



Opinion Paper

Will the hidden specter of acute coronary syndrome (ACS) and ST-segment elevation myocardial infarction (STEMI) emerge from the avalanche of COVID-19?

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ABSTRACT

There has been a huge impact of the COVID-19 pandemic on global healthcare systems. Advisories across the world have appealed to people to stay at home and observe social distancing to slow down the pandemic. However it is important to realize as to how this is affecting acute cardiovascular care. Recent studies from Europe and USA have reported > 50% reduction in hospital admissions for ACS and declining rates of coronary interventions. The possible reasons for this noticeable reduction in patients with ACS/STEMI during the COVID-19 pandemic are multi-factorial. On one hand, it is due to change in thresholds for referring patients of ACS/STEMI for cardiac catheterization, with fibrinolysis being acceptable for many stable STEMI patients and conservative management being preferred for NSTEMI patients. Theories abound on how “staying at home” strategy may have led to an reduction in acute coronary events due to healthier lifestyle, better compliance and reduced stress. Realistically however, a more disquieting reason would be a “pseudo-reduction” ie. the incidence of ACS/STEMI is actually the same, but these patients are staying away from hospitals due to fear of contracting the infection. Lockdown restrictions have also limited transport options for patients seeking to reach hospitals in time. Healthcare systems need to be prepared for an anticipated downstream deluge of such untreated patients who may present with sequelae like heart failure, reinfarction, arrhythmias, mechanical complications etc. Scientific societies should have proactive campaigns to alleviate patient concerns, and encourage them to seek timely medical attention despite the COVID-19 pandemic.

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The COVID-19 pandemic has put global healthcare systems in turmoil. With governments the world over issuing appeals for people to stay at home to slow down the progression of the pandemic, one needs to focus on how this has affected acute cardiovascular care, especially related to acute coronary syndrome (ACS) and ST-segment elevation myocardial infarction (STEMI).

There has been a marked reduction in hospital admissions for patients with acute coronary syndromes. Data from 71 hospitals in the STEMI care network in Spain revealed a dramatic reduction in diagnostic procedures (-57%), elective percutaneous coronary intervention (PCI: -48%), structural cardiac interventions (-81%) and primary PCI for STEMI (-40%).¹ The reduction in primary PCI was accompanied by a corresponding increase in the use of

thrombolysis. Analysis of STEMI activations for 9 high-volume cardiac catheterization centers in USA also showed a drop of 38% in the first month of the COVID-19 pandemic.²

What could be the possible reasons for this perceptible drop in patients with ACS/STEMI coming to hospitals in the times of the COVID-19 pandemic? While conjectural, the reasons can be categorized broadly under the following categories

1. The COVID-19 pandemic has changed the thresholds and priorities for referring patients of ACS/STEMI for cardiac catheterization. Fibrinolysis is now being considered a reasonable option for the stable STEMI patient and for many NSTEMI patients, conservative therapy is being practiced.^{3,4} Moreover, the deluge of COVID-19 patients has overwhelmed healthcare systems so that many patients with ACS/STEMI are not being comprehensively triaged to cardiology services. As institutions veer away from previously established reperfusion protocols in a bid to

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reduce exposure of cath lab personnel to suspected COVID-19 cases, there has been a sharp decline in the number of coronary revascularization procedures including primary PCI's, as outlined above in studies from Spain and USA.

2. Actual numerical reduction in the number of ACS/STEMI:
 - a. Social distancing and mandatory home stay may have encouraged a healthier lifestyle. Eating home-cooked food (with lack of access to ready-to-order home delivered foods), longer sleep times, lesser pollution (due to traffic restrictions) may all play a role in actually bringing down the rates of occurrence of ACS and MI. People may be smoking less due to the perception that patients with underlying respiratory problems have increased risk of COVID-19 related complications. Increase in family time, closer interaction with loved ones and absence of work related stress, are other psychosocial factors which may play a role in possible lower rates of occurrence of ACS/STEMI.
3. A more plausible and alarming reason would be a so called **“pseudo-reduction”** wherein the incidence of ACS/STEMI is actually the same, but these patients are staying away from hospitals:
 - a. Symptomatic patients are not seeking acute care and staying at home due to fear of going to hospitals. Patients or their attendants may have reservations that hospital environments are unsafe due to the COVID-19 pandemic. Lack of availability of viable transport options, especially given the recent lockdowns across the world may also be contributory. Recent data has shown that time from onset of symptoms to first medical contact increased nearly four times (from ~82 min prior to the COVID-19 pandemic to ~ 318 min at present) in Hong Kong.⁵
 - b. If this is indeed true, it is possible that healthcare services may experience a downstream surge of such patients in the coming times, who may present with sequelae of untreated ACS/STEMI including heart failure, post-MI angina,

reinfarction, arrhythmias, mechanical complications etc. with long evolution times

Scientific societies need to come forward and have active media campaigns to reassure patients and alleviate their concerns, so that they seek timely medical attention if needed, despite the COVID-19 pandemic. At the same time, hospitals need to strategize and optimally direct resources to ensure that these patients are effectively triaged in the emergency and managed well. If this is not done, and symptomatic patients do keep away from hospitals, adverse outcomes with an excess of morbidity and mortality can be expected in these untreated patients. On the other side of the spectrum, whether the rates of ACS/STEMI have truly gone down (due to social distancing, stay at home policy, better lifestyle and patient compliance to medications) should be the subject of planned and meticulous studies in future.

Conflicts of interest

All authors have none to declare.

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