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Letter to the Editor

Comment on: "Beyond Chronological Age: Frailty and Multimorbidity Predict In-hospital Mortality in Patients With Coronavirus Disease 2019"

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Dear Editor,

We read with great interest the article by Alessandra Marengoni et al., evaluating whether frailty and multimorbidity predict in-hospital mortality in patients with COVID-19 beyond chronological age (1). This interesting question has been on the mind of every physician providing acute medical care to older COVID-19 patients during what has been the most deadly outbreak in the world since Spanish Influenza in 1918. Compared with younger patients, older patients are disproportionately affected and at a much higher risk of mortality: The fatality rate is evaluated at up to 30% in patients aged over 80 years compared with up to 5% in the population as a whole (2). Previous observational studies report that older age and comorbidities are associated with a higher rate of mortality (3–7).

However, whether older age is an independent predictor of in hospital mortality after careful adjustment on comorbidities and frailty remains a matter of debate. As highlighted by Marengoni et al., the frequent use of chronological age in decision-making for questions that may include access to intensive care, poses serious ethical problems in the absence of solid evidence in support of such decisions (8). From their observational data on 165 hospitalized patients, the authors conclude that frailty and multimorbidity are independent predictors of mortality and should therefore be assessed, and not only chronological age. They consider that these 2 conditions are worth embedding in the decision-making process for COVID-19 patients.

In this context, observational studies assessing the respective prognostic weight of comorbidities, frailty, and age in geriatric setting are particularly welcome. Notably, Mendes et al. recently reported interesting results confirming these conclusions (9): In 235 patients hospitalized with COVID-19 with a mean age of 86 years, frailty, comorbidities, and functional status, but not age per se, were independent risk factors for mortality.

In a multicenter observational study of patients aged > 75 years in COVID-19 geriatric units of 4 hospitals in Burgundy, one of the most affected regions in France, we sought to confirm such findings. We therefore included all consecutive patients aged > 75 years and hospitalized for COVID-19 (with positive RT-PCR test). Clinical presentation, comorbidities, and dependence were recorded at admission. The World Health Organization (WHO) severity score was evaluated at admission according to current guidelines (10). Factors associated with 1-month mortality were evaluated in univariate and multivariate analyses using a Cox regression model. This study was approved by the local ethics committee.

We included 142 consecutive patients with a median age of 86 years, and each patient was followed up for 1 month after admission. Overall, 48 (33.8%) patients had died by the end of follow-up. As shown in Table 1, after adjustment on other prognostic factors, older age remained scarcely associated with 1-month mortality (adjusted hazard ratio [95% confidence interval]: HR = 1.07 [1.00–1.14]), whereas male sex (HR = 2.21 [1.00–4.88]) and high Charlson Comorbidity Index scores (HR = 1.16 [1.02–1.30]) were independently associated with a worse prognosis. Dependence, however, was not significantly associated with short-term prognosis. Concerning clinical parameters at admission with prognostic value, heart rate (HR = 1.02 [1.00–1.04]), and WHO severity score (HR = 2.23 [1.31–3.80]) remained strongly associated with poorer outcomes.

Table 1. Parameters at Admission Associated With 1-Month Mortality in Older COVID-19 Inpatients (*n* [%] or median [interquartile range])

	Alive *n* = 95	Dead *n* = 48	*p* Value (univariate analysis)	Adjusted HR (multivariate analysis)
Age (years)	86 [81–89]	87 [83–91]	.12	1.07 (1.00–1.14)*
Men	44 (46)	31 (65)	.04	2.21 (1.00–4.88)*
Body mass index (kg/m²)	24 [21–27]	25 [21–28]	.79	
Acquisition site				
Community	67 (70)	31 (65)	.47	
Nursing home	27 (28)	15 (31)	.72	
Hospital	17 (18)	16 (33)	.04	
Dependence				
Walk alone	40 (42)	18 (37)	.37	
Walk with help	47 (49)	22 (46)	.15	
Bedridden	8 (8)	8 (17)	.14	
ADL scale < 3	16 (17)	11 (23)	.38	
Comorbidities				
Chronic heart failure	19 (20)	13 (27)	.34	
Myocardial infarction	18 (19)	8 (17)	.78	
Cerebrovascular disease	26 (27)	20 (42)	.08	
Neurocognitive disorders	38 (40)	26 (54)	.11	
Chronic lung disease	17 (18)	2 (4)	.02	
Diabetes	20 (21)	10 (21)	.96	
Chronic liver disease	2 (4)	5 (8)	.04	
Chronic kidney disease	10 (10)	13 (27)	.01	
Cancer	20 (21)	14 (29)	.28	
Charlson Index	2 [1–4]	3 [2–5]	.001	1.16 (1.02–1.30)*
Clinical parameters				
Heart rate (/min)	77 [69–87]	85 [73–99]	.005	1.02 (1.00–1.04)*
SBP (mmHg)	134 [118–150]	132 [114–145]	.37	
DBP (mmHg)	69 [59–78]	70 [61–82]	.43	
Temperature (°C)	37.2 [36.7–37.8]	37.3 [36.5–37.8]	.91	
Respiratory rate (/min)	30 [22–32]	30 [23–32]	.41	
WHO COVID-19 score	2 [2–3]	3 [2–3]	<.001	2.23 (1.31–3.80)*

Note: ADL = Activity of daily living; DBP = Diastolic blood pressure; SBP = Systolic blood pressure; WHO COVID-19 score = World Health Organization COVID-19 severity score, (10).

*$p < .05$.

In conclusion, these findings support Marengoni's proposal that comorbidities should be considered in the decision-making process for older COVID-19 patients more than chronological age alone. Moreover, the short-term prognosis is above all driven by the acute clinical presentation, even in frail older adults.

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