1±8.5 | 24.6±6.4 | 29.8±6.8\* | 27.3±6.8 | 31.3±7.3\* | 24.5±6.9 | 29.6±7.5 | <0.001 |
| Plateau pressure, cm H2O | 19.9±5.4 | 21.8±5.1 | 22.4±4.9 | 23.4±5.3 | 25.7±6.2 | 25.7±6.1 | 22.2±5.7 | 23.8±5.7 | <0.001 |
| Compliance (mL/cm H2O) | 39.8±15.7 | 37.5±14.1 | 35.0±14.0 | 34.6±14.8 | 31.5±13.5 | 32.6±14.6 | 36.0± 14.8 | 34.5±14.3 | 0.161 |
| Minute ventilation, l/min | 9.47±3.30 | 9.54±3.15 | 10.76±3.85 | 10.97±4.29 | 12.29±3.81 | 12.24±5.12 | 10.59±3.79 | 11.01±4.43 | 0.038 |
| SpO2, %, median [IQR] | 97.5 [96.5;99.0] | 97.5 [96.2;98.5] | 96.0 [94.0;97.5] | 96.5 [94.5;97.8] | 94.0 [90.5;96.0] | 94.0 [91.0;96.0] | 96.5 [94.5;98.0] | 96.0 [94.0;98.0] | 0.307 |
| PaCO2 mmHg (+/- SD) | 37.2±10.7 | 39.4±11.8 | 39.5±12.3 | 42.7±14.6\* | 42.7±12.5 | 44.2±17.5 | 39.3±11.9 | 42.4±15.0 | <0.001 |
| pH, (+/- SD) | 7.38±0.08 | 7.35±0.09\* | 7.36±0.09 | 7.33±0.10\* | 7.33±0.10 | 7.29±0.11\* | 0.5 [0.4;0.7] | 0.6 [0.5;0.8] | <0.001 |

\**P*<0.05 C group versus SB group

**eTable 2.** Characteristics, ventilation variables and outcomes in patients with ARDS without spontaneous breathing activity (C group), partially spontaneous breathing (SB-P group) and fully spontaneous breathing (SB-F group)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | SB-F group  n= 180 | SB-P group  n= 836 | C group  n= 740 | p-value  (global) | p-value  (SB-F vs C) | p-value  (SB-F vs SB-P) | p-value  (SB-P vs C) |
| Age | 65.3±16.2 | 60.6±16.8 | 59.8±17.1 | <0.001 | <0.001 | 0.001 | 0.360 |
| Male, n (%) | 114 (63.3%) | 528 (63.2%) | 463 (62.6%) | 0.964 | 0.917 | 1.000 | 0.849 |
| Height (cm) | 168.6±9.8 | 167.7±10.1 | 168.6±9.8 | 0.220 | 1.000 | 0.312 | 0.099 |
| Weight (kg) | 75.2±18.1 | 76.8±27.7 | 79.4±21.3 | 0.047 | 0.994 | 0.346 | 0.045 |
| ARDS severity, n (%) |  |  |  | <0.001 | <0.001 | <0.001 | <0.001 |
| Mild | 83 (46.1%) | 261 (31.2%) | 171 (23.1%) |  |  |  |  |
| Moderate | 83 (46.1%) | 405 (48.4%) | 356 (48.1%) |  |  |  |  |
| Severe | 14 (7.8%) | 170 (20.3%) | 213 (28.8%) |  |  |  |  |
| PaO2:FiO2 ratio, mmHg | 198.6±59.5 | 182.3±65.7 | 164.9±63.0 | <0.001 | <0.001 | 0.255 | <0.001 |
| Type of admission: |  |  |  | 0.046 | 0.029 | 0.078 | 0.189 |
| Medical | 118 (65.6%) | 627 (75.0%) | 558 (75.4%) |  |  |  |  |
| Postoperative(elective) | 15 (8.3%) | 52 (6.2%) | 37 (5.0%) |  |  |  |  |
| Surgical | 38 (21.1%) | 129 (15.4%) | 106 (14.3%) |  |  |  |  |
| Trauma | 9 (5.0%) | 28 (3.3%) | 39 (5.3%) |  |  |  |  |
| Chronic disease, No. (%) |  |  |  |  |  |  |  |
| Diabetes | 39 (21.7%) | 184 (22.0%) | 179 (24.2%) | 0.541 | 0.538 | 0.999 | 0.334 |
| COPD | 36 (20.0%) | 173 (20.7%) | 159 (21.5%) | 0.878 | 0.737 | 0.915 | 0.746 |
| Chronic renal failure | 13 (7.2%) | 85 (10.2%) | 67 (9.1%) | 0.431 | 0.526 | 0.282 | 0.508 |
| Haematology/Oncology/Immunology | 34 (18.9%) | 184 (22.0%) | 138 (18.6%) | 0.225 | 1.000 | 0.409 | 0.112 |
| Heart Failure | 17 (9.4%) | 78 (9.3%) | 69 (9.3%) | 0.999 | 1.000 | 1.000 | 1.000 |
| Chronic liver failure | 7 (3.9%) | 38 (4.5%) | 32 (4.3%) | 0.922 | 0.957 | 0.850 | 0.928 |
| Home ventilation | 4 (2.2%) | 16 (1.9%) | 8 (1.1%) | 0.271 | 0.265 | 0.768 | 0.254 |
| Risk factors for ARDS, No. (%) |  |  |  |  |  |  |  |
| Pneumonia | 96 (53.3%) | 496 (59.3%) | 428 (57.8%) | 0.330 | 0.312 | 0.163 | 0.583 |
| Non-pulmonary sepsis | 26 (14.4%) | 169 (20.2%) | 111 (15.0%) | 0.013 | 0.943 | 0.093 | 0.008 |
| Aspiration | 30 (16.7%) | 132 (15.8%) | 138 (18.6%) | 0.318 | 0.610 | 0.858 | 0.151 |
| Trauma | 11 (6.1%) | 44 (5.3%) | 44 (5.9%) | 0.807 | 1.000 | 0.784 | 0.632 |
| Inhalation | 4 (2.2%) | 22 (2.6%) | 23 (3.1%) | 0.753 | 0.700 | 1.000 | 0.678 |
| Pancreatitis | 5 (2.8%) | 19 (2.3%) | 18 (2.4%) | 0.876 | 0.790 | 0.598 | 0.966 |
| Burns | 2 (1.1%) | 3 (0.4%) | 1 (0.1%) | 0.121 | 0.100 | 0.216 | 0.627 |
| Pulmonary vasculitis | 1 (0.6%) | 7 (0.8%) | 14 (1.9%) | 0.137 | 0.327 | 1.000 | 0.109 |
| Non-cardiogenic shock | 17 (9.4%) | 64 (7.7%) | 60 (8.1%) | 0.722 | 0.667 | 0.514 | 0.811 |
| Overdose | 4 (2.2%) | 17 (2.0%) | 17 (2.3%) | 0.889 | 1.000 | 0.777 | 0.852 |
| TRALI | 3 (1.7%) | 38 (4.5%) | 38 (5.1%) | 0.131 | 0.069 | 0.116 | 0.669 |
| SOFA | 8.5±3.6 | 9.8±3.8 | 10.6±4.0 | <0.001 | <0.001 | <0.001 | <0.001 |
| Treatment limitations, n (%) | 43 (23.9%) | 198 (23.7%) | 187 (25.3%) | 0.755 | 0.773 | 1.000 | 0.501 |
| Clinician recognition of ARDS, n (%) |  |  |  |  |  |  |  |
| Day 1 | 42 (23.3%) | 279 (33.4%) | 263 (35.5%) | 0.008 | 0.002 | 0.011 | 0.395 |
| At any time | 92 (51.1%) | 530 (63.4%) | 518 (70.0%) | <0.001 | <0.001 | 0.003 | 0.007 |
| ICU Mortality n (%) | 49 (27.2%) | 268 (32.1%) | 288 (38.9%) | 0.002 | 0.005 | 0.237 | 0.005 |
| Hospital Mortality n (%) | 66 (36.9%) | 311 (37.3%) | 319 (43.3%) | 0.037 | 0.005 | 0.975 | 0.018 |
| ICU LOS, d [IQR] | 11.0 [6.8;19.0] | 11.0 [6.0;19.0] | 12.0 [7.0;22.0] | 0.032 | 0.382 | 0.415 | 0.009 |
| Hospital LOS, d [IQR] | 20.0 [11.0;38.2] | 18.0 [9.0;33.0] | 19.0 [9.0;35.0] | 0.177 | 0.174 | 0.062 | 0.470 |
| Invasive ventilation free-days to day 28 mean (IQR), d | 15.0 [0.0;23.0] | 15.0 [0.0;22.0] | 5.5 [0.0;19.0] | <0.001 | <0.001 | 0.410 | <0.001 |
| **Ventilation variables,**  **mean day 1 and 2, +/- SD** |  |  |  |  |  |  |  |
| FiO2, median [IQR] | 0.4 [0.4;0.5] | 0.6 [0.4;0.7] | 0.6 [0.5;0.8] | <0.001 | <0.001 | <0.001 | <0.001 |
| Respiratory rate (actual) | 20.6±5.9 | 21.1±5.4 | 20.4±5.3 | 0.040 | 0.761 | 0.269 | 0.012 |
| VT, mL/kg PBW | 8.0±1.7 | 7.8±1.7 | 7.5±1.7 | <0.001 | 0.001 | 0.131 | 0.001 |
| PEEP, cm H2O | 7.7±2.5 | 8.0±2.8 | 8.9±3.1 | <0.001 | <0.001 | 0.098 | <0.001 |
| Peak pressure, cm H2O | 18.9±5.0 | 25.6±6.6 | 29.6±7.5 | <0.001 | <0.001 | <0.001 | <0.001 |
| Plateau pressure, cm H2O | NA | 22.2±5.7 | 23.8±5.7 | <0.001 |  |  | <0.001 |
| Standardized minute ventilate, l/min | 10.23±3.72 | 10.66±3.80 | 11.01±4.43 | 0.047 | 0.017 | 0.166 | 0.101 |
| SpO2, %, median [IQR] | 96.5 [94.5;98.0] | 96.0 [94.0;98.0] | 96.0 [94.0;98.0] | 0.372 | 0.162 | 0.342 | 0.496 |
| PaCO2 mmHg | 36.6±12.7 | 39.9±11.7 | 42.4±15.0 | <0.001 | <0.001 | 0.002 | <0.001 |
| pH | 7.39±0.07 | 7.36±0.10 | 7.32±0.10 | <0.001 | <0.001 | <0.001 | <0.001 |

