

CORONARY ARTERY DISEASE

Letter to the Editor

Unmasking psychological reasons of delay in acute coronary syndromes presentation during the COVID-19 pandemic

To the Editor:

The coronavirus disease 19 (COVID-19) pandemic is ongoing, leading several worldwide governments to issue restrictive measures affecting lifestyle, including lockdown.¹ As such, current challenges in interventional cardiology encompass modifications in the algorithms for diagnosis and treatment, compliance toward unfamiliar clinical scenarios and reorganization of the acute coronary syndrome (ACS) treatment network.²

During the pandemic, a drop in hospital admissions of patients with ACS has been reported.³ Lockdown may have an impact on ACS epidemiology and clinical presentation due to multiple potential mechanisms at play, including modification of individual behaviors.⁴ In particular, patients may be worried of being infected thus neglecting symptoms underlying serious cardiac conditions and delaying their access to care. Notably, such impaired decision-making capability may be also influenced by the high stress levels generated by the lockdown and the pandemic in general.⁵ There is a poor understanding and quantification of the psychological factors behind the observed drop in ACS hospitalization during the COVID-19 pandemic.

In 2020, between March 18 and April 16 (local COVID-19 period), a total of 78 patients were referred to our center for invasive coronary angiography. Of them, 62.8% presented with an ACS and 57.1% with ST-segment elevation myocardial infarction (STEMI). These figures were sensibly different compared with an earlier 30-day time-frame (i.e., from January 18, 2020 to 16 February, 2020, non-COVID-19 period), when more patients were admitted (N = 152) and the proportions of ACS and STEMI were lower (51.9 and 34.5%, respectively). All patients treated for ACS in the pandemic period, except those who died before discharge (N = 5), were considered to be eligible for this study (N = 44). Of them, 29 consented to participate, hence representing the study cohort. To explore the impact of the COVID-19 pandemic on patients presenting with ACS, data about their access to the healthcare system were collected. Later access to care was defined based on the median time from symptoms onset among patients successfully interviewed (>12 hr). The study participants were interviewed via a phone call and were asked whether their access to care was delayed by any pandemic-related factor, especially the fear of contagion. Eleven patients out of 29 (37.9%) answered positively to this question. Since only one out of three patients with later access to care considered his/her call for help to be influenced by the pandemic, we hypothesized unconscious mechanisms underlying patients' delay. To assess the mental attitude toward the pandemic and forced lockdown, the validated Perceived Stress Scale (PSS-10) questionnaire was administered to all study participants at a mean of

20 ± 12 days from hospital discharge.⁶ PSS-10 is a widely used tool to appraise the stressful force of different situations and to evaluate to what extent individuals perceive their lives to be unpredictable, uncontrollable, or overloading. Patients were asked to rate the frequency of their negative feelings about life events over the previous month, from 0 (never) to 4 (very often). All patients successfully completed the interview and were split into higher-stress (N = 15) and

TABLE 1 Patients' characteristics in higher-stress versus lower-stress subgroups

Variables	Higher-stress (n = 15)	Lower-stress (n = 14)
<i>Demographic</i>		
Age, mean (±SD)	69.5 ± 12.9	63.4 ± 8.3
Male gender	9/15 (60.0%)	12/14 (85.7%)
<i>Clinical</i>		
Hypertension	10/15 (66.7%)	7/14 (50.0%)
Diabetes	1/15 (6.7%)	3/14 (21.4%)
Dyslipidaemia	5/15 (33.3%)	8/14 (57.1%)
Active smoker	4/14 (28.6%)	7/14 (50.0%)
Prior PCI or CABG	4/15 (26.7%)	4/14 (28.6%)
History of heart failure	3/12 (25.0%)	1/11 (9.1%)
<i>ACS presentation</i>		
STEMI	7/15 (46.7%)	8/14 (57.1%)
NSTEMI	8/15 (53.3%)	4/14 (28.6%)
Unstable angina	0/15 (0%)	2/14 (14.3%)
Delayed access to care	8/14 (57.1%)	6/13 (46.2%)
<i>Angiographic</i>		
No coronary lesions	2/15 (13.3%)	0/14 (0%)
Multivessel disease	7/15 (46.7%)	5/14 (35.7%)
<i>Labs</i>		
CK-MB (ng/ml), median (IQR)	29 (24–526)	112 (27–469)
Troponin I HS (ng/ml), median (IQR)	40 (19–5,386)	240 (25–2,183)

