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Case Report

ST-elevation myocardial infarction in patients with Covid-19 – A case series

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1. Introduction

Coronavirus disease 2019 (Covid-19) caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is mainly a respiratory illness but has variable presentation ranging from asymptomatic to multisystem involvement. Very little is known about the nature of how Covid-19 infection causes injury to the heart.1 Although acute ST-elevation myocardial infarction (STEMI) is not a common presentation in these patients, their acute management is challenging.1,2

We hereby described our experience of 9 cases with STEMI in covid-19 positive patients. We aimed to evaluate incidence, clinical presentation, angiographic findings, and clinical outcomes of STEMI in patients with covid-19 at our center. Data were collected retrospectively. All patients with STEMI who were covid-19 positive at any time prior or at the time of infarction were included in the study. Covid-19 was confirmed with reverse transcription–polymerase chain reaction assays (RT-PCR). Diagnosis of STEMI was guideline defined, based on the presence of typical symptoms associated with ST-segment elevation or new left bundle-branch block.3 A stenosis was considered as the culprit lesion in case of angiographic evidence of thrombotic occlusion.

2. Case presentation

Between May 2020 to October 2020, total 686 covid-19 positive patients were admitted and treated at our hospital. Of them, total 9 patients with STEMI were included in this study. Detail demographic, clinical and laboratory profile is described in Table 1. The mean age of patients was 55.44 years. Six (66.66%) patients had no identifiable conventional coronary artery disease (CAD) risk factor while 3 (33.33%) patients had one or more identifiable risk factors. Of these 3 patients with risk factors, one who had history of left coronary artery stenting 1 year back, presented with stent thrombosis. D-dimer and C-reactive protein was elevated in all patients with mean level of 2.91 ng/mL and 18.54 mg/L respectively. Mean troponin-T and creatine phosphokinase-MB (CPKMB) was 31.63 ng/mL and 53.29 unit/L. On high resolution computer tomography chest, the CT-severity score for covid-19 was mild in all except one who had moderate disease. Three (33.33%) patients had ST-segment elevation in anterior precordial leads suggestive of anterior wall myocardial infarction, 5 (55.56%) in inferior leads suggestive of inferior wall infarction, and 1 (11.11%) in inferior and lateral leads suggestive of inferolateral myocardial infarction. On echocardiogram, all patients had regional wall motion abnormalities correlating to electrocardiographic changes.

The three patients (number 1, 2, and 3 in table) were tested positive RT-PCR for COVID-19 during an evaluation for fever, cough and other nonspecific symptoms, who were at home quarantine and on supportive treatment for covid-19. They presented with STEMI on 4, 6 and 7th day from the onset of covid-19 symptoms.
These patients were thrombolysed with Tenecteplase on admission. Post-thrombolysis, two of these patients had persistent chest pain and ST-elevation and underwent rescue percutaneous coronary intervention (PCI) within 8 hours of thrombolysis. Remaining one patient was symptom free and without any regional wall motion abnormality on echocardiogram after thrombolysis, who underwent coronary angiography after 2 weeks (once covid-19 report came to be negative). One patient (number 4 in table) thrombolysed for STEMI at a periphery hospital and subsequently referred came to be negative. All patients were discharged from hospital after covid-19 negative report.

3. Discussion

Viral illnesses have been associated with a number of cardiovascular complications including myocarditis, heart failure, acute myocardial infarction, venous thromboembolism and cardiac arrhythmias. Similar to other viral illnesses like middle east respiratory syndrome coronavirus (MERS-CoV) and in acute respiratory syndrome coronavirus (SARS-CoV) infections, viral illnesses have been associated with a number of cardiovascular complications. Viral illnesses have been associated with a number of cardiovascular complications including myocarditis, heart failure, acute myocardial infarction, venous thromboembolism and cardiac arrhythmias. Similar to other viral illnesses like middle east respiratory syndrome coronavirus (MERS-CoV) and in acute respiratory syndrome coronavirus (SARS-CoV) infections.
this, all our patients either presented in first week of covid-19 symptoms or the STEMI was their initial manifestation of covid-19 infection.

Although the total number of STEMI patients has been decreased during covid-19 pandemic, the management of STEMI in covid-19 patients is really challenging specifically for the choices of initial treatment (thrombolysis Vs PCI) and safety of health professionals. Many experts suggested that a strategy relying on systemic fibrinolysis is not justified, because reperfusion is not required in a significant proportion of patients with covid-19 with STEMI. However, at our institute we did not find any STEMI suspected covid-19 positive patient with normal epicardial coronaries on angiography. We observed a large thrombus burden in all our STEMI patients and the initial thrombolysis was failed in 3 out of 4 patients. This observation also supports the previous reports that thrombolysis is not justified in these patients if the facility of primary PCI is available.

4. Conclusion

Covid –19 positive are at risk of STEMI, particularly in the first week of illness and it can be the first clinical manifestation in them even in the absence of conventional CAD risk factors. The primary-PCI should be the standard of care for STEMI in covid-19 confirmed or probable patients at PCI capable hospitals.

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Ethical considerations

The study was conducted in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its amendments. Informed written consent was taken from the patient concerned. No patient identity particulars have been disclosed.

Contributorship statement

Amitabh poonia and Priya giridhara prepared the manuscript, Vinod sharma and Yogendra kumar arora edited the manuscript. All authors approved the final version.

Declaration of competing interest

The authors declare that they have no Conflict of interest.

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