



COMMENTARY

Covid-19 and the Cardiologist!

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Abstract

While the world is badly hit by this SARS-CoV-2 pandemic, the cardiologists have a special role to play and risks too to bear. Patients with known cardiovascular diseases are at a risk of increased morbidity and mortality by this infection. Also, Covid-19 may present with varied cardiovascular manifestations. This puts the upfront managing cardiologist and his team at greater risk of catching infection. So, they need to find the best possible way to help such patients with minimum possible risk of cross infection. In the midst of genuine and great fear of catching infection in the minds of general population, the number of STEMI visiting the cardiology ER has dramatically fallen. This is posing a great setback to patients who would otherwise have had the mortality advantage primary percutaneous intervention offers. Hope, the cardiologists and their patients sail out of this pandemic safely along with all others too.

Keywords

Covid-19, Cardiologist, STEMI, Hydroxychloroquine, Angiotensin converting enzyme

Abbreviations

STEMI: ST Elevation Myocardial Infarction; NSTEMI: Non ST Elevation Myocardial Infarction; ACE: Angiotensin Converting Enzyme; ARB: Angiotensin Receptor Blocker; PCI: Percutaneous Intervention; ICU: Intensive Care Unit; RNA: Ribonucleic Acid

Introduction

Over the previous few decades, the world is now facing the third zoonotic corona virus pandemic, this time with a novel corona virus SARS-CoV-2. As of April 14, 2020, this Corona virus disease 2019 (Covid-19) has affected more than 1.9 million people over 210 countries globally with more than hundred and twenty thousand deaths. Patients with chronic medical conditions, hyper-

tension, diabetes are suffering the greatest morbidity and mortality when infected by Covid-19. It has been reported to have the highest mortality among patients with cardiovascular diseases [1].

When Covid-19 Mimics Cardiovascular Diseases

Covid-19 is presenting with a multitude of cardiovascular manifestations [2]. Patients may present with left ventricular dysfunction and cardiomyopathy. Whether it is due to myocardial invasion by the virus or cytokine storm induced injury is not known. While in many cases, it presents as Non-ST Segment Elevation Myocardial Infarction (NSTEMI) with non specific ST-T wave changes on electrocardiogram with an elevated troponin levels, it may even present as a ST Segment Elevation Myocardial Infarction (STEMI). There is a case report of Covid-19 induced myopericarditis even in the absence of clinically evident pulmonary involvement [3]. Such a presentation may lead to a delay in diagnosis of Covid-19 and we need to keep a high degree of suspicion. 26% of the Covid-19 patients required cardiologic intensive care in a report on 138 patients hospitalised at Zhongnan University Hospital of Wuhan [4]. Of these, 16.7% developed arrhythmias and 7.2% had acute coronary syndrome.

Managing Covid-19 Positive Patient in Cardiology ICU

For a suspected or Covid positive patient, it is preferable to use systemic thrombolytic therapy for STEMI and activate the catheterisation laboratory for rescue PCI or in patients with cardiogenic shock [5]. In patients in whom we anticipate the need for invasive ventilation

or intra-aortic balloon pump (IABP), such procedures should be done bedside to avoid doing emergently in catheterisation laboratory. As far as cardiac imaging is concerned, it is advisable to minimise the use of echocardiography in a suspected or Covid positive patient. Left ventricular angiogram may be used for left ventricular function assessment. If at all required in view of a new murmur or as an aid in better management, adequate protective gear should be worn by the entire staff. The patient should also wear a face mask and may preferably lie in left lateral position with the operator standing on the right side in order to avoid droplet exposure. Transesophageal echocardiography should be avoided as it generates aerosols. Disinfection of the instruments and catheterisation laboratory is essential after each case. Chlorine containing disinfectants are shown to be effective in clearing the viral load [6].

While there is a need to deliver adequate medical care to Covid-19 patients, it is equally important to minimise exposure of doctors and other healthcare staff to this infection. While we strive to deliver the best medical service at this tough hour too, our fear of getting infected and making our families infected is also genuine. It is not surprising to have a shortage of adequate personal protective kits during such an unforeseen pandemic. This breaks our confidence but we need to reflect being strong as we are a hope for our patients. As the presentation of a Covid-19 infected patient may be similar to that of cardiovascular diseases, there is a higher risk of cross infection. Being cardiologists, usually the first step in examination by habit is to check the pulse. That is fine, but we need to be very careful about hand hygiene and use gloves preferably. Also, the devices like stethoscope need proper decontamination and perhaps lesser use in a suspected or known Covid-19 positive patient. The patients and the attendants should wear mask and keep proper distancing.

