



# IMPACT OF THE CORONAVIRUS DISEASE-19 PANDEMIC ON ACUTE CARDIOVASCULAR EMERGENCIES IN A THIRD LEVEL CARDIOLOGY HOSPITAL: A CALL FOR ACTION

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## BACKGROUND

The consequences of the coronavirus disease (COVID)-19 pandemic go beyond the number of cases and deaths attributed to severe acute respiratory syndrome (SARS)-coronavirus-2 infection. The overwhelmed health care systems and the strict social containment measures have had an impact on the threshold at which patients seek medical care for diseases other than COVID-19, including cardiovascular conditions. The previous studies have reported a decrease in the rate of hospitalizations for acute coronary syndromes, delay in seeking medical attention, and a decreased number of diagnostic and therapeutic procedures performed after the COVID-19 outbreak<sup>1-3</sup>. Yet, whether the attention for other severe and time-sensitive acute cardiovascular conditions has been affected, which remains ill-defined. The aim of our study was to evaluate the change in emergency department (ED) admissions for nine major acute cardiovascular emergencies after the onset of the COVID-19 pandemic.

## METHODS

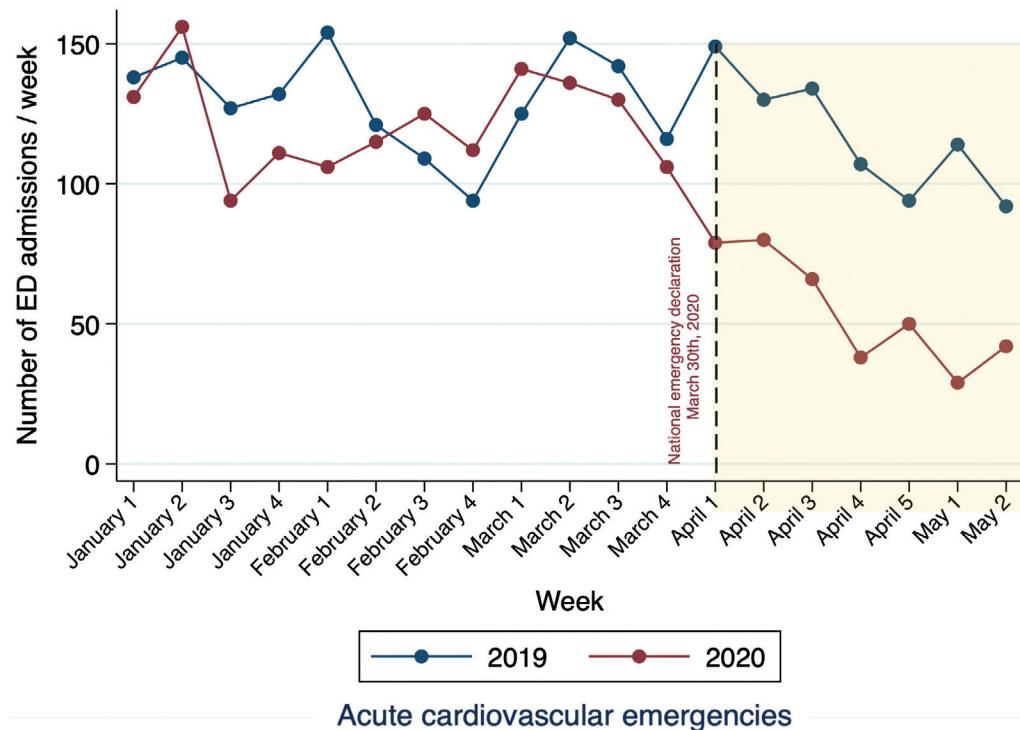
We conducted a retrospective study that included consecutive adult patients aged  $\geq 18$  years old, admitted to the ED of the study center for nine major acute cardiovascular emergencies, including acute pulmonary embolism, acute decompensated heart failure, acute coronary syndromes, tachy- and brady-arrhythmias, hypertensive emergencies, ischemic stroke, acute aortic syndromes, and endocarditis. The study center is a third level cardiovascular hospital that provides medical attention to first comers and referrals from the Mexico City metropolitan area (20.9 million inhabitants). Diagnoses were assessed from patients' medical records and based on pertinent clinical guidelines. ED admissions were aggregated in a weekly manner for the analysis. The pandemic period was defined as the 7-week period after the national COVID-19 emergency declaration in Mexico (March 30<sup>th</sup>-May 16<sup>th</sup>, 2020). Two controls were used: a 12-week pre-pandemic period (January 5<sup>th</sup>-March 29<sup>th</sup>, 2020) and a 2019 historical matched