**eTable 3.** Characteristics of patients with ARDS who survived compared to non-survivors

|  |  |  |  |
| --- | --- | --- | --- |
|  | Survivors  N=1052 | Non-survivors N=696 | p-value |
| Age | 58.7±16.8 | 63.7±16.6 | <0.001 |
| Male, n (%) | 658 (62.5%) | 443 (63.6%) | 0.677 |
| Height (cm) | 161.0±28.5 | 161.6±25.4 | 0.654 |
| Weight (kg) | 79.6±27.0 | 75.1±19.3 | <0.001 |
| Type admission: |  |  | <0.001 |
| Medical | 746 (70.9%) | 552 (79.3%) |  |
| Postoperative (elective) | 75 (7.1%) | 27 (3.9%) |  |
| Surgical | 177 (16.8%) | 95 (13.6%) |  |
| Trauma | 54 (5.1%) | 22 (3.2%) |  |
| Chronic disease, n (%) |  |  |  |
| Diabetes | 225 (21.4%) | 174 (25.0%) | 0.089 |
| COPD | 217 (20.6%) | 147 (21.1%) | 0.850 |
| Chronic renal failure | 87 (8.3%) | 77 (11.1%) | 0.061 |
| Haematology/Oncology/Immunology | 166 (15.8%) | 186 (26.7%) | <0.001 |
| Heart Failure | 85 (8.1%) | 77 (11.1%) | 0.043 |
| Chronic liver failure | 24 (2.3%) | 53 (7.6%) | <0.001 |
| Home ventilation | 19 (1.8%) | 9 (1.3%) | 0.521 |
| Risk factors for ARDS, n (%) |  |  |  |
| Pneumonia | 601 (57.1%) | 414 (59.5%) | 0.354 |
| Non-pulmonary sepsis | 162 (15.4%) | 142 (20.4%) | 0.008 |
| Aspiration | 177 (16.8%) | 120 (17.2%) | 0.871 |
| Trauma | 75 (7.1%) | 24 (3.4%) | 0.002 |
| Inhalation | 30 (2.9%) | 19 (2.7%) | 0.998 |
| Pancreatitis | 22 (2.1%) | 20 (2.9%) | 0.376 |
| Burns | 4 (0.4%) | 2 (0.3%) | 1.000 |
| Pulmonary vasculitis | 7 (0.7%) | 14 (2.0%) | 0.021 |
| Non-cardiogenic shock | 73 (6.9%) | 68 (9.8%) | 0.042 |
| Drowning | 0 (0.0%) | 1 (0.1%) | 0.398 |
| Overdose | 30 (2.9%) | 8 (1.1%) | 0.026 |
| TRALI | 38 (3.6%) | 41 (5.9%) | 0.033 |
| ARDS severity, n (%) |  |  | 0.005 |
| Mild | 336 (31.9%) | 176 (25.3%) |  |
| Moderate | 498 (47.3%) | 344 (49.4%) |  |
| Severe | 218 (20.7%) | 176 (25.3%) |  |
| PaO2:FiO2 ratio, mmHg | 182.2±63.8 | 167.8±65.4 | <0.001 |
| SOFA score | 9.4±3.7 | 11.0±4.0 | <0.001 |
| non-pulmonary SOFA score | 6.2±3.6 | 7.8±4.0 | <0.001 |
| Treatment limitations, n (%) | 59 (5.6%) | 369 (53.0%) | <0.001 |
| Clinician recognition of ARDS, n (%) |  |  |  |
| Day 1 | 322 (30.6%) | 260 (37.4%) | 0.004 |
| At any time | 639 (60.7%) | 496 (71.3%) | <0.001 |
| **Ventilation variables,**  **mean day 1 and 2, +/- SD** |  |  |  |
| SB-F group, n (%) | 113 (10.7%) | 66 (9.5%) | 0.442 |
| SB-P group, n (%) | 157 (33.8%) | 110 (42.8%) | 0.020 |
| C-group, n (%) | 417 (39.6%) | 319 (45.8%) | 0.012 |
| FiO2, median [IQR] | 0.6 [0.4;0.7] | 0.6 [0.4;0.8] | <0.001 |
| Respiratory rate (actual) | 20.2±5.2 | 21.6±5.7 | <0.001 |
| VT, mL/kg PBW | 7.8±1.6 | 7.6±1.7 | 0.068 |
| PEEP, cm H2O | 8.4±3.0 | 8.3±2.9 | 0.578 |
| Peak pressure, cm H2O | 26.0±7.5 | 27.6±7.7 | <0.001 |
| Plateau pressure, cm H2O | 22.4±5.6 | 24.0±5.8 | 0.001 |
| Standardized minute ventilate, l/min | 10.72±4.03 | 10.85±4.15 | 0.521 |
| SpO2, %, median [IQR] | 96.5 [94.5;98.0] | 96.0 [93.5;97.5] | 0.004 |
| PaCO2, mmHg | 40.9±13.6 | 40.2±13.1 | 0.281 |
| pH | 7.36±0.08 | 7.32±0.11 | <0.001 |

**eTable 4.** Effect of SB on ICU mortality in a multivariable logistic regression model

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | OR | 95%CI | p-value |
| Age | 1.02 | 1.01-1.02 | <0.001 |
| Weight (for 10kg) | 0.93 | 0.88-0.98 | 0.007 |
| Admission for surgery | 0.62 | 0.47-0.83 | 0.001 |
| Immunosuppression | 1.85 | 1.42-2.43 | <0.001 |
| Chronic liver failure | 2.58 | 1.50-4.50 | <0.001 |
| Non-pulmonary sepsis | 1.37 | 1.02-1.85 | 0.035 |
| Non-pulmonary SOFA score | 1.09 | 1.06-1.12 | <0.001 |
| PaO2/FiO2 ratio (mean day1/day2), for 10mmHg | 0.97 | 0.95-0.99 | 0.001 |
| pH (mean day1/day2), for 0.01pt | 0.97 | 0.96-0.99 | <0.001 |
| Respiratory rate (actual) (mean day1/day2) | 1.04 | 1.02-1.06 | <0.001 |
| PEEP (mean day1/day2) | 0.94 | 0.90-0.98 | 0.007 |
| Peak pressure (mean day1/day2) | 1.02 | 1.00-1.04 | 0.018 |
| **No spontaneous breathing** | **1.17** | **0.92-1.49** | **0.208** |

**eTable 5.** Effect of SB on hospital mortality in a multivariable logistic regression model

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | OR | 95%CI | p-value |
| Age | 1.02 | 1.02-1.03 | <0.001 |
| Weight (for 10kg) | 0.91 | 0.87-0.96 | 0.001 |
| Admission for surgery | 0.64 | 0.49-0.85 | 0.002 |
| Immunosuppression | 1.92 | 1.48-2.50 | <0.001 |
| Chronic liver failure | 2.80 | 1.52-4.57 | <0.001 |
| Non-pulmonary sepsis | 1.46 | 1.03-1.87 | 0.009 |
| Non-pulmonary SOFA score | 1.07 | 1.06-1.12 | <0.001 |
| PaO2/FiO2 ratio (mean day1/day2), for 10mmHg | 0.97 | 0.95-0.99 | 0.004 |
| pH (mean day1/day2), for 0.01pt | 0.98 | 0.96-0.98 | <0.001 |
| Respiratory rate (actual) (mean day1/day2) | 1.04 | 1.02-1.07 | <0.001 |
| PEEP (mean day1/day2) | 0.94 | 0.91-0.99 | 0.003 |
| Peak pressure (mean day1/day2) | 1.02 | 1.00-1.04 | 0.075 |
| **No spontaneous breathing** | **1.13** | **0.92-1.50** | **0.298** |

**eTable 6.** Effect of SB on hospital mortality in a multivariable logistic regression model in patients with PaO2/FiO2 ratio < 150

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | OR | 95%CI | p-value |
| Age | 1.02 | 1.02-1.04 | <0.001 |
| Weight (for 10kg) | 0.86 | 0.79-0.93 | 0.001 |
| Immunosuppression | 2.17 | 1.42-3.35 | <0.001 |
| Chronic liver failure | 4.33 | 1.81-11.62 | 0.002 |
| Extrapulmonary sepsis | 2.19 | 1.31-3.71 | 0.003 |
| Non-pulmonary SOFA at admission | 1.04 | 0.99-1.10 | 0.086 |
| pH (D1/D2 mean), for 0.01pt | 0.98 | 0.96-0.99 | 0.007 |
| PaO2/FiO2 ratio (D1/D2 mean), for 10mmHg | 0.99 | 0.98-1.00 | 0.001 |
| Peak pressure (D1/D2 mean) | 1.02 | 0.99-1.05 | 0.170 |
| **No spontaneous breathing** | **1.05** | **0.72-1.52** | **0.806** |