It is acceptable to postpone routine follow up visits unless there is some emergency need to visit the hospital. In case of patients visiting hospitals, it should be ensured to maintain adequate distancing between them and avoid crowding. The doctors and the hospital staff should use adequate protective gear to minimise exposure to this virus. There should be minimum staff at a time. This will reduce the risk of catching infection as well as save enough working force to serve to the Covid-19 patients in view of the daily rising numbers. All elective procedure need to be postponed to save resources for the pandemic hit population [5]. We need to postpone PCI for stable coronary artery disease and also the structural and electrophysiology laboratories need to be temporarily withheld. Telemedicine offers a helpful way to reach out to our patients in such challenging times. This helps prevent exposure of other patients and hospital staff to other Covid-19 positive patients. But in developing countries like India, this is very difficult. There is a lack of resources and preparedness to

achieve this effectively.

Treatment Options and Dilemmas

Yet there is no proven therapy for this viral disease, nor does any clinical trial support the role of any prophylactic therapy. In the current scenario, we need strong recommendations to implement infection prevention and supportive management of complications. Although hydroxychloroquine has been tried with limited benefit, we need randomised clinical trials to support this. Hydroxychloroquine is known to prolong QTc interval and this effect may be marked when it is given in combination with other QTc prolonging drugs like azithromycin [7]. We need to be more watchful for this side effect as this may precipitate lethal ventricular tachyarrhythmias, especially in elderly, women, concomitant diuretic use, hypokalemia and hypomagnesemia (Table 1) [8]. A Tisdale score of ≤ 6 predicts low risk, 7-10 medium risk, and ≥ 11 high risk of drug-associated QT prolongation (Table 2). Drugs like ritonavir, lopinavir, oseltamivir, ribavirin have been tried but lack strong evidence [9]. In the absence of clinical trials and conflicting data from *in-vitro* and animal studies, the use of interferons and corticosteroids also cannot be recommended [9]. Remdesivir, a monophosphate prodrug that undergoes metabolism to an active C-adenosine nucleoside triphosphate analogue is emerging as a promising therapy for the treatment of RNA viruses including this novel corona virus [9].

SARS-CoV-2 enters human cells through binding with its spike protein to angiotensin converting enzyme 2 (ACE2) receptors [10]. This has triggered worry regarding the use of ACE inhibitors and ARBs as these drugs upregulate the ACE2 receptors [11] and may lead to more

Table 1: Risk score for drug associated QTc prolongation [9].

Risk factor	Points
Age ≥ 68 y	1
Female sex	1
Loop diuretic	1
Acute myocardial infarction	2
Admission QTc ≥ 450 ms	2
Serum K $+$ ≤ 3.5 mEq/L	2
Sepsis	3
Heart failure	3
One QTc-prolonging drug	3
≥ 2 QTc-prolonging drugs	3
Maximum Risk Score	21

Table 2: Tisdale score and risk of drug-associated QT prolongation [9].

Score	Risk level
≤ 6 points	Low risk
7-10 points	Moderate risk
≥ 11 points	High-risk

deleterious effects. In view of conflicting data and no evidence of harm, it is currently recommended to continue these drugs in patients already taking them [12].

Missing STEMI!

Around the world, the number of acute coronary syndrome patients reaching the emergency room has dramatically fallen. Catheterisation laboratory activation for primary percutaneous coronary intervention of STEMI is reduced by approximately 40% [13,14]. Similarly, the number of patients arriving for other reasons like worsening heart failure has reduced. Perhaps, people are afraid of getting out of their homes and especially visiting a hospital for the fear of catching infection with this corona virus. There are no routine follow up visits anyway due to lockdown, whether imposed by the government or self imposed. When this pandemic shall pass away, may be we will have an increasing number of STEMI who could seek no timely intervention. Lot of them may even face adverse consequences of the same as they are getting deprived of the mortality advantage that primary PCI gives [15].

For a Healthy Future

It's not yet late to recognise that lockdown is making people sedentary. This shall result in a long term boom of cardiovascular adverse effects when we safely sail out of this Corona virus pandemic. Lack of physical activity, no more morning and evening walks, cut down of gymnasium visits and increased daily calorie intake by many might hit the cardiovascular system adversely. This is more worrisome for those with established cardiovascular diseases or risk factors like diabetes. So, we need to stay away from this infection and take care to still have a healthy lifestyle. Let's do physical exercise indoors!

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