Abbreviations: ACS, acute coronary syndromes; CABG, coronary artery bypass grafting; CK-MB, creatine kinase-MB; HS, high sensitive; IQR, interquartile ranges; NSTEMI, non-ST elevation myocardial infarction; PAN, pandemic period; PCI, percutaneous coronary intervention; RAAS, renin angiotensin aldosterone system; RCA, right coronary artery; SD, standard deviation; STEMI, ST elevation myocardial infarction; TIA, transient ischemic attack.

lower-stress ($N = 14$) subgroups, based on the median PSS-10 value. Due to the small sample size, key comparative findings are reported with no p values and described for exploratory purposes. Among higher stress patients, 57.1% accessed later to care, while this proportion decreased to 46.2% among patients with lower stress levels. Interestingly, regardless of their actual delay in the call for help, up to 80% of patients admitting their later access to care due to the pandemic displayed higher stress levels according to the PSS-10 questionnaire. The higher-stress cohort was further characterized as follows: patients with higher stress levels were on average 6-year older (mean 69.5 ± 13 vs. 63.5 ± 8) and presented numerically with a higher prevalence of hypertension (66.7 vs. 50%) and female sex (40 vs. 14.3%). The higher-stress group was also more likely to present without critical lesions at coronary angiography (13.3 vs. 0%) and displayed lower median levels of cardiac biomarkers with respect to the lower-stress group (Table 1).

In summary, this survey suggests that pandemic-derived stress may be responsible for the behavior of ACS patients, influencing a propensity to delay the call for help. Patients who later accessed to care were often unaware of their delaying behaviors because pandemic-related stress seemed to play at unconscious level, largely hampering patients' self-perception capability.

These findings emphasize the need for unmasking in larger series the deep psychological reasons surrounding the delay in ACS presentation during the pandemic. Because ACS is a leading cause of death, understanding these mechanisms is of utmost importance to inform strategies aimed at patient reassurance and education.

ACKNOWLEDGMENT

We would like to thank all the patients participating in the current study and our colleagues Federica Agnello, Dario Calderone and Antonio Gabriele Franchina, who contributed to data collection and patients' interviewing.

Antonio Greco MD 

Marco Spagnolo MD 

Davide Capodanno MD, PhD 

C.A.S.T., A.O.U. "Policlinico-Vittorio Emanuele"—University of Catania,
Catania, Italy

Correspondence

Antonio Greco, MD, C.A.S.T., A.O.U. "Policlinico-Vittorio Emanuele"—
University of Catania, P.O. Rodolico, Ed. 8, Via Santa Sofia 78, Catania
95125, Italy.

Email: a.greco90@gmail.com

ORCID

Antonio Greco  <https://orcid.org/0000-0003-2926-9428>

Marco Spagnolo  <https://orcid.org/0000-0002-5434-607X>

Davide Capodanno  <https://orcid.org/0000-0002-5156-7723>

REFERENCES

1. Zhou P, Lou YX, Wang XG, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*. 2020;579(7798):270-273.
2. Chieffo A, Stefanini GG, Price S, et al. EAPCI position statement on invasive management of acute coronary syndromes during the COVID-19 pandemic. *EuroIntervention*. 2020;16:233-246. https://doi.org/10.4244/EIJY20M05_01.
3. Garcia S, Albaghdadi MS, Meraj PM, et al. Reduction in ST-segment elevation cardiac catheterization laboratory activations in the United States during COVID-19 pandemic. *J Am Coll Cardiol*. 2020;75(22):2871-2872.
4. Piepoli MF, Hoes AW, Agewall S, et al. 2016 European guidelines on cardiovascular disease prevention in clinical practice. *Eur Heart J*. 2016;37:2315-2381.
5. Moccia L, Janiri D, Pepe M, et al. Affective temperament, attachment style, and the psychological impact of the COVID-19 outbreak: an early report on the Italian general population. *Brain Behav Immun*. 2020;87:75-79. <https://doi.org/10.1016/j.bbi.2020.04.048>.
6. Cohen S. Perceived stress scale. *Psychology*. 1994.