Supplementary Table S1. Patient characteristics and comorbidities.

Characteristics (n [%] unless otherwise indicated)	All (n = 50)	Survivors[a] (n = 34)	Non-survivors[a] (n = 16)	p[b]
Age, median (IQR)	64 (53–77)	59.5 (53–75)	71 (54–81)	0.174
< 55	16 (32)	11 (32.4)	5 (31.3)	1.0
55-64	9 (18)	8 (23.5)	1 (6.3)	0.2396
65-74	9 (18)	6 (17.6)	3 (18.8)	1.0
≥ 74	16 (32)	9 (26.5)	7 (43.8)	0.3302
Male sex, *n* [%]	39 (78)	26 (76)	13 (81)	1.0
Blood group in the ABO system				
Group A	17 (34)	10 (29.4)	7 (43.8)	0.3526
Group O	20 (40)	13 (38.2)	7 (43.8)	0.7635
Group B	12 (24)	10 (29.4)	2 (12.5)	0.2923
Group AB	1 (2)	1 (2.9)	0	1.0
Comorbidities				
Obesity[c] (BMI ≥ 30)	15 (30)	9 (26.5)	6 (37.5)	0.5142
Arterial hypertension	28 (56)	17 (50.0)	11 (68.8)	0.2404
Diabetes mellitus on insulin	13 (26)	8 (23.5)	5 (31.3)	0.7310
Coronary heart disease	12 (24)	7 (20.6)	5 (31.3)	0.4859
Congestive heart failure	4 (8)	3 (8.8)	1 (6.3)	1.0
COPD	4 (8)	2 (5.9)	2 (12.5)	0.5843
Bronchial asthma	2 (4)	1 (2.9)	1 (6.3)	0.5420
Chronic or end-stage kidney disease[d]	10 (20)	6 (17.6)	4 (25.0)	0.7067
Cancer	13 (26)	9 (26.5)	4 (25.0)	1.0
Chronic liver disease	4 (8)	2 (5.9)	2 (12.5)	0.5843
Immunosuppression	6 (12)	4 (11.8)	2 (12.5)	1.0
HIV infection	1 (2)	1 (2.9)	0	1.0

[a] until outcome day 60 from ICU admission;

[b] Chi Square or Wilcoxon rank-sum test for group comparison (survivors *vs* non-survivors);

[c] calculated as weight in kilograms divided by height in squared meters;

[d] based on a diagnosis in medical history by *ICD-10* coding.

Supplementary Table S2. Laboratory findings.

Lab findings on day of admission	All (n = 50)	Survivors[a] (n = 34)	Non-survivors[a] (n = 16)	p[b]
Lymphocytes (G/l), median (IQR)	0.67 (0.49–0.90)	0.72 (0.56–0.94)	0.49 (0.42–0.70)	0.5961
Lymphocytes < 25% of Leucs, n (%)	46 (92)	31 (91.2)	15 (93.8)	1.0
Albumin: < 3.5 g/dl, n (%)	35 (70)	23 (67.6)	12 (75)	0.7455
25-OH-Vit D_3: ≤ 30 ng/ml, n (%)	38 (76)	26 (76)	12 (75)	1.0
25-OH-Vit D_3: ≤ 12 ng/ml, n (%)	21 (42)	14 (41.2)	7 (43.8)	
Lab findings on day of intubation (median [IQR])	All (*n* = 43)	Survivors[a] (*n* =27)	Non-survivors[a] (*n* = 16)	
Leucocytes (G/l)	8.4 (2.1–18.48)	8.4 (3.6–16.16)	8.93 (2.1–18.48)	
CRP (mg/dl)	17 (4.7–35)	20.6 (4.7–35)	10.5 (5–33.7)	
Il6 (pg/ml)	144 (24–9,990)	183 (35–793)	120 (24–9,990)	
PCT (ng/ml)	0.3 (0.1–4.9)	0.3 (0.1–4.9)	0.4 (0.1–3.7)	
DDimer (µg/l FEU)	2,903 (777–77,630)	2588 (777–77,630)	4705 (1,355–36,969)	
LDH (U/l)	525 (135–2,020)	486 (135–1,097)	733 (309–2,020)	
Lab findings on day of first proning (median [IQR])	All (*n* = 22)	Survivors[a] (*n* = 13)	Non-survivors[a] (*n* = 9)	
Leucocytes (G/l)	9.1 (0.93–19.13)	11.95 (5.56–19.13)	8.19 (0.93–14.61)	
CRP (mg/dl)	26.6 (5.8–45.9)	26.05 (13.7–36.1)	26.8 (5.8–45.9)	
Il6 (pg/ml)	243 (102–9990)	161 (102–1011)	2172 (446–9990)	
PCT (ng/ml)	0.9 (0.1–14.6)	0.85 (0.1–14.6)	1.1 (0.4–3.7)	
DDimer (µg/l FEU)	6,038 (1,725–129,000)	5,825 (1,725–55,525)	6,038 (3,544–129,000)	
LDH (U/l)	458 (277–1097)	447 (277–1097)	470 (326–865)	
Lab findings on day of ECMO (median [IQR])	All (n = 7)	Survivors[a] (n = 3)	Non-survivors[a] (n = 4)	
Leucocytes (G/l)	9.31 (4.58–25.5)	19.99 (12.6–25.5)	7.4 (4.58–9.31)	
CRP (mg/dl)	23.3 (15.1–34.2)	16.1 (15.1–31)	27.7 (18.9–34.2)	
Il6 (pg/ml)	264 (84–11,014)	112 (84–415)	3248 (109–11,014)	
PCT (ng/ml)	5 (0.2–13.7)	5 (2.3–13.7)	3.25 (0.2–7.5)	
DDimer (µg/l FEU)	9,473 (908–35,000)	13,735 (5,210–19,373)	4917 (908–35,000)	
LDH (U/l)	385 (347–435)	385 (365–421)	391 (347–435)	

[a] until outcome day 60 from ICU admission;

[b] Chi Square or Wilcoxon rank-sum test for group comparison (survivors *vs* non-survivors).