**eTable 7.** Effect of SB on hospital mortality in a multivariable logistic regression model in patients with PaO2/FiO2 ratio ≥ 150

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | OR | 95%CI | p-value |
| Age | 1.02 | 1.02-1.03 | <0.001 |
| Admission for surgery | 0.67 | 0.49-0.93 | 0.017 |
| Immunosuppression | 1.85 | 1.33-2.57 | <0.001 |
| Chronic liver failure | 2.19 | 1.10-4.48 | 0.027 |
| Non-pulmonary SOFA at admission | 1.12 | 1.08-1.16 | 0.086 |
| pH (D1/D2 mean),for 0.01pt | 0.97 | 0.96-0.99 | 0.002 |
| Total RR (D1/D2 mean) | 1.05 | 1.02-1.08 | <0.001 |
| PEEP (D1/D2 mean) | 0.94 | 0.89-0.98 | 0.016 |
| Peak pressure (D1/D2 mean) | 1.02 | 0.99-1.04 | 0.116 |
| **No spontaneous breathing** | **1.16** | **0.86-1.56** | **0.346** |

**eTable 8.** Effect of SB on hospital mortality in a multivariable logistic regression model, adding interaction term PaO2/FiO2 ratio\*no spontaneous breathing

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Beta | SE | OR | 95%CI | p-value |
| Age | 0.022 | 0.003 | 1.02 | 1.02-1.03 | <0.001 |
| Weight (for 10kg) | -0.090 | 0.027 | 0.91 | 0.87-0.96 | 0.001 |
| Admission for surgery | -0.443 | 0.142 | 0.64 | 0.49-0.85 | 0.002 |
| Immunosuppression | 0.650 | 0.134 | 1.92 | 1.48-2.50 | <0.001 |
| Chronic liver failure | 1.028 | 0.287 | 2.80 | 1.52-4.57 | <0.001 |
| Extrapulmonary sepsis | 0.376 | 0.148 | 1.46 | 1.03-1.87 | 0.011 |
| Non-pulmonary SOFA at admission | 0.079 | 0.016 | 1.07 | 1.06-1.12 | <0.001 |
| pH (D1/D2 mean), for 0.01pt | -0.024 | 0.006 | 0.98 | 0.96-0.98 | <0.001 |
| PF (D1/D2 mean), for 10mmHg | -0.026 | 0.012 | -- | -- | 0.028 |
| Total RR (D1/D2 mean) | 0.039 | 0.011 | 1.04 | 1.02-1.07 | <0.001 |
| PEEP (D1/D2 mean) | -0.063 | 0.021 | 0.94 | 0.91-0.99 | 0.003 |
| Peak pressure (D1/D2 mean) | 0.015 | 0.008 | 1.02 | 1.00-1.04 | 0.074 |
| CONTROLLED ventilation | 0.176 | 0.326 | -- | -- | 0.590 |
| **Interaction term PaO2/FiO2 ratio\*no spontaneous breathing** | **-0.003** | **0.018** | **--** | **--** | **0.865** |

**eTable 9.** Clinical variables and outcomes of patients with ARDS with spontaneous breathing activity (SB group) and without spontaneous breathing activity (C group) in the Propensity Score matched sample

|  |  |  |  |
| --- | --- | --- | --- |
|  | SB group n=555 | C group n=555 | p-value |
| Age, yr, mean (SD) | 59.6 (17.1) | 60.4 (17.0) | 0.398 |
| Males, n (%) | 360 (64.9) | 347 (62.5) | 0.543 |
| Height, cm, mean (SD) | 168.7 (9.7) | 168.6 (9.6) | 0.647 |
| Weight kg, mean (SD) | 79.0 (23.4) | 78.6 (20.7) | 0.726 |
| Admission type, n (%) |  |  | 0.267 |
| Medical | 428 (77.1) | 408 (73.5) |  |
| Surgical (post-op elective) | 31 (5.6) | 33 (5.9) |  |
| Surgical | 77 (13.9) | 84 (15.1) |  |
| Trauma | 19 (3.4) | 30 (5.4) |  |
| Chronic Disease, n (%) |  |  |  |
| Diabetes | 127 (22.9%) | 137 (24.7%) | 0.532 |
| COPD | 119 (21.4%) | 121 (21.8%) | 0.943 |
| Chronic Renal Failure | 46 (8.3%) | 48 (8.6%) | 0.913 |
| Haematology/Oncology/Immunology | 105 (18.9%) | 110 (19.8%) | 0.765 |
| Chronic Heart Failure | 48 (8.6%) | 56 (10.1%) | 0.461 |
| Chronic Liver Fail | 21 (3.8) | 23 (4.1) | 0.877 |
| Home ventilation | 7 (1.3) | 7 (1.3) | 1.000 |
| Risk factors for ARDS, n (%) |  |  |  |
| Pneumonia | 324 (58.4) | 317 (57.1) | 0.719 |
| Non-pulmonary sepsis | 83 (15.0) | 94 (16.9) | 0.419 |
| Aspiration | 99 (17.8) | 104 (18.7) | 0.762 |
| Trauma | 35 (6.3) | 33 (5.9) | 0.897 |
| Inhalation | 17 (3.1) | 19 (3.4) | 0.868 |
| Pancreatitis | 14 (2.5) | 12 (2.2) | 0.844 |
| Burn | 2 (0.4) | 1 (0.2) | 1.000 |
| Pulmonary vasculitis | 5 (0.9) | 5 (0.9) | 1.000 |
| Non-cardiogenic shock | 40 (7.2) | 48 (8.6) | 0.422 |
| Drowning | 0 | 0 | NA |
| Overdose | 11 (2.0) | 9 (1.6) | 0.821 |
| TRALI | 25 (4.5) | 24 (4.3) | 1.000 |
| NO risk factor | 36 (6.5) | 44 (7.9) | 0.434 |
| ARDS severity n (%) |  |  | 0.294 |
| Mild | 137 (24.7) | 141 (25.4) |  |
| Moderate | 290 (52.3) | 271 (48.8) |  |
| Severe | 128 (23.1) | 143 (25.8) |  |
| PaO2:FiO2 ratio, mean per mmHg | 172.1±61.4 | 172.5±62.9 | 0.900 |
| Non pulmonary SOFA score | 6.9±3.8 | 7.0±3.8 | 0.772 |
| Ventilation variables,  mean day 1 and 2 (SD) |  |  |  |
| FiO2, median [IQR] | 0.6 [0.4;0.7] | 0.6 [0.5;0.8] | 0.070 |
| VT, mL/kg PBW | 7.6±1.5 | 7.6±1.6 | 0.953 |
| Respiratory rate (actual) | 20.3±5.1 | 20.5±5.4 | 0.706 |
| Standardized minute ventilation (L) | 10.91±4.15 | 10.84±4.27 | 0.778 |
| PEEP, cmH2O | 8.6±2.9 | 8.5±2.9 | 0.574 |
| Plateau pressure, cm H2O\* | 23.3±5.8 | 23.2±5.5 | 0.401 |
| Peak inspiratory pressure, cmH2O | 23.2±6.6 | 28.0±6.4 | 0.218 |
| Compliance, mL/cm H2O\*\* | 34.3±14.2 | 35.4±14.9 | 0.376 |
| PaCO2 mean (95% CI), mmHg | 41.6±12.5 | 41.9±14.6 | 0.684 |
| pH, mean ±SD | 7.34±0.10 | 7.34±0.09 | 0.868 |
| No. of ICU beds, median [IQR] | 17.0 [11.0;24.0] | 16.0 [10.5;24.0] | 0.253 |
| Duration of mechanical ventilation, median [IQR], d | 8.0 [4.0;14.5] | 10.0 [5.0;17.0] | 0.012 |
| Invasive ventilator free-days to day 28, median [IQR], d | 13.0 [0.0;22.0] | 8.0 [0.0;20.0] | 0.014 |
| ICU length of stay, median [IQR], d | 11.0 [6.0;19.5] | 12.0 [7.0;22.0] | 0.040 |
| Hospital length of stay, median [IQR], d | 17.0 [9.0;33.0] | 19.0 [10.0;34.5] | 0.109 |
| Treatment limitations, n (%) | 133 (24.0) | 136 (24.5) | 0.886 |
| ICU mortality, n (%) | 183 (33.0) | 204 (36.8) | 0.200 |
| Hospital mortality, n (%) | 206 (37.2) | 227 (41.2) | 0.196 |

