

# ST-segment elevation myocardial infarction hospitalisations remain unchanged during COVID-19

## INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic has resulted in hospitals being burdened with large volumes of admissions. However, hospitalisations for myocardial infarction were reported to have reduced throughout Europe and the United States of America (USA).<sup>[1-3]</sup> These authors have hypothesised multiple reasons, including fear of contagion within the hospital due to the lack of personal protective equipment (PPE), avoidance of medical care as a result of social distancing, resource reallocation to manage the COVID-19 pandemic, misdiagnoses, and a true reduction in incidence of acute cardiovascular disease from low physical stress during quarantine, to account for their findings.

Although Singapore has reported more than 55,000 cases of COVID-19, more than 90% of these cases have been reported within the migrant worker population, which is largely segregated from the local population. To determine the impact of the COVID-19 pandemic on hospitalisations for ST-segment elevation myocardial infarction (STEMI) in Singapore, we analysed and quantified data from the multi-centred Singapore Western STEMI network. This registry records the data of all patients residing in the western region of Singapore who presented with STEMI. We compared the incidence of STEMI presentations from 1 February 2020 to 31 May 2020 against that for 1 February 2019 to 31 May 2019. We chose 31 January 2020 as the starting date, as the first local transmission case of COVID-19 was report on that day. The study protocol was approved by the local institutional review board (Domain Specific Review Board-C, National Healthcare Group).

## TRENDS IN INCIDENCE OF STEMI

The incidence of STEMI cases increased from 189 in February to May 2019 to 234 across the same period in 2020 [Figure 1]. Clinical characteristics of the patients [Table 1] were largely similar, with no significant differences between the two time periods in terms of age, median door-to-balloon time, median length of stay and incidence of cardiogenic shock. There was a trend toward increased inpatient mortality noted in 2020, but these small numbers precluded any definitive conclusions to be drawn. Additionally, we examined the local population and migrant worker population separately to address the marked difference in COVID-19 incidence between the groups. The corresponding proportion of STEMI cases among migrant workers increased from 15.3% to 17.5% over the same time period. However, this increase was not significant when

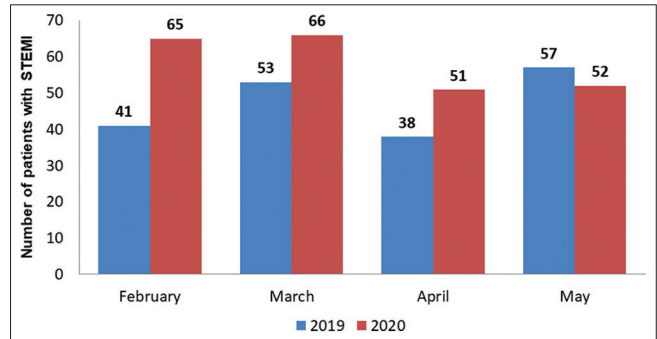


Figure 1: Graph shows the incidence of ST-elevation myocardial infarction (STEMI) across the months of February to May in 2019 and 2020.

Table 1. Clinical characteristics of STEMI cases in 2019 and 2020.

Characteristic	Median (IQR)/No. (%)		P
	2019 (n=189)	2020 (n=234)	
Age (yr)	58 (48-64)	59 (49-70)	0.039
Male gender	172 (91.0)	194 (82.9)	0.015
Door-to-balloon time (min)	52 (40-76)	49 (31-75)	0.629
Anterior STEMI	85 (45.0)	108 (46.2)	0.331
Cardiogenic shock	12 (6.3)	20 (8.5)	0.395
Inpatient mortality	8 (4.2)	22 (9.4)	0.039
Length of stay (day)	4 (3-5)	4 (4-6)	0.152

IQR: interquartile range, STEMI: ST-segment elevation myocardial infarction

compared with the local population (odds ratio 1.17, 95% confidence interval 0.70–1.97;  $P = 0.55$ ).

Our data suggests that there is no true reduction in the incidence of STEMI during the COVID-19 pandemic. We hypothesise several explanations for this discrepancy between our findings and those reported in Europe and the USA. Firstly, learning from our experience with the severe acute respiratory syndrome outbreak in 2003, our early protocols dictated that all STEMI cases were to be treated as COVID-19 suspect cases. All involved personnel from the emergency department to the cardiac catheterisation laboratory would don PPE, and designated routes through the hospital were temporarily barricaded to minimise any exposure. Nosocomial transmission of COVID-19 between healthcare workers has been kept low.<sup>[4]</sup> This has maintained the public’s confidence in the healthcare system and minimised any avoidance of hospital admissions for emergent conditions. Secondly, Singapore has gazetted the majority of the migrant workers and provided continuous access to doctors on-site. This close monitoring has allowed

for early detection of STEMI and reduced any avoidance of hospitalisations. Additionally, the lack of difference in STEMI incidence between migrant workers and the local population (despite the vast majority of COVID-19 cases among the former) is reassuring, given concerns of COVID-19 having a greater impact on the health of marginalised populations.<sup>[5]</sup>

## CONCLUSION

While many countries have reported a reduction in hospitalisations for acute myocardial infarction, we opine that this observed trend is likely due to multiple factors that have led to patient-based anxiety and avoidance of admission, rather than a true reduction in the incidence of STEMI. It will be crucial to monitor this trend further to understand the impact of the COVID-19 pandemic on STEMI hospitalisations worldwide.

## Financial support and sponsorship

Nil.

## Conflicts of interest

Poh KK is a member of the SMJ Editorial Board, and was thus not involved in the peer review of this article.

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Received: 25 Sep 2020 Accepted: 29 Oct 2020 Published: 30 Nov 2020

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	<b>DOI:</b> 10.11622/smedj.2020157

**How to cite this article:** Koo CY, Chan SP, Tung BW, Poh KK, Tan HC, Loh PH. ST-segment elevation myocardial infarction hospitalisations remain unchanged during COVID-19. *Singapore Med J* 2022;63:684-5.