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Editorial

COVID 19 pandemic: Its impact on cardiovascular training and care



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Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was first reported in December 2019 in Hubei province, China. World Health Organization (WHO) declared COVID-19 as a global pandemic on March 11, 2020.¹ The ongoing pandemic has infected more than 63 million people worldwide² and more than 13 million people in India,³ which is the second worst affected country, as of November 29th 2020.

COVID-19 pandemic has immensely affected the overall health care system besides its enormous direct impact on morbidity and mortality. Majority of healthcare systems started adopting unprecedented measures to minimise disease transmission and combating the increase of COVID-19 patients. OPD consultations, diagnostic investigations, and non-essential procedures got affected as has been evidenced all across India and the world, with significant reductions in hospitalisations for cardiac illness and procedures. Governments and health care authorities worldwide are recommending the deferral of elective procedures in order to preserve health staff and hospital resources.^{4–8}

Despite the vast improvements in the medical field including improvement in the overall economy and technology, the dismal trend that the COVID-19 pandemic has shown in the 21st century is quite similar to what the world had experienced a century back during the Spanish flu pandemic. A century ago an estimated one third of the world's population (or >500 million persons) were infected, case-fatality rates were >2.5%, and total deaths were estimated at >50 million.^{9–15} Even after 100 years of past experience, the COVID-19 pandemic has devastating effect on entire medical infrastructure of many countries including developed ones.

1. COVID-19 pandemic and cardiovascular training

The COVID-19 pandemic has drastically disrupted the training program of cardio-vascular disease (CVD).^{16–20} Cardiology subspecialty training is usually time-limited so a few months and now even a year without proper procedural experience may have a significant impact on skill development and learning. A survey in New York Metropolitan area has concluded that the COVID-19 pandemic has caused a significant reduction in cardiac catheterization laboratory procedural volumes which has impacting interventional cardiology fellowship training.²¹ Though dedicated study on the impact

of COVID-19 pandemic on the cardiology training programmes in India is limited however impact of COVID-19 on post-graduate orthopaedic training and education was shown to be severely disrupted.²² Significant reductions in cardiac patients coming for treatment, less opportunity to examine variety of cases, less number of bed side classes, less number of cardiac procedures leading to less opportunity to assist and observe different types of cases, and simultaneous reassignment of cardiologist, including fellows to COVID-19-centric services, has ultimately compromised the quality of training. All these have led to educational challenges in cardiology training programs and disruptions to trainee learning. Many of the counties including Indian have adapted flexible and innovative guidelines and mandate for trainees in various disciplines including cardiology, without much compromising the quality education. However this pandemic every day is presenting new unparalleled challenges for medical education. Its impact on medical education can only be realized after the pandemic passes.

All formal and non-formal education have been disrupted during the COVID-19 pandemic. The need for social distancing and avoidance of gatherings has brought about an abrupt end to traditional educational formats. Age old system of examining the patients with the usual methodology of physical examination including measurement of pulse, blood pressure, palpation, percussion, auscultation and integrating the same with a properly taken detailed history to come to a logical conclusion has been significantly affected. COVID-19 infection has played its part in making the time tested practice of clinical cardiology redundant. This has not only affected the patients care but also the cardiology training programmes. With the methodology of clinical examination on a decline and progressively increased emphasis and reliance on investigations like ECG, echocardiography and various other radiological imaging and invasive investigations, many times leads to confusion and errors in judgement of diagnosis and treatment. Laboratory-based learning including echocardiograms, stress tests, and catheterization laboratory procedures have reduced significantly due to cancellation of elective procedures and assignment of trainees to COVID-19 care. Another area which is seriously affected is the research.²³ In person mentorship and real world research are the worst sufferers. Failed experiments, failure to recruit patients for clinical research, patient lost to clinical follow up and protocol violation are some of the inevitable fallouts.

Apart from the compromise in the overall training, psychological impact of the present situation on the trainees is an area unventured, and rather neglected. Drastically altered learning environments, training with scarce opportunities and patient care in various different roles apart from those typical for cardiology, contributed further to the emotional burden faced by the trainees. The prevalence

of depressive symptoms, generalised anxiety disorder and acute stress disorder were significantly high in postgraduate trainees in this pandemic.^{24,25}

2. COVID-19 pandemic and cardiovascular care

Sudden surge in the COVID-19 patients worldwide has crippled the health sector with bottlenecking of the infrastructure. The overflow of the COVID-19 patients in the hospitals (government and private sector alike) due to the initial consensus to admit all COVID-19 patients to hospitals to minimise the chance of transmission has led to significant crunch in the overall availability of the beds. Even with the recent trend of home based management of mild cases, the overall burden of the COVID-19 patients especially moderate to severe cases have over flooded the designated COVID-19 hospitals. This has seriously compromised the management of other non COVID-19 patients. This has been one of the reasons for the overall reduction in admissions of cardiac patients and the decrement in the number of cardiac interventions. A positive phenomenon in this regard may be better environment and less atmospheric pollution because of the lockdown leading to better overall health and fewer ailments.

