

Supplementary appendix: Coronavirus Disease 2019 (COVID-19) in Older Patients: Outcomes and Risks of Mortality.

IRB: New York Medical College 14258

Definitions

Acute kidney injury: increase in serum creatinine by ≥ 0.3 mg/dl (≥ 26.5 $\mu\text{mol/l}$) within 48 h, or increase in serum creatinine to ≥ 1.5 times baseline, which is known or presumed to have occurred within the prior 7 days, or urine volume < 0.5 ml/kg/h for 6 h [1].

Acute hepatic dysfunction: increase in aspartate aminotransferase (AST) or alanine aminotransferase (ALT) twice the upper limit of normal.

Improvement/deterioration in clinical status

Improved oxygenation: more than 25% decrease on oxygen requirement from baseline, change from invasive to non-invasive ventilation.

Worsening oxygenation: more than 25% increase in oxygen requirement from baseline or change from non-invasive to invasive ventilation.

Improved kidney function: If not on haemodialysis: sustained decrease in serum creatinine to baseline after acute kidney injury over the study period. If on new haemodialysis during hospitalization: patient coming off haemodialysis during the study period.

Co-morbid conditions

Chronic kidney disease, dementia, depression, diabetes mellitus, haemodialysis, hypertension, hypothyroidism, malignancy (any), smoker (ever): as noted in the electronic health record

Chronic lung disease: asthma, chronic obstructive pulmonary disease, emphysema

Chronic heart disease: coronary artery disease, cardiomyopathy, arrhythmias, receipt of pacemaker/defibrillator

Vascular disease: ischaemic stroke, peripheral arterial disease by imaging, vascular studies or history in electronic AD, PVD

Chronic liver disease: cirrhosis, chronic hepatitis
Immunosuppression: receipt of transplantation, malignancy (haematological and non-haematological), iatrogenic chronic immune suppression

Neurological disorders: any disorder of the central nervous system

Recurrent serious bacterial infections – requiring 2 or more hospitalizations within the past 12 months for intravenous antibiotic therapy

1. Kellum JA, Lameire N, Aspelin P, et al. Kidney Disease: Improving Global Outcomes CKD Work Group. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney Int Suppl* 2013; 3: 1-150.

Supplementary Table S1. Association of Factors with Survival

Variable	Survival						P-value
	Lived			Died			
	Count	%	Mean	Count	%	Mean	
Total patients discharged alive or dead	130	66.3		66	33.7		
Characteristics on admission:							
Residence	39	57.4		29	42.6		0.053
Home	91	71.1		37	28.9		
Age	30	75.0		10	25.0		–
Age 65–69	37	71.2		15	28.8		
Age 70–74	24	77.4		7	22.6		
75–79	39	53.4		34	46.6		0.003
80 and older	9	64.3		5	35.7		0.828
Race/ethnicity	15	71.4		6	28.6		
Asian or other	23	71.9		9	28.1		
Black	82	64.6		45	35.4		
Hispanic			27.2	5.5		27.2	6.2
White							0.984
Body mass index (mean, SD)							
< 23	24	64.9		13	35.10		0.938
23–30	60	64.5		33	35.50		
> 30	29	61.7		18	38.30		
Primary DX	86	67.2		42	32.8		0.975
COVID	13	65.0		7	35.0		
COVID and other	31	66.0		16	34.0		
Other and COVID	74	66.7		37	33.3		0.908
Sex	10	43.5		13	56.5		0.014
Male	120	69.4		53	30.6		
DNR/DNI/							
Full measures	118	72.8		44	27.2		< 0.001
Resuscitation status (on admission)	7	24.1		22	75.9		
No change							
Changed							

Variable	Survival						P-value	
	Lived			Died				
	Count	%	Mean	N, SD	Count	%		Mean
Comorbidities: Total	130	66.3			66	33.7		
Any cardiac-HTN	99	67.3			48	32.7		0.601
Diabetes	45	68.2			21	31.8		0.695
Chronic respiratory disease (any)	19	63.3			11	36.7		0.706
Malignancy (any)	10	58.8			7	41.2		0.493
Chronic kidney disease	9	50.0			9	50.0		0.124
Depression	7	43.8			9	56.3		0.046
Neurological disorders (any)	13	41.9			18	58.1		0.002
Obesity	27	64.3			15	35.7		0.752
Total comorbidities per patient			4	2			4	2
Symptoms on admission total:	130	66.3			66	33.7		
Days since first symptom/onset			6	4			5	5
Shortness of breath	76	61.3			48	38.7		
Cough	72	69.9			31	30.1		0.265
Fever	68	64.8			37	35.2		0.619
AMS on admission	18	51.4			17	48.6		< 0.001
Nausea	13	86.7			2	13.3		0.040
Admission vital signs:								
O ₂ lowest ≥ 90%	128	69	76.7		21	23.3		0.004
< 90%		59	57.3		44	42.7		
O ₂ – lowest prior to or on admission			89	7		83	12	
Temperature ≤ 100.4 (f)	126	88	63.8		50	36.2		0.226
> 100.4 (f)		38	73.1		14	26.9		
Temperature (f)			98.8	8.4		98.9	2.7	
Initial oxygen		35	79.5		9	20.5		0.028
NC/Ventimask		64	75.3		21	24.7		0.013
NRB		13	40.6		19	59.4		0.001
Mechanical ventilation		13	44.8		16	55.2		0.010

