

Table 1. Patient's demographic characteristics, comorbidities, medications and laboratory values at inclusion

	Overall (n=116)	Survivors (n=17)	Non-Survivors (n=99)	p
Demographics				
Age, years	70.0 [60.3-78.0]	66.0 [59.0- 81.5]	70.0 [61.0-78.0]	0.645
Males, n (%)	64 (55.2)	7 (41.2)	57.0 (57.6)	0.209
Height, cm	175.0 [165.5-180.0]	167.0 [165.0- 179.0]	175.0 [167.0- 180.0]	0.186
BMI, kg/m ²	31.2 [28.4- 34.3]	32.5 [30.7- 34.5]	31.0 [28.2-34.3]	0.078
Comorbidities, n (%)				0.751
Hypertension	87 (75.0)	12 (70.6)	75 (75.8)	
Diabetes Mellitus	45 (38.8)	6 (35.3)	39 (39.4)	
Ischemic heart disease	36 (31.0)	5 (29.4)	31 (31.3)	
Congestive heart failure	9 (7.8)	0 (0)	9 (9.1)	
Atrial fibrillation	19 (16.4)	0 (0)	19 (19.2)	
Obesity	40 (34.5)	6 (35.3)	34 (34.3)	
COPD/Asthma	11 (9.5)	3 (17.6)	8 (8.1)	

History of stroke	7 (6.0)	0 (0)	7 (70.7)	
Cerebrovascular disease	8 (6.9)	1 (5.9)	7 (70.7)	
History of Cancer	9 (7.8)	1 (5.9)	8 (8.1)	
History of MI	12 (10.3)	0 (0)	12 (12.1)	
Pulmonary hypertension	3 (2.6)	0 (0)	3 (3.0)	
Smoking history:				0.645
Former smokers, n (%)	9 (7.8)	1 (5.9)	8 (8.1)	
Active smokers, n (%)	3 (2.6)	0 (0)	3 (3.0)	
ACE inhibitors or ARB, n (%)	82 (70.7)	11 (64.7)	71 (71.7)	
Time from onset, days	13 [9-18]	12 [9-14]	13 [9-21]	0.103
SOFA score	6 [5-8]	6 [5-7]	6 [5-9]	0.345
Treatment, n(%)				
Hydroxychloroquine	110 (94.8)	17 (100.0)	93 (93.9)	
Lopinavir/ritonavir	23 (19.8)	3 (17.6)	15 (15.2)	
Dexamethasone (8-20 mg/day)	116 (100.0)	17 (100.0)	99 (100.0)	1.000
UFH or LWH «low dose»	5 (4.3)	1 (5.9)	4 (4.0)	

UFH or LWH «high dose»	111 (95.7)	16 (94.1)	95 (95.9)	
Anticytokine therapy				
Tocilizumab	18 (15.5)	5 (29.4)	13.0 (13.1)	0.258
Sarilumab	5 (4.3)	1 (5.9)	4.0 (4.0)	
Tofacitinib	1 (0.9)	1 (5.9)	0 (0)	
Laboratory values				
WBC, 10 ⁹ /l	11.1 [8.1-15.3]	9.6 [7.8-15.8]	11.5 [8.4-15.2]	0.494
Lymphocytes, 10 ⁹ /l	0.7 [0.4-0.9]	0.5 [0.5-0.8]	0.7 [0.4-0.9]	0.431
D-dimer, mcg/ml	3.3 [1.6-6.8]	3.3 [2.0-6.0]	3.3 [1.6-7.3]	0.751
Fibrinogen, g/l	7.5 [5.7-9.4]	6.9 [5.3-10.6]	7.6 [5.7-9.4]	0.785
Creatinine, mcg/l	97.0 [75.8-136.7]	89.0 [66.0-114.2]	99.0 [76.0-139.0]	0.240
LDH, U/l	996.5 [833.3-1347.8]	859.5 [716.3-1137.8]	1025.5 [842.5-1428.5]	0.114
CRP, mg/l	160.1 [100.3-246.9]	163.1 [118.3-234.1]	157.2 [98.0-257.8]	0.984

Data presented as medians [interquartile range] or n (%) where appropriate. Differences between groups: Mann-Whitney U-test, Chi-square or Fisher exact test where appropriate. p-value: comparison between survivors and non-survivors.

Abbreviations: BMI: body mass index; COPD: chronic obstructive lung disease; MI: myocardial infarction; ACE: angiotensin-converting enzyme; ARB: angiotensin-receptor blocker; SOFA: sequential organ failure assessment; UFH: unfractionated heparin; LWH: low weight heparin; WBC: white blood cells; LDH: lactate dehydrogenase; CRP: C-reactive protein.

