I’d love to hear from other societies about how you’re shaking things up, how you’re tackling your most complex problems and the results you’re seeing so far. Email me and let me know, akrahn@mail. ubc.ca

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COVID-19 and cardiovascular disease

In a special report, Mark Nicholls speaks to leading cardiologists from four continents to assess their view of the COVID-19 crisis and its potential impact on the battle against cardiovascular disease

COVID-19 has had a devastating impact on the world’s health systems, economies, and the well-being of populations. With millions of cases and hundreds of thousands of deaths, it has already changed the way we lead our lives.

Yet over and above the direct impact on health, there are concerns of indirect consequences with a rise in cases of cardiovascular disease (CVD), cancer, and other conditions, with indications that patients are delaying seeking medical help and avoiding emergency departments, either because they fear catching coronavirus or, through good intent, because they do not want to become an ‘additional burden’ on an already overburdened health system. In addition, elective surgeries were postponed as hospitals redeployed staff to cope with COVID-19 patients.

In the UK, Accident and Emergency (A&E) departments saw dramatic falls in attendances amid the ongoing coronavirus crisis, caused by the novel SARS-CoV-2. Figures for NHS England showed that total attendances at A&E departments in March 2020 was 1,531,100, a decrease of 29.4% on the same month last year. The British Heart Foundation (BHF), one of the major UK health charities, suggested that the number of people attending emergency departments in England with a heart attack dropped from an average of ~300 a day at the beginning of March to 150 a day by the end of the month.

A study published in the European Heart Journal in May 2020 observed a 48.4% reduction in admissions to Italian cardiac care units (CCUs) for acute myocardial infarction (AMI) during a 1-week period during the COVID-19 outbreak, compared with the equivalent week in 2019.

Even before the pandemic, there were signs that the momentum in the fight against CVD was slowing and, in her opening address to ESC 2019 in Paris, ESC President Barbara Casadei noted that premature death from CVD was ‘starting to edge back up.’

With the ongoing pandemic, senior cardiologists remain concerned that patients are not seeking help at the optimum time and are presenting later with more severe disease, alongside worries that funding for CVD research could now be diverted to COVID-19 research. Against this backdrop, four eminent cardiologists from America, Europe, Africa, and Asia offer their thoughts on the challenges of the COVID-19 crisis and their longer term concerns about the fight against CVD.

Africa

Karen Sliwa is Director of The Hatter Institute for Cardiovascular Research in Africa; a clinical cardiologist at Groote Schuur Hospital, Cape Town, South Africa; and President of the World Heart Federation (WHF).

Professor Sliwa believes a key negative effect of the coronavirus pandemic on the fight against CVD disease globally lies in the fact that many patients either ‘do not seek healthcare early enough due to fear of getting infected with COVID’ or ‘simply can’t easily access healthcare’.

With a strict lockdown in South Africa, many patients struggled to get to hospital in time because of the lack of public transport. ‘I know of a number of my chronic heart failure patients that have passed away as they simply could not make a hospital appointment and get to us’, said Professor Sliwa. ‘We are seeing more patients than usual that had a myocardial infarction and arrived outside of the correct timing for thrombolysis or PCI’.

Professor Sliwa has seen a 50% reduction in patients with cardiac diseases attending clinics, particularly women, often because they had nobody to look after their young children as the older generation was adhering to the lockdown.

She has concerns about people delaying seeking treatment for suspected MI or other cardiac disease. ‘I think we will have more out-of-hospital death due to myocardial infarctions and more patients that end up with ischaemic heart disease presenting in heart failure’, she continued. ‘This will have long-term consequences for the patients, their families, and the healthcare system’.

To help address this, she believes more awareness needs to be raised via radio and television that during lockdown normal clinical services remain functional for people with cardiac symptoms and known cardiac disease.

In her capacity as president of the WHF—the umbrella organization of >200 cardiac societies and foundations with close links to the World Health Organization—she is a principle investigator for a large global registry on COVID and cardiovascular disease (WHF-COVID-CVD). So far, >40 sites in 25 countries have expressed an interest to join, with the aim of having data on 5000
patients admitted to hospitals with a focus on low-to-middle income countries.

She said there still remains much to be learned about this virus, while acknowledging that COVID-19 has had a negative effect on the fight against reducing CVD globally, she suggests there may also be benefits.

‘As people with undiagnosed hypertension and diabetes have an increased risk of severe COVID infection we have a window of opportunity creating awareness for appropriate early diagnosis and management of those conditions. This is a “wake-up call” for all countries with no universal healthcare’.