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Figure 1. Weekly average of admissions for acute cardiovascular emergencies at the emergency department. Dashed line represents the national coronavirus disease-19 emergency declaration. Highlighted in yellow is the study pandemic period.



control 7-week period (March 30<sup>th</sup>-May 16<sup>th</sup>, 2019). The protocol complies with the principles of the Declaration of Helsinki, and the final database supporting the findings of the present study is available from the corresponding author on reasonable request.

## RESULTS

During the 7-week study period, we found a 55% reduction in mean weekly acute cardiovascular emergencies compared with the 12-week period preceding the pandemic (121/week pre-pandemic vs. 55/week pandemic period; difference: 66.0, 95% confidence intervals [CI]: [48.3-85.7],  $p < 0.0001$ ) (Fig. 1). Similarly, we identified a 45.5% reduction when comparing the study period with the matched 2019 historical control (117/week historical control vs. 55/week pandemic period; difference 62.2, 95% CI: [37.9-86.5],  $p < 0.0001$ ). The reduction was observed in all nine diagnoses, ranging from -12% for bradyarrhythmias to -93% for acute endocarditis. These reductions were accompanied by a decrease in the number of patients seen in the outpatient clinic,

in the total number of hospital admissions, and in the occupation of intensive cardiovascular units (Table 1).

## DISCUSSION

Previous infectious outbreaks have been associated with a decrease in the healthcare offer and demand for acute conditions. A retrospective population-based study during the 2003 SARS outbreak showed a 37% decrease reduction in high-acuity visits to EDs in the metropolitan area of Toronto<sup>4</sup>. Another report showed major changes in cardiac care during the outbreak, including a substantial decrease in cardiac catheterizations<sup>5</sup>. Both studies acknowledge that the restrictions in the use of health care services may affect the access for some potentially seriously ill patients.

The present study adds to the medical literature that the care of other cardiovascular emergencies, in addition to acute coronary syndromes, has changed during the COVID-19 pandemic, and the consequences of this phenomenon remain to be seen. Due to the worldwide spread of the COVID-19 pandemic, this



Table 1. Shows relative reductions in outpatient visits, hospitalizations, and cardiovascular ICU occupation

	Historic control, March 30 <sup>th</sup> -May 16 <sup>th</sup> , 2019	Pre-pandemic period, January 5 <sup>th</sup> -March 29 <sup>th</sup> , 2020	Pandemic period, March 30 <sup>th</sup> -May 16 <sup>th</sup> , 2020	Relative reduction, comparing pandemic period with historical control
Outpatient visits, weekly mean of patients	1933	1845	165	-91.5%
Hospitalizations, weekly mean of patients	132	108	45	-65.0%
Cardiovascular ICU occupation, weekly mean percent	112%	107%	73%	-34.9%
COVID-19 ICU occupation, weekly mean percent.	n/a	n/a	98%	n/a

ICU: intensive care unit; n/a: not available (COVID-19 attention at the study centre began on April 1<sup>st</sup>, 2020).

phenomenon is likely to occur in other hospitals, both nationally and internationally, particularly in hospitals that have changed their scope of attention to receive COVID-19 patients. Actions to improve timely access and care of patients with cardiovascular emergencies during the COVID-19 pandemic is urgently needed.

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