Table 2. Respiratory parameters, ventilatory settings and adjunctive interventions during mechanical ventilation course

		Day 1	Day 3	Day 5	Day 7	Day 10	Day 14	Day 21
Oxygenation status								
PaO ₂ , mmHg	S	77.0 [66.4-89.0]	85.0 [76.5-106.5]	82.0 [73.1-103.8]	81.2 * [76.7-99.1]	85.5 ** [77.3-91.0]	92.5 § [83.2-106.5]	78.5 [70.9-105.6]
	N S	75.0 [61.0-91.8]	81.0 [64.2-103.0]	78.0 [60.6-97.3]	77.0 [65.0-83.8]	72.4 [61.7-79.5]	69.0 [55.3-78.0]	80.8 [76.9-87.3]
FiO ₂ , unit	S	0.60 ** [0.50-0.75]	0.50 § [0.48-0.60]	0.60 § [0.50-0.60]	0.50 § [0.41-0.55]	0.40 § [0.35-0.50]	0.40 § [0.31-0.49]	0.40 ** [0.30-0.40]
	N S	0.75 [0.60-0.90]	0.70 [0.60-0.80]	0.70 [0.60-0.90]	0.65 [0.58-0.80]	0.80 [0.60-1.00]	0.85 [0.60-1.00]	0.70 [0.70-0.74]
PaO ₂ /FiO ₂ , mmHg	S	136.6 * [106.7-160.8]	170.6 ** [124.2-210.0]	150.0 ** [124.7-213.0]	161.7 § [141.6-245.2]	221.0 § [170.5-246.3]	252.7 § [169.8-316.7]	240.0 * [159.2-409.2]
	N S	105.5 [76.2-141.7]	125.0 [83.1-153.7]	112.0 [80.3-161.3]	108.9 [85.6-148.3]	92.2 [67.5-150.0]	79.0 [56.5-128.6]	116.2 [109.9-131.7]
PEEP, cmH ₂ O	S	12.0 [10.0-12.0]	11.0 [10.0-14.0]	11.0 [10.0-14.0]	10.0 [10.0-12.0]	9.0 * [7.0-11.5]	8.5 [5.0-11.0]	7.0 [5.3-8.0]

	N	11.0 [10.0-13.0]	12.0 [10.0-13.0]	10.0 [9.0-12.0]	10.0 [8.0-12.0]	10.0 [8.3-11.8]	10.0 [8.0-14.5]	9.5 [8.3-11.5]
Ventilation status								
Tidal volume, ml/kg IBW	S	8.2 [7.3-8.8]	8.1 [7.0-8.8]	8.2 [7.0-8.9]	8.0 [7.2-9.6]	8.1 [7.1-10.6]	7.6 [6.3-8.8]	7.9 [7.4-10.8]
	N	7.7 [7.1-8.2]	7.7 [7.2-8.2]	7.9 [7.1-8.4]	7.9 [7.1-8.8]	7.9 [7.3-8.7]	8.2 [7.1-9.0]	7.8 [6.7-9.1]
Total RR, min ⁻¹	S	20 [18-22]	20 [18-22]	20 [18-22] *	21 [17-23]	20 [17-22] *	23 [20-25]	22 [15-23]
	N	21 [18-24]	22 [18-24]	23 [20-26]	22 [18-25]	23 [19-25]	23 [20-28]	23 [22-29]
Minute ventilation, l/min	S	10.0 [8.5-12.0]	10.0 [8.6-11.3]	9.9 ** [8.1-11.5]	10.6 [8.2-13.7]	10.6 [9.1-12.0]	11.1 [8.0-12.8]	12.1 [8.5-15.7]
	N	11.0 [9.0-13.2]	10.7 [9.0-13.0]	11.7 [10.5-14.0]	11.5 [9.6-13.2]	12.2 [9.5-14.8]	12.6 [10.0-13.6]	10.7 [9.1-12.0]
PaCO ₂ , mmHg	S	47.0 [40.0-61.4]	52.1 [39.3-61.6]	42.0 [38.0-55.2]	40.0 [34.6-45.6]	39.5 ** [35.5-44.6]	40.0 [36.4-43.8]	43.6 [37.4-48.0]
	N	47.9 [40.3-56.5]	49.5 [42.3-58.1]	46.4 [40.7-54.2]	45.0 [40.5-55.5]	47.0 [39.5-58.5]	48.0 [37.4-58.0]	45.8 [37.6-73.8]
Ventilatory ratio	S	1.9 [1.6-2.6]	1.9 [1.7-2.6]	2.0 [1.5-2.2]	1.9 [1.5-2.1]	1.8 [1.5-2.1] **	1.7 [1.6-2.1] **	2.2 [1.3-2.4]
	N	2.2 [1.7-2.7]	2.2 [1.7-2.7]	2.2 [1.8-2.7]	2.1 [1.7-2.8]	2.5 [1.9-3.2]	2.5 [1.9-3.2]	2.7 [1.9-3.2]
VD _{alv} /V _T , %	S	0.39 [0.17-0.46]	0.38 [0.28-0.50]	0.33 [0.24-0.41]	0.24 ** [0.19-0.31]	0.26 ** [0.20-0.33]	0.30 [0.25-0.39]	0.30 [0.21-0.44]
	N	0.36 [0.27-0.46]	0.38 [0.30-0.48]	0.37 [0.24-0.45]	0.37 [0.25-0.45]	0.40 [0.29-0.51]	0.29 [0.22-0.41]	0.31 [0.15-0.52]
Respiratory mechanics								