Supplementary Table S3. Durations of treatment steps.

Duration in days, median (IQR)	All (n = 50)	Survivors[a] (n = 34)	Non-survivors[a] (n = 16)	P[b]
Symptom onset to hospital admission	4 (1–7)	4 (3–8)	1 (0–4)	0.0051
Symptom onset to ICU admission	7 (4–10)	8 (5–12)	5 (3–7)	0.0238
ICU admission to intubation	0 (0–1)	0 (0–1)	0 (0–1)	0.6312
Mechanical ventilation	18 (8–39)	18 (8.5–41)	17 (8–35)	0.6527
On ventilator before initiation of ECMO	9 (6–11)	11 (10–16)	7 (4–10)	n. a.
On ECMO	29 (17–35)	32 (31–41)	17 (4–31)	n. a.
ICU admission to first negative PCR	16 (10–22)	16 (11–22)	16 (10–20)	0.8887
Hospital stay	31 (17–48)	35 (20–55)	19 (12–39)	0.03
ICU stay	17 (9–38)	17 (9–41)	18 (9–35)	0.8026

SOFA (Sequential Organ Failure Assessment); IQR (interquartile range); CRRT (Continuous Renal Replacement Therapy); ARDS (Adult Respiratory Distress Syndrom); ECMO (Extracorporal Membrane Oxygenation);

[a] until outcome day 60 from ICU admission;

[b] Chi Square or Wilcoxon rank-sum test for group comparison (survivors *vs* non-survivors)

Supplementary Table S4. Treatment.

Treatment or intervention median (IQR) unless otherwise indicated	All (n = 50)	Survivors[a] (n = 34)	Non-survivors[a] (n = 16)	P[b]
Remdesivir, n (%)	9 (18)	5 (14.7)	4 (25)	0.44
Convalescent plasma, n (%)	6 (12)	2 (5.9)	4 (25)	0.07
CRRT, n (%)	20 (40)	12 (35.3)	8 (50)	0.3662
Vasopressor, n (%)	42 (84)	26 (76.4)	16 (100)	0.0429
NIV or HFNO before intubation, n (%)	4 (9.3)	3 (8.8)	1 (6.3)	1.0
Mechanical ventilation, n (%)	43 (86)	27 (79.4)	16 (100)	0.0812
Horovitz on day of intubation (mmHg)	160 (113–216)	159 (118–218)	167 (105–209)	0.7566
Peak pressure on day of intubation (mbar)	25 (23–28)	25 (23–28)	26 (23–28)	0.992
PEEP on day of intubation (mbar)	10 (10–14)	10.5 (10–13.5)	10 (8–12)	0.0836
ARDS[c] present, n (% of ventilated patients)	39 (90.7)	25 (92.6)	14 (87.5)	0.6208
Mild ARDS, n (% of ventilated patients)	11 (28)	8 (32)	4 (28.6)	1.0
Moderate ARDS, n (% of ventilated patients)	19 (48.7)	12 (49)	7 (50)	1.0
Severe ARDS, n (% of ventilated patients)	9 (23.1)	5 (20)	3 (21.4)	1.0
Intensified sedation[d] (% of ventilated patients)	30 (70)	19 (70.4)	11 (68.8)	0.0542
Proning maneuvers n (% of ventilated patients)	22 (51.2)	13 (48.1)	9 (56.3)	0.7546
Number of proning maneuvers[e]	4 (3–7)	3 (3–4)	7 (5–13)	0.032
Horovitz before proning (mmHg)	87 (72–107)	88 (70–103)	85 (73–127)	0.6745
Horovitz average during first proning (mmHg)	135 (115–155)	129 (116–160)	143.5 (116–175)	0.888
Tracheostomy, n (% of ventilated patients)	16 (37.2)	10 (37)	6 (37.5)	1.0
ECMO, n (%)	7 (14)	3 (8.8)	4 (25)	0.1903
SOFA at day of ECMO	10 (10–11)	11 (11–12)	10 (9–10)	n.a.

SOFA (Sequential Organ Failure Assessment); IQR (interquartile range); CRRT (Continuous Renal Replacement Therapy); ARDS (Adult Respiratory Distress Syndrome); ECMO (Extracorporeal Membrane Oxygenation);

[a] Until outcome day 60 from ICU admission;

[b] Chi Square or Wilcoxon rank-sum test for group comparison (survivors *vs* non-survivors);

[c] ARDS according to Berlin definition present on day of intubation;

[d] Three or more sedatives needed in parallel during first week of ventilation;

[e] during ICU stay prior to initiation of ECMO.