COVID-19 infection has significantly affected the management of CVDs with impact on all spectrum of CVDs like Acute coronary syndrome (ACS), Stable ischemic heart disease (SIHD), Stroke, Valvular heart disease, electrical disorders, etc. Medical care avoidance behaviour among patients was significantly noted in this pandemic.²⁶ Patients with hypertension, and cardiac diseases were more prone for severe COVID-19 infection. COVID-19 infection also presents with various cardiovascular manifestations like heart failure, ACS and arrhythmias.²⁷ Across the entire spectrum there has been decline in the overall hospitalisations of cardiac patients probably due to reluctance to seek hospital care for fear of infection or contagion. Situation further magnified by the stay-at-home orders, lockdown leading to non-availability of transport facilities, non-availability of beds for non COVID-19 patients and the alerting news from the media, potentially leading patients to delay or defer urgent care.^{28–30} Increased utilization of Telemedicine facilities during the pandemic also contributed to decrease hospital visit. Other possible explanations for overall reduction in admissions could be the higher thresholds for referral to the hospital or emergency department, less intensive care capacity, declines in ambulatory cardiovascular visits, or deferrals of less urgent cases. This could justify the difference, observed in some studies, between the reduction in hospitalizations for ST-elevation myocardial infarction (STEMI) and non ST-elevation myocardial infarction (NSTEMI), as STEMI is usually associated with more severe symptoms. Admissions for acute coronary syndrome (ACS) had decreased significantly by more than one third over three months in India since the lockdown.^{31,32} There was greater reductions in the number of NSTEMI than STEMI. The decrease in the hospitalisations corroborated with the lockdown and the difference in the rates lessened in the second phase of lockdown.³²

Systematic studies regarding the impact of COVID-19 pandemic on the cardiovascular care in India are scarce with a lot of regional heterogeneity and selection bias affecting the data. There has been a total facelift in the management protocol from the pre-pandemic period to the present pandemic era especially evident in our cardiovascular management protocols.^{33–35}

Echocardiography both transthoracic and transesophageal (TEE) are avoided unless they are expected to change patient management. TEE is known to increase the risk of viral transmission due to aerosol generation, and is indicated only if alternative imaging modality does not exist.^{36,37} Exercise stress tests are being avoided. There is higher thresholds exist for elective percutaneous coronary

interventions (PCI), coronary artery bypass surgery, electrophysiology studies, cardiac implantable devices, or structural heart interventions.^{6,38}

Even when patients STEMI reached hospital in time the paucity of resources, and trained manpower do not allow shifting all potential cases of primary percutaneous coronary intervention (PPCI) to cardiac catheterisation laboratory early which has led to a significant decline in the number of PPCI performed by most of the hospitals with progressively increased focus on conservative management including fibrinolytic therapy and the pharmacoinvasive strategy.^{33,39,40} A UK based study showed reductions in the numbers of admissions for all types of ACS, including both STEMI and NSTEMI, but reductions were larger for NSTEMI, a percent reduction of 42%. A differential impact on the PCI procedures across the ACS spectrum with 21% reduction in the number of PCI procedures for STEMI patients vis-a-vis 37% decrease in PCI procedures for NSTEMI patients.⁴¹ There is not only decline in number of acute cardiovascular hospitalizations but patients who were admitted had shorter lengths of stay.^{41–43}

Emphasis on COVID-19 testing to all new patients and delay in emergency evaluation even with life threatening emergency significantly impacts the time scale of management of these condition.³⁹ Management of ACS has been seriously affected. Longer symptom-to-door-times has been demonstrated in patients with STEMI.^{44–48} Some of the developed countries, did not observe any difference in door-to-balloon times pre-versus during-COVID-19.^{47,48} However this should be taken as pinch of salt specially in developing countries where in COVID-19 era the delay is bound to occur. Even Singapore Western STEMI Network program shown that the COVID-19 pandemic had an adverse effect on PPCI service efficiency. Fewer patients in the COVID-19 time achieved door to balloon time <90 min compared with the non COVID-19 time. Prevalence of both out-of-hospital cardiac arrest and acute mitral regurgitation was higher in the COVID-19 time.⁴⁹

Similar to the overall trend across the globe, the utilization rates of various cardiac procedures like coronary angiography (CAG), PCI or CABG also showed a decremental trend in India. Patients of STEMI admitted were less likely to undergo pharmacoinvasive therapy or rescue PCI.³²

Increase incidence of SCD has been reported both in community and hospital settings.^{49–51} Delay in presentation to the hospital after an ACS and deferrals across all tiers of medical facilities may be contributing for increase in the incidence of out of hospital cardiac arrest. Direct causal association of SCD and COVID-19 is still unproven however analysis of the present evidence suggests a plausible association beside other causes.⁵²

The very high rate of infection among the health care workers, including doctors, nurses and para-medics; especially in the designated COVID-19 hospitals is an alarming thing. Mortality among doctors is another important area of concern. Countries with the most reported physician deaths were from Italy 44%, Iran 15%, Philippines 8%, Indonesia 6%, China 6%, Spain 4%, USA 4%, and UK 4%.⁵³ Doctors account for 0.5% of the total deaths in India due to COVID-19. There have been more than 650 reported deaths among doctors in India due to COVID-19 as reported by IMA till 30 November 2020.⁵⁴ Elder age, comorbidities, lack of preparedness against COVID-19, lack of adequate and good quality PPEs in every setup, exposure to higher viral loads could be some of the possible reasons behind the same.⁵⁵ It has been shown that doctors had their fears and perceptions regarding pandemic.⁵⁶ This might also be contributing in impaired cardiovascular care as many doctors are relying on investigations rather than clinical examination. It has been observed that during this pandemic cardiologists are advising more conservative approach rather than aggressive invasive approve in treating patients.

3. Conclusion

COVID-19 pandemic with its widespread impact across the world has affected the entire health care system. Cardiovascular care and the training programs are seriously jeopardized. The burden on the medical fraternity in terms of infection and mortality has been an area of concern. Concerted effort among the Government, different agencies and the medical fraternity is the need of the hour to successfully control and combat the menace of this pandemic. Special efforts by the all the stake holders are required to improve cardiovascular care and to uplift the standard of education and training during these challenging days.

Declaration of competing interest

None declared.

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