America

Deepak L. Bhatt, Executive Director of Interventional Cardiovascular Programs, Brigham and Women’s Hospital Heart & Vascular Center, and Professor of Medicine, Harvard Medical School.

‘COVID-19 has been a tragedy on many levels’, said Professor Bhatt, ‘but one is the unfortunate effect on cardiovascular care, and it isn’t just acute care that is suffering—it is also chronic, preventive care’. Patients with acute coronary syndromes and heart failure are avoiding hospital, or delaying seeking medical help, and ultimately presenting ‘in much worse shape’. ‘Patients who have been coming in with cardiovascular admissions have generally been much sicker than usual’, he said. ‘We are seeing mechanical complications of STEMI as in the old days; some trainees have never seen these post-MI problems until the COVID-19 era’.

Another worry is that patients will die at home, and he fears that this is happening already. Mass General Brigham recently published its experience of a decline in cardiovascular hospitalizations during the early phase of COVID-19 in the Journal of the American College of Cardiology.

‘When we see the number of presumed non-COVID-19 deaths, we will then fully appreciate how many patients have died during this pandemic. I predict the number will be staggering’, he added.

Of the long-term impact of the coronavirus pandemic on the fight against CVD, Professor Bhatt said: ‘I think we will see a lot more heart failure from patients who survive these delayed presentations of MI’. While it is important ‘get the word out to patients’ that hospitals are safe to come to if they are sick, a good proportion of outpatient care at Mass Brigham General has been converted to virtual visits using telemedicine.

There is also the potential to revisit how we provide continuing medical education opportunities to physicians, such as via more remote learning.

‘There has also been an almost complete cessation of cardiovascular research, and I fear some of the paused trials will never get restarted. Hopefully, though, we will learn lessons about streamlining clinical research that will be applicable even outside the setting of a pandemic’.

However, he believes the COVID-19 pandemic also provides opportunities, particularly ‘to revamp the healthcare system for the better’.

Professor Bhatt, with Dr Wendy Wang, wrote a piece in the Journal of Invasive Cardiology entitled, ‘COVID-19: an unintended force for medical revolution?’ laying out some of the potential responses to COVID-19 that they believe should be made permanent, such as: telemedicine, less regulation in medicine, more judicious use of resources, and greater global collaboration.

‘We should use this crisis to catalyse overdue positive changes’, he stated.

Asia

Zhi-Cheng Jing is Professor of Medicine and Head of the Department of Cardiology at Peking Union Medical College (PUMC) Hospital, Chinese Academy of Medical Sciences, in Beijing.

He highlighted several reasons behind COVID-19 having a significant negative effect on the fight against reducing CVD/coronary heart disease globally. ‘The regular follow-up of patients with cardiovascular disease in clinic was broken off due to the pandemic’, he said.

As well as CVD patients avoiding hospitals, many doctors and nurses from emergency and cardiology departments have been involved in treating COVID-19 during the pandemic, reducing availability to treat CVD. ‘Seven cardiologists and six nurses from my department went to Wuhan to help the local hospitals battle the epidemic’, he added, ‘and others joined the Fever Clinic team of the PUMC hospital’.

From February to April, his cardiology clinic reduced outpatient appointments because junior clinical fellows and cardiologists were deployed elsewhere, and he is concerned about the post-pandemic knock-on effect of patients delaying seeking treatment for suspected MI. ‘Plenty of patients with acute myocardial infarction will miss out on the optimal time window for reperfusion and revascularization, resulting in a significant increase in the disability and mortality of myocardial infarction. This population will be the big public health challenge after the pandemic’.

Within the hospital, he said the time it took to confirm or exclude COVID-19—and the need to separate patients and medical staff in the catheterization room and CCU from other potential COVID-19 patients—was another factor and meant patients with AMI or pulmonary embolism faced delays in access to treatment. In addition, he noted that infection and inflammation by COVID-19 were important risk factors for thrombosis, AMI, and acute pulmonary embolism, as well as development of heart failure. ‘The most susceptible population attacked by COVID-19 are the elderly population, complicated with hypertension, diabetes and other heart disease, and hypoxia caused by COVID-19, which increased the mortality rate of these patients’, added Professor Jing.