\* Data for plateau pressure was available for 214 patients in the SB group and 306 in the C group

\*\* Data for compliance was available for 214 patients in the SB group and 298 in the C group

**eTable 10.** Missing data for variables used in the propensity score (C-group and SB-group)

|  |  |  |
| --- | --- | --- |
| Variable | N missing | % missing |
| Age | 0 | 0 |
| Height | 68 | 9.1 |
| Weight | 53 | 7.2 |
| Non-pulmonary SOFA score | 5 | 0.7 |
| PaCO2 | 14 | 1.9 |
| pH | 13 | 1.8 |
| VT | 73 | 9.9 |
| PaO2/FiO2 ratio | 0 | 0 |
| PEEP | 0 | 0 |
| Peak pressure | 28 | 3.8 |
| Respiratory rate (actual) | 1 | 0.1 |
| Standardised minute ventilation | 20 | 2.7 |
| Number of ICU beds | 109 | 14.7 |
| Surgical admission | 0 | 0 |
| Co-morbidity | 0 | 0 |
| Risk factor for ARDS | 0 | 0 |

**eTable 11**: Clinical variables and outcomes of patients with ARDS with spontaneous breathing activity (SB group) and without spontaneous breathing activity (C group) in the Propensity Score matched sample, when peak inspiratory pressure, pCO2, respiratory rate, minute ventilation and tidal volume was excluded from the model.

