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.1 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.2 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 history of COVID-19 contact. They could not be quickly cleared of suspicion of infection to enable them to receive timely treatment. There is no negative pressure catheterization lab in Wuhan, which made emergency catheterization more difficult.

Finally, patients with chronic cardiovascular diseases such as hypertension, stable coronary heart disease, and chronic heart failure need long-term medication and regular follow-up. Traffic movement was difficult during the lockdown of the city, and the patients were afraid of COVID-19 and so unwilling to go to hospitals. All these factors led to difficulties in the management of chronic cardiovascular diseases.

Changes in the work mode of cardiologists

During this difficult time, the government provided excellent aid to Wuhan. Medical teams from all over the country have successfully supported Wuhan. In addition, with strong support of the government, designated hospitals and ‘Fangcang’ Shelter hospitals were rapidly established. Wuhan also received medical resources from all over the world. Facing so many challenges, the work mode of cardiologists was changed.

First, the management of cardiovascular emergencies changed. The Chinese Society of Cardiology (CSC) issued the ‘CSC expert consensus on the principal of clinical management of patients with severe emergent cardiovascular diseases during the epidemic period of COVID-19’, which identified four core principles during the epidemic: (i) epidemic control as the first priority; (ii) prompt risk assessment; (iii) preference for conservative medical therapy; and (iv) strict measures to limit infection spread within the hospital and to healthcare workers.

According to this consensus, change from interventional therapy to conservative treatment was made. Thrombolytic teams were set up in the cardiology department to treat patients with acute ST-segment elevation myocardial infarction (STEMI) in the emergency room. Patients received thrombolytic therapy before CT lung screening, which reduced myocardial ischaemia time and saved more myocardium.

Secondly, internet-based medical consultations were found to be an efficient means of managing chronic cardiovascular disease. To treat chronic cardiovascular diseases, hospitals used internet-based medical treatment. Online consultations were carried out to provide regular diagnosis and treatment services to patients. Then, online prescription systems were generated so patients could obtain medicine without going to the hospital. Finally, mail services were established to provide patients with drug services which reduced difficult travel and possible cross-infection. In addition, WeChat groups (similar to Facebook social media) were set up for online follow-up and medication guidance. Medical training and guidance to primary doctors were provided.
through various network meetings and videos so that primary medical treatment could be administered smoothly.

Thirdly, cardiologists strengthened their protection and changed to ‘infectious disease doctors’. Rigorous nosocomial infection control training must be completed before starting work. Cardiologists learned how to wear and take off protection suits and disinfect different areas. Because some symptoms of COVID-19 (such as dyspnoea) are similar to those of cardiovascular diseases, it is possible that patients with COVID-19 may go to the cardiology clinic by mistake. Therefore, outpatient cardiologists need to use proper PPE to avoid cross-infection. Because of the long incubation period and the presence of asymptomatic infections of SARS-CoV-2, diagnosis/exclusion takes time. The ‘buffer ward first, regular medical ward thereafter’ mode was established to triage patients in non-designated hospitals. The newly admitted patients who require cardiology inpatient care were admitted to the buffer ward first. Once COVID-19 was excluded, they were transferred to a regular medical ward for further medical treatment.

Finally, the COVID-19 epidemic has promoted multidisciplinary cooperation. In designated hospitals, due to the lack of infectious disease doctors, multidisciplinary doctors, including cardiologists, work together to manage COVID-19 patients. Cardiologists working in non-designated hospitals were frequently invited via web consult to help the multidisciplinary teams in COVID-19-designated hospitals to manage extremely sick COVID-19 patients with multiple organ dysfunction.

During the COVID-19 epidemic, cardiologists in Wuhan faced many difficulties and their work mode changed. In the near future, telemedicine will probably become more popular, especially online diagnosis and treatment, as will multidisciplinary cooperation.

**Conflict of interest:** none declared.

**References**

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