

## EDITORIAL

**ST-Elevation Myocardial Infarction and COVID-19: Is There a Synergistic Effect?**Eduardo Martelli Moreira,<sup>1</sup> Bernardo Augusto Rosário,<sup>2</sup> Pedro Felipe Gomes Nicz<sup>1,2</sup>*Universidade de São Paulo, Instituto do Coração,<sup>1</sup> São Paulo, SP – Brazil**Hospital INC,<sup>2</sup> Curitiba – Brazil***Editorial referring to the article: *The Impact of the COVID-19 Pandemic on ST Elevation Myocardial Infarction Care Indicators at a Public Hospital in Brazil***

The SARS-CoV-2 pandemic has widely and profoundly impacted cardiovascular care worldwide. In Brazil, a decrease in emergency department visits for chest pain has been witnessed in both public and private healthcare providers.<sup>1,2</sup> There has been a 23% reduction in weekly emergency department visits for chest pain, from 13.0 to 10.1 per 100.000 habitants, in public health services in Curitiba, Paraná. Private emergency departments have reported an even higher 42% reduction in suspected acute coronary syndrome presentations. A meta-analysis of 12 international studies, conducted with 50,123 patients, has shown a nearly 25% decline, from 11.0 to 8.2, in ST-elevation myocardial infarction (STEMI) daily admissions during the pandemic. Although no increase in symptom onset to first medical contact (patient delay) was reported, there was an increase in door-to-balloon time,<sup>3</sup> and no change in mortality was reported.

In this edition of the International Journal of Cardiovascular Sciences, Vargas et al. report on the impact of the COVID-19 pandemic concerning the reperfusion times of 336 patients who underwent primary angioplasty for STEMI at a single, mid-sized, tertiary center in Passos, Minas Gerais, Brazil. This was a retrospective, before-and-after study carried out between January 1, 2018, and August 31, 2021.

The authors found a 35-minute increase in system delay during the pandemic, from 145 to 178 minutes. No changes were found in total delay (total ischemic time) or in door-to-guidewire times, though it is important to note that precise time measurements were available only

in 157 minutes (46.7%) of the sample. A non-statistically significant increase in in-hospital mortality was present (9.7% pre-pandemic vs 12% pandemic).

The results of this work agree with previously published studies in the sense that it has shown an increase in system delay, but with no clear impact on mortality rates.<sup>3</sup> Nevertheless, previous studies have shown an increase in other important outcomes, such as the presence of left ventricular dysfunction during the lockdown period.<sup>4</sup> Although there was no increase in total ischemic time, it could be argued that system delay is the most reliable measure of the two, as STEMI may be preceded by unstable angina, or the patients may have recall bias. Each hour of system delay is associated with a 10% increase in mortality rates.<sup>5</sup> This relationship was not reproduced in this study, but this could very well be a type 2 error situation.

The authors also report that patients from neighboring municipalities were not as affected as those from Passos itself, at least insofar as system delay is concerned. This is an interesting finding, as one would expect the neighboring municipalities to be more susceptible to disruption in healthcare systems.<sup>4</sup> It may well be that a reduction in STEMI activations reduced the burden on Emergency Medical Services and eased the impact on system delay. Though the incidence of STEMI activation is not reported in the article, it has been documented both nationally and internationally.<sup>2,3</sup> By contrast, this would imply that many patients failed to receive timely treatment, and many ended up dying without having received the proper medical care. In fact, it has been reported that places with many COVID-19 deaths also experienced large increases in cardiovascular deaths.<sup>6</sup>

According to the study data, the pandemic did not affect the door-to-guidewire time. This is a testament to the quality of care in this center. At the time of this

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publication, the nationwide staff shortages, protocol disruptions, and lack of intensive care beds were still within everyone's recent memory, all factors that, while outside the reach of the bedside physician, heavily influence patient outcomes.

Although there were no differences in total and patient delays, it is notable that COVID-19 has brought significant changes in the flow of hospital care to patients. Further studies are needed to assess the real impact of the pandemic in this scenario.

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