|  |  |  |  |
| --- | --- | --- | --- |
|  | SB group n=668 | C group n=668 | p-value |
| Age, yr, mean (SD) | 59.8 (16.8) | 60.2 (17.0) | 0.676 |
| Males, n (%) | 441 (66.0%) | 412 (61.7%) | 0.124 |
| Height, cm, mean (SD) | 168.5±10.2 | 168.4±9.7 | 0.818 |
| Weight kg, mean (SD) | 79.4±29.5 | 79.0±21.4 | 0.747 |
| Admission type, n (%) |  |  | 0.966 |
| Medical | 507 (75.9%) | 500 (74.9%) |  |
| Surgical (post-op elective) | 37 (5.5%) | 37 (5.5%) |  |
| Surgical | 94 (14.1%) | 97 (14.5%) |  |
| Trauma | 30 (4.5%) | 34 (5.1%) |  |
| Chronic Disease, n (%) |  |  |  |
| Diabetes | 160 (24.0%) | 162 (24.3%) | 0.950 |
| COPD | 138 (20.7%) | 144 (21.6%) | 0.730 |
| Chronic Renal Failure | 59 (8.8%) | 58 (8.7%) | 0.999 |
| Haematology/Oncology/Immunology | 132 (19.8%) | 133 (19.9%) | 0.999 |
| Chronic Heart Failure | 63 (9.4%) | 61 (9.1%) | 0.924 |
| Chronic Liver Fail | 30 (4.5%) | 28 (4.2%) | 0.896 |
| Home ventilation | 14 (2.1%) | 8 (1.2%) | 0.286 |
| Risk factors for ARDS, n (%) |  |  |  |
| Pneumonia | 387 (57.9%) | 387 (57.9%) | 0.999 |
| Non-pulmonary sepsis | 105 (15.7%) | 106 (15.9%) | 0.999 |
| Aspiration | 114 (17.1%) | 122 (18.3%) | 0.598 |
| Trauma | 44 (6.6%) | 38 (5.7%) | 0.566 |
| Inhalation | 16 (2.4%) | 23 (3.4%) | 0.337 |
| Pancreatitis | 18 (2.7%) | 17 (2.5%) | 0.999 |
| Burn | 4 (0.6%) | 1 (0.1%) | 0.371 |
| Pulmonary vasculitis | 7 (1.0%) | 8 (1.2%) | 0.999 |
| Non-cardiogenic shock | 48 (7.2%) | 56 (8.4%) | 0.483 |
| Drowning | 1 (0.1%) | 0 (0.0%) | NA |
| Overdose | 14 (2.1%) | 17 (2.5%) | 0.719 |
| TRALI | 27 (4.0%) | 31 (4.6%) | 0.677 |
| NO risk factor | 36 (6.5) | 44 (7.9) | 0.794 |
| ARDS severity n (%) |  |  | 0.594 |
| Mild | 169 (25.3%) | 167 (25.0%) |  |
| Moderate | 343 (51.3%) | 326 (48.8%) |  |
| Severe | 156 (23.4%) | 175 (26.2%) |  |
| PaO2:FiO2 ratio, mean per mmHg | 169.4±61.9 | 169.5±62.8 | 0.977 |
| Non pulmonary SOFA score | 7.1±3.8 | 7.0±3.8 | 0.832 |
| Ventilation variables,  mean day 1 and 2 (SD) |  |  |  |
| FiO2, median [IQR] | 0.6 [0.4;0.7] | 0.6 [0.5;0.8] | 0.001 |
| VT, mL/kg PBW | 7.8±1.8 | 7.6±1.5 | 0.005 |
| Respiratory rate (actual) | 21.3±5.4 | 20.1±5.2 | <0.001 |
| Standardized minute ventilation (L) | 11.14±3.97 | 10.69±4.17 | 0.032 |
| PEEP, cmH2O | 8.7±2.9 | 8.6±3.0 | 0.726 |
| Plateau pressure, cm H2O\* | 22.0±5.9 | 23.5±5.5 | 0.031 |
| Peak inspiratory pressure, cmH2O | 25.2±6.8 | 29.4±7.6 | <0.001 |
| Compliance, mL/cm H2O | 43.8±34.6 | 37.7±31.0 | 0.340 |
| PaCO2 mean (95% CI), mmHg | 40.5±12.3 | 41.9±14.5 | 0.063 |
| pH, mean ±SD | 7.34±0.10 | 7.33±0.10 | 0.358 |
| No. of ICU beds, median [IQR] | 16.0 [10.0;24.0] | 16.0 [10.0;24.0] | 0.884 |
| Duration of mechanical ventilation, median [IQR], d | 8.0 [4.0;14.0] | 10.0 [5.0;17.0] | 0.001 |
| Invasive ventilator free-days to day 28, median [IQR], d | 14.5 [0.0;22.0] | 7.0 [0.0;20.0] | <0.001 |
| ICU length of stay, median [IQR], d | 10.0 [6.0;18.0] | 12.0 [7.0;22.0] | 0.004 |
| Hospital length of stay, median [IQR], d | 17.0 [9.0;30.8] | 19.0 [10.0;34.0] | 0.083 |
| Treatment limitations, n (%) | 153 (22.9%) | 165 (24.7%) | 0.8497 |
| ICU mortality, n (%) | 216 (32.3%) | 253 (37.9%) | 0.038 |
| Hospital mortality, n (%) | 252 (37.7%) | 282 (42.2%) | 0.106 |

\* Data for plateau pressure was available for 646 patients

\*\* Data for compliance was available for 643 patients