He remains ‘extremely concerned’ that many patients with pulmonary embolism complicated with pulmonary infarction can be misdiagnosed as COVID-19 and are also easily misdiagnosed as NSTEMI due to ECG changes and elevated biomarkers of myocardial necrosis, especially patients with coronary artery stenosis. ‘So, it is very important for the emergency physicians and cardiologists to be trained to improve the ability to diagnose and treat pulmonary embolism during the COVID-19’.
As regards the long-term impact, Professor Jing fears an impact on funding for research in cardiovascular science, and added: ‘With scientific research funds concentrated in the research and development of COVID-19 now, there will be a negative impact on future basic and translational research, public health strategies and new drug discovery for cardiovascular disease’.

**Europe**

Kim Fox is Professor of Clinical Cardiology at the National Heart and Lung Institute, Imperial College London; the Diana, Princess of Wales Chair in Cardiovascular Medicine and Science; and Consultant Cardiologist at the Royal Brompton Hospital, London.

He said that COVID-19 has had a temporary negative effect on the fight against reducing CVD, particularly whilst patients with COVID-19 are being treated in hospitals usually used for the treatment of cardiovascular disease.

‘This is because elective cardiovascular procedures have been cancelled for the time being, though efforts are being made to restart them provided patient safety can be assured’, said Professor Fox, who has also observed patients delaying seeking hospital treatment for fear of catching COVID-19 and that ‘they may die or suffer long term disabilities as a consequence’.

This has been graphically illustrated in the UK, for example, where he said A&E attendances in April for MI were down by 50%. ‘We are aware that cardiology beds that would normally be full are lying empty’, added Professor Fox.

He points to Office of National Statistics data showing that in April 40 000 more deaths were reported than is usual for this time of year in the UK; 30 000 were ascribed to COVID-19 whilst 10 000 were not.

‘Whilst it is not easy to understand how many of these are truly due to non-COVID causes it is quite likely that many are due to cardiovascular disease, presumably myocardial infarction and stroke’. He believes such patients should be encouraged to seek treatment and that health services need to return to normal as soon as it is safe to do so.

In the long term, he believes there will be a negative impact for heart patients.

‘Sadly, many will die unnecessarily, many will be left disabled unnecessarily and even more will be waiting possibly a year on waiting lists for elective surgical and interventional procedures’.

More recently, he said that while attendances at A&E are returning to normal levels and the death rate is falling, routine and elective procedures still have some way to go.

**References**

References are available as supplementary material at *European Heart Journal* online.

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**Changes in the work mode of cardiologists during the COVID-19 epidemic in Wuhan**

Starting in December 2019, some hospitals in Wuhan identified several cases of unexplained pneumonia, which have since been confirmed as acute respiratory infections caused by SARS-CoV-2 infection. Wuhan is an international metropolis with a population of >12 million. Due to the outbreak of COVID-19, the government took the extraordinary step of locking down Wuhan on 23 January 2020, to quickly contain the spread of the epidemic. As COVID-19 became a pandemic, many countries imposed quarantines and travel bans on an unprecedented scale. Nevertheless, the number of cases and deaths continued to rise.

Wuhan was the epicentre in China, with >50 000 confirmed cases. The mortality rate was dynamic because the data were constantly updated. Currently there are no specific antiviral drugs or vaccines available against COVID-19 in humans. Therefore, prevention is the key step to control this pandemic.

**Challenges facing cardiologists**

Cardiologists in Wuhan faced substantial challenges. During the epidemic, the hospitals in Wuhan had been divided into COVID-19-designated hospitals (for the treatment of confirmed COVID-19 patients) and non-designated hospitals (for the treatment of non-COVID-19 patients in critical condition, such as haemodialysis, blood cancers, acute cardiovascular and cerebrovascular diseases, etc.).

First, there was a shortage of medical staff. A significant proportion of cardiologists in non-designated hospitals were allocated to assist other medical units, such as fever clinics, emergency rooms, isolation wards, designated hospitals, and ‘Fangcang’ Shelter hospitals. Unfortunately, some doctors were infected in the early stage, which exacerbated the problem of shortage of medical staff.

Secondly, the medical resources were insufficient. Because COVID-19 is highly contagious and insidious, a large number of patients rushed to the fever clinic, resulting in a serious shortage of beds in the infectious disease department. Meanwhile, medical equipment was insufficient in the early stage, such as ventilators, extracorporeal membrane oxygenation (ECMO) systems, and personal protection equipment (PPE).

Thirdly, there were difficulties in treating cardiovascular emergencies. Cardiovascular emergencies need urgent intervention to save lives. However, almost all the local residents in Wuhan may have had a...