**Supplementary table 1. Characteristics of COVID-19 disease at hospital presentation**

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| --- | --- | --- | --- | --- |
|  | **Overall**(n=400) | **Barotrauma** (n=200) | **No barotrauma**(n=200) | ***p-value*** |
| **Days from symptoms onset and hospital admission**, median (IQR) | 7 (5-10) | 7 (5-10) | 7 (5-10) | 0.173 |
| **WHO score\*** , n/N (%)<2$\geq $2 | 23/393 (5.9)370/393 (94.2) | 10/193 (5.2)183/193 (94.8) | 13 (6.5)187 (93.5) | 0.578 |
| **qCSI score**, median (IQR) | 5 (2-9) | 6 (5-10) | 4 (0-7) | **<0.001** |
| **4C score**, median (IQR)  | 10 (8-12) | 11 (8-13) | 9 (7-12) | **<0.001** |
| **PaO2/FiO2 ratio**, median (IQR)  | 214 (127-286) | 190 (130-265) | 242.4 (127-300) | **0.004** |
| **Respiratory rate**, median (IQR)  | 22 (18-26) | 23.5 (18-28) | 20 (18-25) | **0.001** |
| **(A-a)DO2**, median (IQR)  | 44.8 (33.8-53) | 45 (32.8-52.5) | 43.5 (36.8-53.3) | 0.972 |
| **Extent (%) of lung involvement**, n/N (%)0-24%25-49%50-74%≥75% | 29/323 (9.0)102/323 (31.6)126/323 (39.0)66/323 (20.4) | 7/147 (4.8)30/147 (20.4)73/147 (49.7)37/147 (25.2) | 22/176 (12.5)72/176 (40.9)53/176 (30.1)29/176 (16.5) | **<0.001** |
| **CT scan severity score (Salaffi et al)**, n/N (%)Normal lung parenchymaAt least 75% GGO/crazy paving patternCombination of GGO opacities/crazy paving pattern and consolidation provided that each accounts for less than 75%At least 75% consolidation | 5/291 (1.7)119/291 (40.9)154/291 (52.9)13/291 (4.5) | 1/137 (0.7)57/137 (41.6)77/137 (56.2)2/137 (1.5)  | 4/154 (2.6)62/154 (40.3)77/154 (50)11/154 (7.1)  | 0.058 |
| **Other radiological findings** |  |  |  |  |
| CavitationsPleural effusionAir bronchogramThromboembolism | 5/384 (1.3)63/380 (16.6)30/386 (7.8)65/395 (16.5) | 4 (2)10 (5)18 (9)52(26.3%) | 1/184 (0.5)20/186 (10.8)45/180 (25)13 (6.6%) | 0.374**0.035****<0.001****<0.001** |

Legend. \*1: asymptomatic or presymptomatic infection;2 : mild illness;3: moderate illness; 4: severe illness;5 :critical illness (A-a)DO2: alveolar-arterial gradient ; GGO : ground glass opacity; PaO2/FiO2 ratio: ratio of arterial oxygen partial pressure (paO2 in mmHg) to the fraction of inspired oxygen (FiO2), IQR: interquartile range, CT: chest thomography

**Supplementary table 2. Laboratory tests at admission**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Overall**(n=400) | **Barotrauma** (n=200) | **No barotrauma**(n=200) | ***p-value*** |
| **White blood cells (n/µL)**, median (IQR) | 6805 (4340-9260) | 6635 (3850-9230) | 6910 (4900-9500) | 0.181 |
| **Lymphocytes count(n/µL)**, median (IQR) | 700 (480-1060) | 636 (460-990) | 772 (500-1090) | **0.015** |
| **CRP (mg/L) al ricovero**, median (IQR) | 76.0 (29.4-129.5) | 87.2 (28.1-145) | 69.8 (30-114.8) | 0.094 |
| **PCT (ng/mL)**, median (IQR) | 0.13 (0.07-0.34) | 0.18 (0.07-0.41) | 0.12 (0.06-0.26) | **0.002** |
| **Proadrenomedullin (mmol/L)**, median (IQR) | 1.05 (0.79-1.44) | 0.96 (1.19-1.58) | 0.93 (0.72-1.29) | **0.001** |
| **Interleukin-6 (pg/mL)**, median (IQR) | 1.05 (0.79-1.44) | 65.6 (26-130) | 31.9 (16-66) | **<0.001** |
| **LDH (UI/L)**, median (IQR) | 509.5 (362-716) | 559.5 (362-807) | 467.5 (359.5-643.5) | **0.007** |
| **D-dimer test (FeU/mL)**, median (IQR) | 763 (478-1383) | 966.5 (551.5-1999) | 655 (414-1100) | **<0.001** |

Legend. CRP: C reactive protein; PCT: procalcitonin; LDH: lactate dehydrogenase; IQR: interquartile range

**Supplementary table 3. Barotrauma events according to escalation ventilatory support or not.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **n (%)** | **N=400** | **No barotrauma** (N=200) | **Barotrauma**(N=200) | **p-value** |
| **Only COT****Only HFNO****Only CPAP/PSV****Only IMV****Escalation COT-HFNO****Escalation COT-HFNO-CPAP/PSV****Escalation COT-HFNO-CPAP/PSV-IMV** | 89 (22.3)10 (6.8)83 (20.8)16 (4)17 (4.3)85 (21.3)100 (25) | 70 (35)9 (4.5)41 (20.5)6 (3)10 (5)31 (15.5)33 (16.5) | 19 (9.5)1 (0.5)42 (21)10 (5)7 (3.5)54 (27)67 (33.5) | **<0.001** |

**Supplementary table 4. Sovrainfections during hospital stay**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Overall**(n=400) | **Barotrauma** (n=200) | **No barotrauma**(n=200) | ***p-value*** |
| **Antibiotic administration**, n (%) | 311 (77.8) | 182 (91) | 129 (64.5) | **<0.001** |
| **Bacterial co-infections**, n (%) | 74 (18.5) | 50 (25) | 24 (12) | **0.001** |
| **Fungal co-infections**, n (%) | 54 (13.5) | 46 (23) | 8 (4) | **<0.001** |

**Supplementary table 4. Outcomes**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Overall**(n=400) | **Barotrauma** (n=200) | **No barotrauma**(n=200) | ***p-value*** |
| **Lenght of hospital stay, days**, median (IQR) | 19 (11-34) | 27 (16-45) | 12 (8-21) | **<0.001** |
| **Deaths**, n/N(%) | 142/395 (36.0) | 108/197 (54.8) | 34/198 (17.2) | **<0.001** |

Legend. IQR: interquartile range.