**eTable 12**: Clinical variables and outcomes of patients with ARDS with fully spontaneous breathing activity (SB-F group) and without spontaneous breathing activity (C group) in the Propensity Score matched sample

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | SB-F group n=89 | C group n=89 | p-value |
| Age, yr, mean (SD) | 63.5±17.1 | 62.0±17.9 | 0.554 |
| Males, n (%) | 52 (58.4%) | 66 (74.2%) | 0.050 |
| Height, cm, mean (SD) | 168.3±9.8 | 169.4±9.8 | 0.482 |
| Weight kg, mean (SD) | 76.7±18.7 | 74.2±15.6 | 0.317 |
| Admission type, n (%) |  |  | 0.533 |
| Medical | 61 (68.5%) | 54 (60.7%) |  |
| Surgical (post-op elective) | 8 (9.0%) | 9 (10.1%) |  |
| Surgical | 17 (19.1%) | 19 (21.3%) |  |
| Trauma | 3 (3.4%) | 7 (7.9%) |  |
| Chronic Disease, n (%) |  |  |  |
| Diabetes | 18 (20.2%) | 19 (21.3%) | 0.999 |
| COPD | 14 (15.7%) | 15 (16.9%) | 0. 999 |
| Chronic Renal Failure | 7 (7.9%) | 5 (5.6%) | 0.773 |
| Haematology/Oncology/Immunology | 15 (16.9%) | 17 (19.1%) | 0.850 |
| Chronic Heart Failure | 9 (10.1%) | 8 (9.0%) | 0.999 |
| Chronic Liver Fail | 5 (5.6%) | 3 (3.4%) | 0.724 |
| Home ventilation | 3 (3.4%) | 0 (0.0%) | 0.248 |
| Risk factors for ARDS, n (%) |  |  |  |
| Pneumonia | 48 (53.9%) | 49 (55.1%) | 0.999 |
| Non-pulmonary sepsis | 17 (19.1%) | 14 (15.7%) | 0.710 |
| Aspiration | 14 (15.7%) | 14 (15.7%) | 0.999 |
| Trauma | 4 (4.5%) | 7 (7.9%) | 0.547 |
| Inhalation | 4 (4.5%) | 1 (1.1%) | 0.371 |
| Pancreatitis | 2 (2.2%) | 1 (1.1%) | 0.999 |
| Burn | 1 (1.1%) | 0 (0.0%) | 0. 999 |
| Pulmonary vasculitis | 1 (1.1%) | 1 (1.1%) | 0.999 |
| Non-cardiogenic shock | 10 (11.2%) | 5 (5.6%) | 0.267 |
| Drowning | 1 (1.1%) | 0 (0.0%) | 0.999 |
| Overdose | 2 (2.2%) | 0 (0.0%) | 0.480 |
| TRALI | 3 (3.4%) | 2 (2.2%) | 0.999 |
| NO risk factor | 5 (5.6%) | 9 (10.1%) | 0.423 |
| ARDS severity n (%) |  |  | 0.203 |
| Mild | 36 (40.4%) | 40 (44.9%) |  |
| Moderate | 44 (49.4%) | 33 (37.1%) |  |
| Severe | 9 (10.1%) | 16 (18.0%) |  |
| PaO2:FiO2 ratio, mean per mmHg | 189.7±59.7 | 197.1±65.3 | 0.444 |
| Non pulmonary SOFA score | 6.8±3.5 | 6.3±3.3 | 0.511 |
| Ventilation variables,  mean day 1 and 2 (SD) |  |  |  |
| FiO2, median [IQR] | 0.4 [0.4;0.6] | 0.5 [0.4;0.6] | 0.030 |
| VT, mL/kg PBW | 7.9±1.7 | 7.9±1.8 | 0.052 |
| Respiratory rate (actual) | 19.4±6.1 | 19.2±4.7 | 0.152 |
| Standardized minute ventilation (L) | 9.84±4.16 | 10.30±3.47 | 0.439 |
| PEEP, cmH2O | 8.3±2.7 | 8.5±3.0 | 0.443 |
| Plateau pressure, cm H2O\* | ----- | 20.7±5.5 | NA |
| Peak inspiratory pressure, cmH2O | 21.9±4.4 | 22.3±4.6 | 0.409 |
| Compliance, mL/cm H2O | ----- | 38.6±10.7 | 0.340 |
| PaCO2 mean (95% CI), mmHg | 38.4±13.3 | 38.1±11.0 | 0.860 |
| pH, mean ±SD | 7.37±0.08 | 7.37±0.08 | 0.642 |
| No. of ICU beds, median [IQR] | 16.0 [12.0;24.0] | 17.0 [10.0;20.0] | 0.257 |
| Duration of mechanical ventilation, median [IQR], d | 8.0 [4.0;13.8] | 9.0 [6.0;17.0] | 0.197 |
| Invasive ventilator free-days to day 28, median [IQR], d | 15.0 [0.0;22.0] | 14.0 [0.0;22.0] | 0.923 |
| ICU length of stay, median [IQR], d | 11.0 [7.0;19.0] | 13.0 [7.0;23.0] | 0.143 |
| Hospital length of stay, median [IQR], d | 18.0 [9.0;33.0] | 20.0 [13.0;39.0] | 0.204 |
| Treatment limitations, n (%) | 23 (25.8%) | 19 (21.3%) | 0.596 |
| ICU mortality, n (%) | 25 (28.1%) | 24 (27.0%) | 0.999 |
| Hospital mortality, n (%) | 31 (34.8%) | 25 (28.1%) | 0.405 |

