

Table S1 The association between admission serum ionized calcium levels and hypercapnic respiratory failure requiring mechanical ventilation

Serum ionized calcium level at hospital admission (mg/dl)	Hypercarbic respiratory failure	Univariate analysis		Multivariate analysis	
		OR (95% CI)	p	Adjusted OR (95% CI)	P
≤4.39	81 (3.5)	4.12 (2.72-6.26)	<0.001	3.06 (1.99-4.71)	<0.001
4.40-4.59	70 (2.0)	2.31 (1.51-3.54)	<0.001	2.02 (1.32-3.12)	0.001
4.60-4.79	103 (1.5)	1.69 (1.13-2.53)	0.01	1.62 (1.08-2.43)	0.02
4.80-4.99	94 (1.3)	1.53 (1.02-2.30)	0.03	1.51 (0.98-2.27)	0.06
5.00-5.19	31 (0.9)	1 (ref)	-	1 (ref)	-
≥5.20	24 (1.2)	1.39 (0.82-2.38)	0.23	1.38 (0.80-2.37)	0.25

Adjusted for age, sex, race, eGFR, Charlson Comorbidity Score, history of coronary artery disease, hypertension, diabetes mellitus, congestive heart failure, chronic obstructive pulmonary disease, asthma, dementia, stroke, cirrhosis, end-stage renal disease, obesity, principal diagnosis, acute kidney injury and vasopressor use at hospital admission

Table S2 Clinical characteristics between patients with and without admission ionized calcium measurement

	No admission ionized calcium measurement	Included patients	p-value
Age (year)	61±18	63±17	<0.001
Male	53%	54%	<0.001
Caucasian	93%	92%	<0.001
GFR (ml/min/1.73m ²)	78±28	73±32	<0.001
Charlson score	1.8±2.3	2.3±2.6	<0.001
Principal diagnosis			<0.001
- Cardiovascular	21%	22%	
- Hematology/Oncology	15%	21%	
- Infectious disease	3%	4%	
- Endocrine/metabolic	3%	4%	
- Respiratory	4%	4%	
- Gastrointestinal	9%	11%	
- Genitourinary	4%	4%	
- Injury and poisoning	15%	13%	
- Other	25%	16%	

Figure S1 study flow chart