Variable	Survival						P-value	
	Lived			Died				
	Count	%	Mean	Count	%	Mean		SD
Admission labs:								
White blood cell count [$\times 10^9/l$]	122		7.9	3.2	66	16.1	37.3	0.016
Lymphocyte (percentage of total lymphocyte count)	122		14.6	10.2	65	13.3	16.4	
Creatine kinase [U/l]	94		281	406	55	644	1127	0.005
Brain-type natriuretic peptide [pg/ml]	70		167	261	36	471	628	0.001
Lactate dehydrogenase [U/l]	113		427	195	60	667	639	< 0.001
Ferritin [ng/ml]	108		1359	2568	59	1943	2102	–
D-dimer [ng/ml]			3.3	6.6		9.65	12.32	< 0.001
C-reactive protein [mg/dl]	111		13.0	9.3	59	19.79	12.45	< 0.001
Troponin [ng/ml]	103		.13	.44	57	0.46	1.17	0.012
Procalcitonin [ng/ml]	109		.54	.99	59	9.59	28.82	0.001
QT interval (corrected)	98		455	40	54	459	35	–
Hospital course – peak/Nadir labs:								
Lymphocyte (% of total count)	109		9.2	7.4	61	5.7	12.7	
Aspartate aminotransferase [U/l]	108		84	104	62	1709	3864	< 0.001
Creatinine [mg/dl]	122		1.8	2.3	65	3.93	3.08	< 0.001
Creatine kinase [U/l]	90		388	533	58	2591	5997	0.001
Brain-type natriuretic peptide [pg/ml]	34		208	449	18	768.1	1095	0.012
Lactate dehydrogenase [U/l]	101		522	252	57	2894	5152	< 0.001
Ferritin [ng/ml]	105		1983	2495	60	8010	11400	< 0.001
D-dimer [ng/ml]	97		10.4	12.9	63	21.83	13.84	< 0.001
C-reactive protein [mg/dl]	108		17.3	10.9	62	27.56	13.83	< 0.001
Procalcitonin [ng/ml]	84		2.9	12.8	39	16.38	34.62	0.002
Troponin [ng/ml]	95		0.57	2.5	55	2.85	8.61	0.017
In hospital medications:								
Any COVID-19-directed medication	130	66.3			66	33.7		
COVID-19-directed medication (total doses)	100	63.3			58	36.7		0.067
			11	13		12	13	

Variable	Survival						P-value
	Lived			Died			
	Count	%	Mean N, SD	Count	%	Mean SD	
Azithromycin	84	64.1		47	35.9		0.102
Hydroxychloroquine	93	67.9		44	32.1		0.482
Plasma	29	64.4		16	35.6		0.761
Steroid non-pulse dose	37	55.2		30	44.8		0.018
Pulse steroids	14	37.8		23	62.2		< 0.001
Tocilizumab	10	62.5		6	37.5		0.605
Outcomes:	130	66.3	14.1	66	33.7	13.5	12.5
Hospital days			17.5				0.754
Required intensive care	195	32	40.0	48	60.0		< 0.001
Days of ICUS			5.2			8.2	11.5
Required mechanical ventilation	183	22	33.8	43	66.2		< 0.001
Days of ventilation			5.0			8.8	11.8
Required vasopressor (any)	58	17	29.3	46	70.7		< 0.001
No longer needed	17	77.3		5	22.7		
Delirium	97	33	40.2	17	59.8		< 0.001
Resolved	20	95.2		1	4.8		< 0.001
New Hepatic dysfunction/ transaminitis (AST ≥ 2× normal)	43	49.4		44	50.6		< 0.001
Improved or resolved	26	83.9		5	16.1		< 0.001
New Renal failure	35	43.2		46	56.8		< 0.001
Renal failure Remained abnormal no RRT	35	6	30.0	14	70.0		–
Worsened RRT needed	5	14.7		29	85.3		< 0.001
Improved no RRT	24	88.9		3	11.1		< 0.001
Oxygen re-quirements during hos-pital course	91	79	97.5	2	2.5		< 0.001
Increased during hos-pital course	4	11.4		31	88.6		< 0.001
Unchanged	8	29.6		19	70.4		< 0.001

SD – standard deviation, O₂ – Oxygen, (f) – Fahrenheit, NC – nasal cannula, NRB – non-rebreather mass, RRT – renal replacement therapy, WBC – total white blood cell count, CK – creatine kinase, BNP – brain natriuretic peptide, LDH – lactate dehydrogenase, CRP – C-reactive protein, AST – aspartate transaminase, Cr – creatinine, Levine’s test used to determine whether or not equal variances were assumed.