**eTable 13**: Clinical variables and outcomes of patients with ARDS with fully spontaneous breathing activity (SB-F group) and without spontaneous breathing activity (C group) in the Propensity Score matched sample, when peak inspiratory pressure, pCO2, respiratory rate, minute ventilation and tidal volume was excluded from the model.

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | SB-F group n=166 | C group n=166 | p-value |
| Age, yr, mean (SD) | 64.9±16.2 | 63.1±17.6 | 0.313 |
| Males, n (%) | 104 (62.7%) | 107 (64.5%) | 0.815 |
| Height, cm, mean (SD) | 168.7±9.9 | 169.2±8.5 | 0.630 |
| Weight kg, mean (SD) | 75.3±18.2 | 75.7±20.1 | 0.850 |
| Admission type, n (%) |  |  | 0.439 |
| Medical | 113 (68.1%) | 114 (68.7%) |  |
| Surgical (post-op elective) | 14 (8.4%) | 12 (7.2%) |  |
| Surgical | 30 (18.1%) | 35 (21.1%) |  |
| Trauma | 9 (5.4%) | 5 (3.0%) |  |
| Chronic Disease, n (%) |  |  |  |
| Diabetes | 35 (21.1%) | 39 (23.5%) | 0.694 |
| COPD | 31 (18.7%) | 35 (21.1%) | 0.689 |
| Chronic Renal Failure | 13 (7.8%) | 14 (8.4%) | 0.999 |
| Haematology/Oncology/Immunology | 33 (19.9%) | 30 (18.1%) | 0.771 |
| Chronic Heart Failure | 14 (8.4%) | 18 (10.8%) | 0.571 |
| Chronic Liver Fail | 7 (4.2%) | 10 (6.0%) | 0.606 |
| Home ventilation | 4 (2.4%) | 1 (0.6%) | 0.371 |
| Risk factors for ARDS, n (%) |  |  |  |
| Pneumonia | 88 (53.0%) | 79 (47.6%) | 0.380 |
| Non-pulmonary sepsis | 25 (15.1%) | 24 (14.5%) | 0.999 |
| Aspiration | 28 (16.9%) | 31 (18.7%) | 0.783 |
| Trauma | 11 (6.6%) | 7 (4.2%) | 0.480 |
| Inhalation | 4 (2.4%) | 7 (4.2%) | 0.547 |
| Pancreatitis | 5 (3.0%) | 6 (3.6%) | 0.999 |
| Burn | 2 (1.2%) | 0 (0.0%) | 0.480 |
| Pulmonary vasculitis | 1 (0.6%) | 1 (0.6%) | 0.999 |
| Non-cardiogenic shock | 16 (9.6%) | 11 (6.6%) | 0.404 |
| Drowning | 1 (0.6%) | 0 (0.0%) | 0.999 |
| Overdose | 3 (1.8%) | 4 (2.4%) | 0.999 |
| TRALI | 3 (1.8%) | 1 (0.6%) | 0.617 |
| NO risk factor | 17 (10.2%) | 19 (11.4%) | 0.794 |
| ARDS severity n (%) |  |  | 0.068 |
| Mild | 72 (43.4%) | 61 (36.7%) |  |
| Moderate | 80 (48.2%) | 80 (48.2%) |  |
| Severe | 14 (8.4%) | 25 (15.1%) |  |
| PaO2:FiO2 ratio, mean per mmHg | 194.4±59.0 | 199.3±64.2 | 0.436 |
| Non pulmonary SOFA score | 6.0±3.5 | 5.9±3.6 | 0.912 |
| Ventilation variables,  mean day 1 and 2 (SD) |  |  |  |
| FiO2, median [IQR] | 0.4 [0.4;0.6] | 0.5 [0.4;0.6] | <0.001 |
| VT, mL/kg PBW | 8.0±1.7 | 7.5±1.3 | 0.005 |
| Respiratory rate (actual) | 20.7±5.9 | 18.8±4.7 | 0.001 |
| Standardized minute ventilation (L) | 10.3±3.8 | 9.37±2.8 | 0.003 |
| PEEP, cmH2O | 7.9±2.5 | 7.8±2.6 | 0.699 |
| Plateau pressure, cm H2O\* | ---- | 22.5±5.7 | NA |
| Peak inspiratory pressure, cmH2O | 19.3±4.9 | 28.1±7.4 | <0.001 |
| Compliance, mL/cm H2O | ----- | 35.8±16.0 | NA |
| PaCO2 mean (95% CI), mmHg | 37.1±12.7 | 39.3±12.2 | 0.117 |
| pH, mean ±SD | 7.39±0.07 | 7.39±0.08 | 0.628 |
| No. of ICU beds, median [IQR] | 16.0 [12.0;24.0] | 16.5 [11.2;24.0] | 0.601 |
| Duration of mechanical ventilation, median [IQR], d | 7.0 [4.0;14.0] | 9.0 [5.0;15.0] | 0.225 |
| Invasive ventilator free-days to day 28, median [IQR], d | 15.0 [0.0;23.0] | 14.0 [0.0;21.0] | 0.252 |
| ICU length of stay, median [IQR], d | 11 [7; 19] | 11 [7;20] | 0.730 |
| Hospital length of stay, median [IQR], d | 20.0 [11.0;35.0] | 19.0 [10.0;33.0] | 0.247 |
| Treatment limitations, n (%) | 40 (24.1%) | 40 (24.1%) | 0.999 |
| ICU mortality, n (%) | 47 (28.3%) | 57 (34.3%) | 0.289 |
| Hospital mortality, n (%) | 61 (36.7%) | 62 (37.3%) | 0.999 |