C _{RS} , ml/cmH ₂ O	S	38.4 [30.6-45.6]	37.0 [28.7-38.3]	39.8 [31.0-49.0]	42.2 * [29.4-49.0]	38.8 [28.2-45.3]	32.3 [25.3-46.3]	31.0 [25.0-43.0]
	N S	34.5 [25.0-42.3]	36.1 [26.2-42.3]	32.5 [25.0-41.5]	32.0 [24.5-41.8]	30.0 [26.0-37.3]	28.0 [20.7-43.5]	28.3 [15.0-39.0]
Plateau pressure, cmH ₂ O	S	25.0 [23.5-27.5]	25.0 [24.0-30.0]	24.0 * [22.5-27.5]	23.0 ** [22.0-25.0]	23.0 ** [20.3-25.5]	22.5 ** [19.5-27.3]	19.0 [15.0-19.0]
	N S	27.0 [24.0-31.0]	27.0 [24.0-30.0]	28.0 [24.0-31.5]	27.0 [24.0-31.0]	26.5 [24.0-30.8]	29.0 [24.5-36.5]	28.0 [22.3-34.5]
Driving pressure, cmH ₂ O	S	13.5 [11.0-15.0]	14.0 [12.5-15.0]	13.0 * [10.5-15.0]	12.5 ** [10.3-14.8]	13.5 ** [11.0-15.8]	16.0 [11.5-17.5]	16.5 [13.0-22.3]
	N S	15.0 [12.0-20.0]	14.5 [12.0-19.0]	16.0 [13.0-20.0]	17.0 [13.5-20.5]	17.5 [15.0-20.0]	17.0 [13.0-27.5]	18.0 [11.8-25.8]
Resistance, mbar/l/s	S	10.0 [7.5-13.0]	10.0 [8.0-12.0]	10.5 [8.3-12.0]	8.5 [6.3-10.0]	9.5 [7.3-11.0]	10.5 [8.0-12.3]	11.0 [7.8-12.8]
	N S	9.0 [6.0-12.0]	9.0 [7.0-12.0]	8.0 [7.0-11.0]	8.0 [7.0-10.0]	8.5 [7.3-12.0]	10.0 [7.5-12.5]	8.0 [6.3-12.0]
Adjunctive respiratory interventions								
Neuromuscular blockade, n (%)	S	13 (76.5)	9 (52.9) **	6 (35.3) §	3 (18.8) §	1 (6.3) §	1 (6.7) §	1 (14.3)
	N S	87 (87.9)	83 (84.7)	59 (80.8)	35 (71.4)	28 (87.5)	18 (85.7)	1 (25.0)
Prone position, n (%)	S	7 (41.2)	6 (35.3)	5 (29.4)	4 (25.0)	0 (0)	0 (0) **	0 (0)
	N S	49 (49.5)	35 (35.4)	22 (30.1)	8 (16.3)	3 (9.4)	5 (23.8)	1 (25.0)
Lateral position, n (%)	S	6 (35.3)	4 (23.5)	1 (5.9)	0 (0)	1 (6.3)	0 (0)	0 (0)
	N S	19 (19.2)	20 (20.2)	14 (19.2)	14 (28.6)	8 (25.0)	5 (23.8)	0 (0)
Organ support								

ECMO, n (%)	A	0	0	0	0	0	0	0
	I							
RRT, n (%)	S	1 (5.9)	1 (5.9)	0	0	1 (6.3)	0 *	0
	NS	2 (2.0)	3 (3.1)	4 (5.5)	7 (14.3)	5 (16.1)	5 (23.8)	0
NE, n (%)	S	0	0 *	1 (5.9) **	1 (6.3) **	2 (12.5) **	1 (7.1) §	0
	NS	19 (19.2)	27 (27.8)	32 (43.8)	21 (42.9)	18 (56.3)	14 (66.7)	2 (50.0)

Data presented as medians [interquartile range] or n (%) where appropriate. Differences between groups Mann-Whitney U-test, Chi-square or Fisher exact test where appropriate.

Abbreviations: S: Survivors; NS: Non-Survivors; PaO₂: arterial oxygen partial pressure; FiO₂: fraction of inspiratory oxygen; PEEP: positive end-expiratory pressure; IBW: ideal body weight; RR: respiratory rate; PaCO₂: arterial carbon dioxide partial pressure; V_Dalv/V_T: alveolar dead space to tidal volume ratio ; C_{RS}: compliance of the respiratory system; ECMO: extracorporeal membrane oxygenation; RRT: renal replacement therapy; NE: norepinephrine

* p-value < 0.05, comparison between survivors and non-survivors;

** p-value < 0.01, comparison between survivors and non-survivors;

§ p-value < 0.001, comparison between survivors and non-survivors.