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Research letters

# Remodeling of activities of Italian echocardiographic laboratories during the coronavirus disease 2019 lockdown: the SIECoVID study

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## To the Editor

To oppose the coronavirus disease 2019 (COVID-19) pandemic, cardiology divisions had to instantly reshape their activities,<sup>1</sup> with a profound impact on echocardiographic laboratories.<sup>2</sup> The aim of this study was to analyze the activity of echocardiographic laboratories during lockdown in Italy using a nationwide survey.

## Methods

We analyzed two different time windows: 1 month during national lockdown (study period, 10 March 2020–10 April 2020), and the corresponding month during 2019 (control period).

Data were retrieved via an electronic survey based on a structured questionnaire, uploaded on the website of the Italian Society of Echocardiography and Cardiovascular Imaging ([www.siec.it](http://www.siec.it)). Data were obtained from 82 centers from 16 regions in Italy.

## Results

During the 2020 lockdown period, cardiology hospital admissions decreased compared with 2019 ( $-52\%$ ,  $P < 0.001$ ), with a reduction in hospitalizations for acute coronary syndromes (ACS,  $-47\%$ ,  $P < 0.001$ ), decompensated acute heart failure (AHF,  $-35\%$ ,  $P = 0.004$ ), and arrhythmias ( $-51\%$ ,  $P < 0.001$ ) (Fig. 1a).

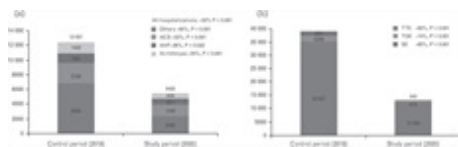


Fig. 1: (a) Lockdown and hospital admissions. Hospital admission in cardiology divisions during national lockdown (10 March 2020–10 April 2020, study period), and corresponding period during 2019 (10 March 2019–10 April 2019, control period). (b) Lockdown and echocardiographic lab activities. Echocardiographic laboratories activity during national lockdown (10 March 2020–10 April 2020, study period), and corresponding period during 2019 (10 March 2019–10 April 2019, control period). Transthoracic echocardiography, transesophageal echocardiography, stress echocardiography.

The effect of lockdown influenced also the activity of echocardiographic laboratories, with significant reduction in transthoracic echocardiography (TTE,  $-63\%$ ,  $P < 0.001$ ), transesophageal echocardiography (TEE,  $-73\%$ ,  $P < 0.001$ ), and stress echocardiography ( $-83\%$ ,  $P < 0.001$ ) (Fig. 1b).

In addition, 58/82 centers (71%) were COVID-dedicated hospitals; of these 34 (59%) of the cardiology divisions were changed into COVID-intermediate care units managed by cardiologists.

In COVID-hospitals, TTE was performed mostly by cardiologists (97%), in association also with anesthesiologists (29%) or intensivists (29%). In most cases, patients had a simultaneous cardiac point of care cardiac ultrasound and lung ultrasound study.

We did not find any differences between no-COVID and COVID-dedicated hospitals in all hospitalizations, and in the hospital admission for ACS, AHF, and arrhythmias difference between study period (2020) and control period (2019) (Fig. 2a). Similarly, we did not have any difference in echocardiographic exam changes in TTE, TEE, and stress echocardiography (Fig. 2b).

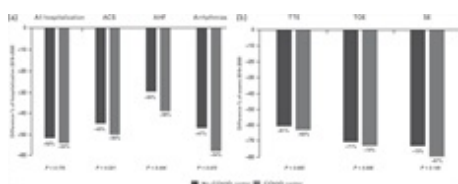


Fig. 2: (a) Difference during national lockdown (10 March 2020–10 April 2020, study period), and corresponding period during 2019 (10 March 2019–10 April 2019, control period) between nocoronavirus disease and coronavirus disease centers in all hospital admissions, and in admission to cardiology divisions for acute coronary syndromes, acute heart failure, and arrhythmias. (b) Difference during national lockdown (10 March 2020–10 April 2020, study period), and corresponding period during 2019 (10 March 2019–10 April 2019, control period) between nocoronavirus disease and

coronavirus disease centers in transthoracic echocardiography, transesophageal echocardiography, and stress echocardiography.

When we considered only the study period (2020), there were no differences between no-COVID and COVID centers in the mean of all hospitalizations ( $54 \pm 40$  vs.  $80 \pm 86$ ,  $P = 0.085$ ), ACS ( $14 \pm 15$  vs.  $23 \pm 20$ ,  $P = 0.102$ ), AHF ( $10 \pm 6$  vs.  $13 \pm 17$ ,  $P = 0.137$ ), and arrhythmia ( $8 \pm 6$  vs.  $10 \pm 10$ ,  $P = 0.411$ ) hospital admissions. Likewise there were no differences in mean TTE ( $137 \pm 108$  vs.  $155 \pm 136$ ,  $P = 0.552$ ), in TEE ( $6 \pm 7$  vs.  $9 \pm 12$ ,  $P = 0.210$ ), and in stress echocardiography ( $4 \pm 9$  vs.  $4 \pm 7$ ,  $P = 0.771$ ).

## Comment

We learned three lessons from this instant survey as follows.

First, the use of lung ultrasound is now embedded in the standard evaluation of known or suspected COVID patients: it allows a fast, accurate, bedside diagnosis of COVID-19 pneumonia without the radiation exposure and logistic discomfort of a chest computerized tomography in the radiology department.<sup>3</sup> Point of care cardiac ultrasound allows early identification of cardiac complications of COVID-19 infection, also for noncardiologists, with reduced consumption of personal protective equipment, and minimizing high-risk sonographer exposure to the virus.

Second, a multidisciplinary approach with cardiologists teamworking with intensivists and internal medicine physicians is mandatory for the optimal care and diagnosis of challenging patients with multiorgan disorders.

Third, we witnessed an unexpected fall in emergency cardiology admissions including acute coronary syndromes as already described worldwide,<sup>3</sup> and an expected reduction in elective imaging activities in outpatients as with all cardiac imaging activities decreasing everywhere by 50–90% during lockdown.<sup>4</sup> These data will help to capture a global picture of the response of different national realities to the organizational and medical challenge of the pandemic.

Many hypotheses might explain this fall. Global measures and public-health messages may have created patient self-censorship, fear of possible in-hospital contamination or a lengthy wait in an overcrowded emergency room. A new interesting hypothesis refers to the cardio-protective upside of the cleaning of air pollution induced by lockdown ‘the best possible result achieved for the worst possible reason’.<sup>5</sup>

## Conflicts of interest

There are no conflicts of interest.

## Appendix

For a list of the individual members of the SIECoVID study group click here [<http://links.lww.com/JCM/A384>].

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## Supplemental Digital Content

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