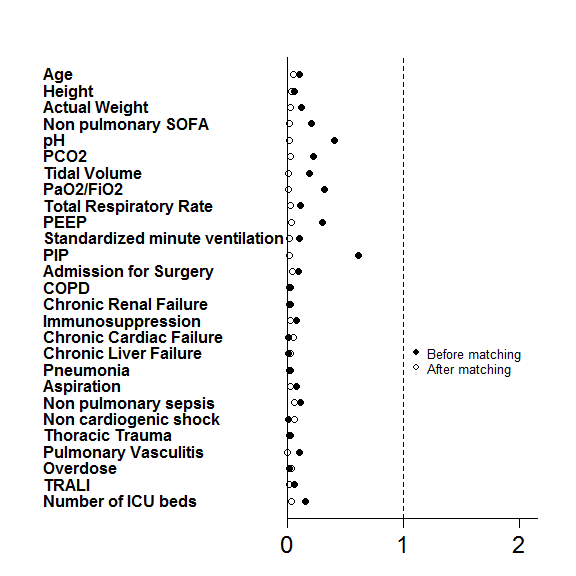
**eFigure 1.** Distribution of ventilatory modes on day 1 and 2 in patients in the partially spontaneous breathing group (SB-P)

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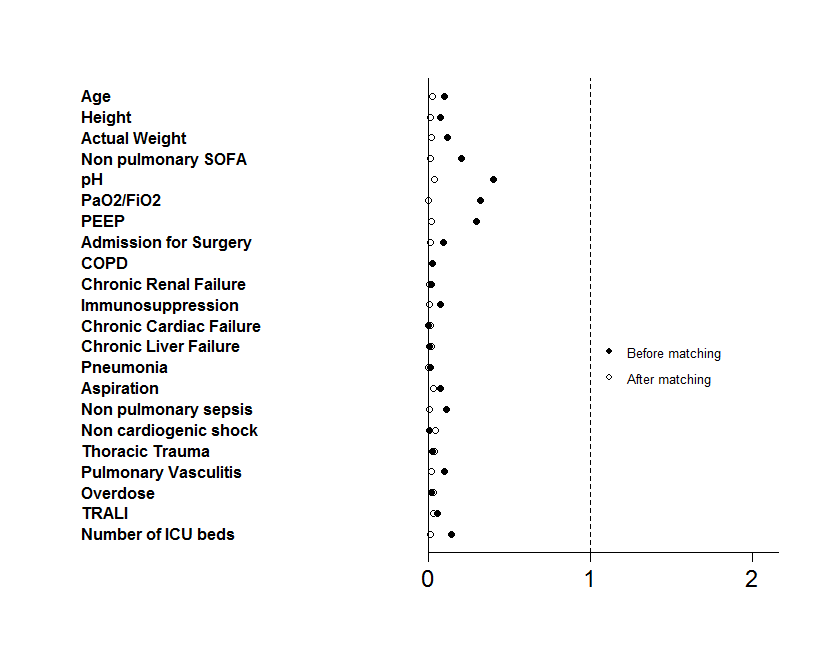
**eFigure 2.** Tidal volume (mean of day 1 and 2) in survivors and non-survivors in all patients with ARDS and stratified by ARDS severity (mild, moderate and severe)

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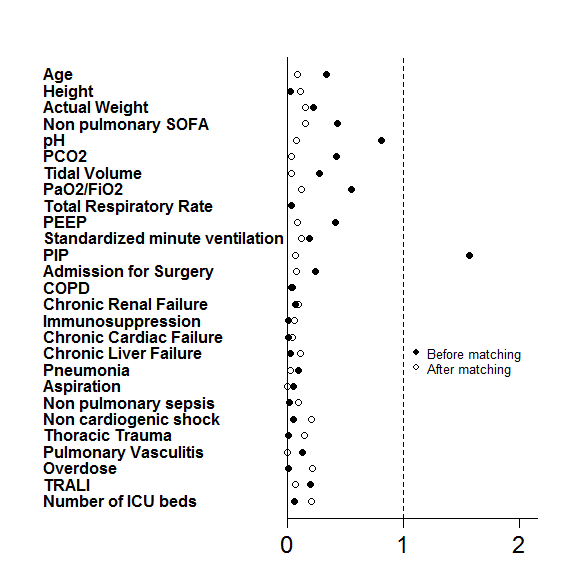
**eFigure 3:** Quality of propensity score matching C-group and SB-group (figure of standard differences)



**eFigure 4:** Quality of propensity score matching C-group and SB-group (figure of standard differences), when peak inspiratory pressure, pCO2, respiratory rate, minute ventilation and tidal volume was excluded from the model.



**eFigure 5:** Quality of propensity score matching C-group and SB-F group (figure of standard differences)



**eFigure 6:** Quality of propensity score matching C-group and SB-F group (figure of standard differences) when peak inspiratory pressure, pCO2, respiratory rate, minute ventilation and tidal volume was excluded from the model.

