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Phillip A. Horwitz, MD  
Mary Vaughan Sarrazin, PhD

\*University of Iowa  
200 Hawkins Drive, E315 GH  
Iowa City, Iowa 52242  
E-mail: [amgad-mentias@uiowa.edu](mailto:amgad-mentias@uiowa.edu) OR  
[dr.amgadgamal@gmail.com](mailto:dr.amgadgamal@gmail.com)  
Twitter: @amgadmentias  
<https://doi.org/10.1016/j.jacc.2020.09.581>

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The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the [JACC author instructions page](#).

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## Are We Missing Something in the Management of Acute Coronary Syndromes in COVID-19-Negative Patients?



We read with great interest the paper by Bhatt et al. (1) comparing acute cardiovascular hospitalizations in 2019 and 2020, reporting a decline in the total number of hospitalizations and a significantly longer median length of stay (LOS) in patients admitted during the coronavirus disease 2019 (COVID-19) pandemic.

These data have prompted us to conduct a retrospective analysis to evaluate the impact of the

COVID-19 pandemic on the management of patients presenting with ST-segment elevation myocardial infarction (STEMI) during the first month of the Italian lockdown. Clinical outcome in this class of patients is influenced by time delay to treatment. We have analyzed all the components of the ischemic time (patient delay + system delay) to assess in-hospital outcomes (major adverse cardiovascular events) (Table 1).

We confirm a mild decrease in the number of ST-segment elevation-acute coronary syndrome hospitalizations in 2020 compared with the same period in 2019. Notably, in patients negative for COVID-19, we were not able to detect a remarkable "patient delay," but we observed a significant prolongation of the time from patient arrival at the percutaneous coronary intervention center to wire crossing, mainly due to the requirement of testing negativity for severe acute respiratory syndrome coronavirus 2 infection. These results were coupled with a significant increase of in-hospital major adverse cardiovascular events but not of LOS, pointing to the occurrence of early complications.

It is key to note that implementing STEMI chain of survival with adjunctive measures required by the COVID-19 pandemic may negatively affect the management of patients presenting with acute cardiovascular conditions, and whose negativity cannot be ensured, as recently reported also by Wilson et al. (2).

Elongation of total ischemic time might be appropriate for risk-benefit clinical evaluation in patients with COVID-19. Conversely, delayed reperfusion in patients without COVID-19 is not justified and does not provide clinical advantage in risk stratification. In addition, although patient delay could be shortened by improving patients' awareness and by overcoming the fear of entering hospitals, system delay has to be readily modifiable by organizational measures.

As this pandemic has offered the framework to focus on missing clinical priorities, data from Bhatt et al. (1), along with our report, confirm that ensuring a timely treatment of acute coronary syndromes makes no exception.

\*Domenico D'Amario, MD, PhD  
Daniele Rodolico, MS  
Luigi Cappannoli, MD  
Stefano Migliaro, MD  
Filippo Crea, MD

\*Department of Cardiovascular Sciences  
Fondazione Policlinico Universitario Agostino Gemelli  
IRCCS

**TABLE 1 Comparison of COVID-Negative Patients Presenting With ACS in 2019 and 2020**

	Admissions 2019 (n = 26)	Admissions 2020 (n = 22)	p Value
Male	32 (66.7)	15 (57.7)	0.221
Age, yrs	71 ± 14	70.7 ± 15.9	0.649
Hypertension	31 (64.6)	20 (76.9)	0.072
Diabetes	12 (25)	6 (23.1)	0.751
Smoking	11 (23)	6 (23.1)	1.00
Dyslipidemia	18 (37.5)	10 (38.5)	1.00
Access by ambulance	30 (62.5)	12 (46.2)	0.017
Pre-coronary time, h	7 (3-12)	7 (3.5-12.0)	0.786
Symptoms onset to FMC, min	241 (120-731)	311 (188-649)	0.541
ED arrival to diagnosis, min	13.5 (8.0-37.5)	9 (7-37)	0.087
ED arrival to ED discharge, min	33 (10-60)	17 (7-46)	0.075
ED discharge to cath-lab arrival, min	39 (21-54)	38 (18-54)	0.274
Cath-lab arrival to wire crossing, min	33 (26-40)	31 (24-39)	0.291
Symptoms onset to wire crossing, min	495 (224-997)	417 (245-820)	0.410
ED admission to wire crossing, min	105 (84-206)	94 (84-136)	0.038*
Length of stay, days	8 (6-13)	7.5 (6-11)	0.395
GRACE	164 (140-188)	173.5 (144.2; 192.5)	0.768
In-hospital MACE	7 (15.2)	1 (3.8)	0.038*

Values are n (%), mean ± SD, or median (interquartile range). \*p < 0.05.  
ACS = acute coronary syndromes; Cath-lab = catheterization laboratory; COVID = coronavirus disease; ED = emergency department; FMC = first medical contact; GRACE = Global Registry of Acute Coronary Events; MACE = major adverse cardiovascular events (including sustained ventricular arrhythmias, nonfatal stroke).

Largo Agostino Gemelli, 8  
00168 Rome  
Italy  
E-mail: [domenico.damario@policlinicogemelli.it](mailto:domenico.damario@policlinicogemelli.it)  
<https://doi.org/10.1016/j.jacc.2020.08.082>

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## REPLY: Are We Missing Something in the Management of Acute Coronary Syndromes in COVID-19-Negative Patients?



Experiences worldwide have observed fewer cardiovascular hospitalizations as the coronavirus disease 2019 (COVID-19) pandemic has swept across the globe (1). Although Dr. D'Amario and colleagues highlighted the case of ST-segment elevation myocardial

infarction, it appears this system-wide disruption in health care use has extended to other common cardiovascular and noncardiovascular conditions. Patients who have been hospitalized during this pandemic period represent a particularly high-risk cohort compared with historical control subjects. What may explain this seemingly outsized impact on hospitalizations for non-COVID-19 related conditions in the United States and worldwide?

Several ecological factors might have contributed. For instance, reduction in air pollution might have triggered less acute cardiopulmonary illnesses. Enhanced mitigation measures such as masks and physical distancing might have prevented transmission and spread of other viral or bacterial vectors (2). Changes in health behaviors, including reduction in fast food intake, might have contributed. However, because of the population-wide impact across diverse communities with different approaches to physical distancing, in addition to the magnitude of the reductions seen even early in the pandemic, it is unlikely that fewer hospitalizations could be attributable to these factors alone.

The indirect effects of the COVID-19 pandemic are likely to be far reaching. Patients and caregivers may be averse toward even necessary health care exposure during the pandemic. Established systems of care designed to facilitate expeditious care for high-risk cardiovascular presentations have been disrupted (3). This may lead to diagnostic or treatment