

Variable	Derivation cohort			Validation cohort		
	ARF worsening at D15		p	ARF worsening at D15		p
	No (n = 63)	Yes (n = 29)		No (n = 45)	Yes (n = 14)	
Demographics						
Age, yrs	63 (13)	69 (8)	0.02	63 (14)	64 (13)	0.73
BMI, kg/m ²	31 (6)	29 (5)	0.26	31 (7)	32 (6)	0.65
Gender, female	16 (25)	5 (17)	0.55	13 (29)	2 (14)	0.48
No comorbidities ^a	17 (27)	10 (34)	0.46	10 (22)	4 (29)	0.72
BMI > 30	29 (46)	9 (31)	0.17	21 (47)	7 (50)	0.83
Diabetes	20 (32)	9 (31)	1	14 (31)	4 (29)	1
Chronic respiratory failure	4 (6)	6 (21)	0.09	0 (0)	1 (7)	0.24
COPD	10 (16)	6 (21)	0.79	5 (11)	6 (43)	0.01
Chronic heart failure	6 (9)	4 (14)	0.8	5 (11)	3 (21)	0.38
Cirrhosis Child B or C	1 (2)	0 (0)	1	0 (0)	0 (0)	1
End stage kidney disease ^b	4 (6)	4 (14)	0.44	3 (7)	2 (14)	0.58
Immunocompromised ^y	4 (6)	6 (21)	0.09	6 (13)	2 (14)	1
Characteristics of disease on ICU admission						
SAPS2	35 (8)	38 (8)	0.2	32 (11)	37 (7)	0.14
SOFA	2.5 (0.9)	2.8 (1.5)	0.2	2.8 (1.4)	2.9 (1.3)	0.84
FiO ₂ , %	77 (20)	88 (16)	0.01	70 (20)	84 (16)	0.01
CT-scan extension, %	48 (19)	45 (20)	0.62	47 (21)	60 (21)	0.08
Predominant findings on CT-scan						
Ground-glass opacities	39 (62)	17 (59)	0.76	26 (58)	10 (71)	0.55
Consolidation	13 (21)	3 (10)	0.36	8 (18)	3 (21)	0.71
Pulmonary embolism	10 (16)	6 (21)	0.79	3 (7)	1 (7)	1
Purulent sputum	8 (13)	2 (7)	0.5	5 (11)	2 (14)	0.67
Microbiologically confirmed bacterial co-infection ^d	4 (6)	2 (7)	1	5 (11)	0 (0)	0.33
Use of antibiotics prior to collection of microbiological specimens	20 (32)	10 (34)	0.98	12 (27)	7 (50)	0.12
Treatments on ICU admission						
CPAP H0 – H48 ^o	20 (32)	13 (45)	0.33	19 (42)	5 (36)	0.9
NIV H0 – H48 ^x	31 (49)	21 (72)	0.06	18 (40)	10 (71)	0.08
Prone positioning H0 – H48	11 (17)	3 (10)	0.57	9 (20)	2 (14)	1
Antibiotics	43 (68)	20 (69)	1	40 (89)	13 (93)	1
Tocilizumab	2 (3)	4 (14)	0.14	1 (2)	0 (0)	1
Remdesivir	5 (8)	4 (4)	0.62	4 (9)	0 (0)	0.56
Outcomes						
ICU mortality	1 (2)	22 (76)	<10⁻³	1 (2)	11 (79)	<10⁻³
ICU length of stay, days	9 (12)	21 (15)	<10⁻³	8 (5)	27 (17)	<10⁻³

Table 1. Patients' characteristics

Data are presented as number (%) or mean (SD). p values < 0.05 are indicated in bold characters. *ARF* Acute respiratory failure requiring intubation, *D15* Day 15 following ICU admission, *BMI* Body mass index, *COPD* Chronic obstructive pulmonary disease, *CPAP* Continuous positive airway pressure, *CT* Computed tomography, *FiO2* fraction of inspired oxygen, *ICU* Intensive care unit, *NIV* Non-invasive ventilation, *SAPS 2* Simplified acute physiology score 2, *SOFA* Sequential organ failure assessment. ^α No comorbidities among the following ones: BMI > 30, diabetes, chronic respiratory failure, COPD, chronic heart failure, cirrhosis child B or C, end stage kidney disease, immunocompromised. ^β End-stage kidney disease, defined as an estimated glomerular filtration rate eGFR of <30 mL/minute/1.73m² or patients undergoing renal replacement therapy. ^γ Immunocompromised subjects exhibited at least one of the following conditions: solid organ transplantation, haematopoietic stem cell transplantation in the last 6 months, corticosteroid therapy at a dosage higher than or equivalent to prednisone 1 mg/kg/day for more than 3 months, uncontrolled human immunodeficiency virus infection (<200 CD4/mm³), active solid malign tumor or hematologic malignancy in the last 6 months. ^δ Microbiologically confirmed bacterial co-infection defined by the positivity of any microbiological test performed within 48h of admission, including blood and sputum cultures, bronchoalveolar lavage fluids, multiplex PCRs on sputum, and urinary antigen tests for *Legionella pneumophila* and *Streptococcus pneumoniae*. ^φ CPAP was defined as the delivery of a preset pressure that is constant during both inhalation and exhalation using either ventilator with dedicated settings or Boussignac valve. ^χ NIV was defined as the delivery of a predetermined pressure (or volume) during inspiration in addition to providing positive end-expiratory pressure during exhalation. All subjects were treated by corticosteroids on ICU admission, accordingly with the inclusion criteria of our study.