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Editorial

Management of Infective Endocarditis during the COVID-19 pandemic: Experience from an Epicenter in Chengdu, China

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The Covid-19 global pandemic and across 200 countries or regions, there were over 40 million confirmed cases and over 1.1 million deaths worldwide, affecting 189 countries and territories (Figure 1: Johns Hopkins University Coronavirus Resource Center, 2021 https://coronavirus.jhu.edu/map.html). The covid-19 pandemic first reported in Wuhan, China, but through Chinese government's strict control measures, including lockdown the city, restricting individual's travel, strict temperature measurement, and large-scale SARS-COV-2 nucleic acid testing, wear masks, the epidemic was quickly controlled, however, both of which had a substantial effect on the clinical management of some critical emergencies, such as infective endocarditis, because of the following challenges.

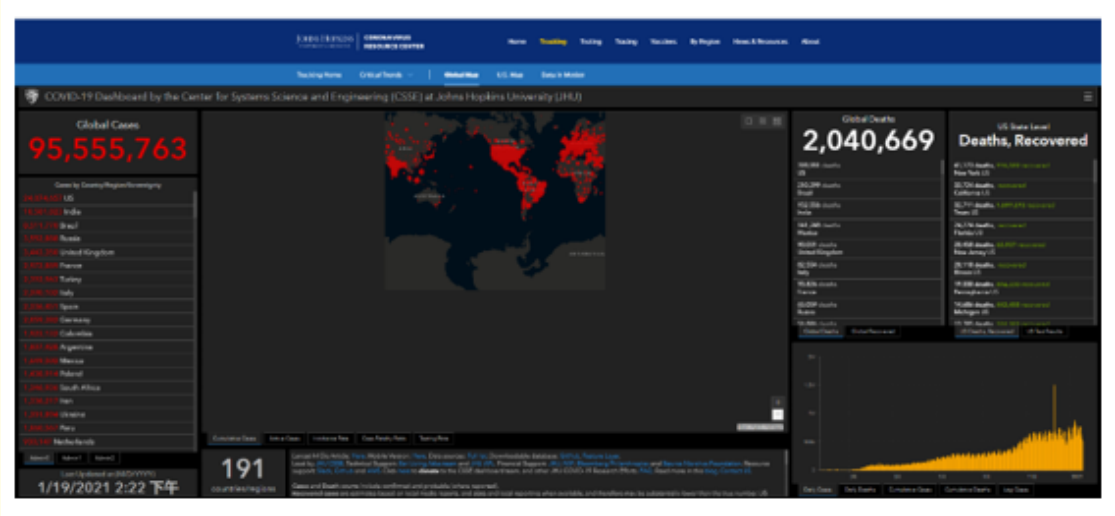

Figure 1: *The Johns Hopkins coronavirus resource center webpage. This webpage "Global Map" was taken from its website: https://coronavirus.jhu.edu/map.html.*

To begin with, it was evaluated that about 81% of confirmed covid-19 cases were asymptomatic, at least initially, and might not even need hospitalization, but it spread very fast [1]. The clinical manifestations of infective endocarditis (IE) can involve multiple organ sys-

tems, and the cardiac manifestations can include valvular vegetation, abscess, periannular extension of infection, and myopericarditis, fever is one of the most common signs of IE patients, in the situation of the covid-19 pandemic, some IE patients who first presented with fever may not be timely diagnosed and receive therapy in time. Therefore, patients with IE could potentially be carriers of SARS-Cov-2 and might cause a spread of nosocomial infections in hospitals. What's more, the prioritized task for controlling the pandemic of Covid-19 had inevitably required most of the local medical resources. Thus, the remaining medical resources for treating other diseases (including IE) were rather limited during the pandemic period. Finally, the community lockdown policy, strict isolation policy for suspected and confirmed cases, testing costs burden, and so on, on the other hand, some patients were afraid to go to hospital for fear of covid-19, as expected, led to a delay in the transfer of IE patients get timely treatment.

In order to help frontline medical workers to better identify IE patients at an early stage, we summarized the characteristics of patients with Covid-19 and IE, as shown in table 1.

Items	Covid-19	IE
Gender	Unclear [3]	Male ⍰female [4]
Age	Elderly, especially with underlying diseases	Elderly
Infectious	Strong	No
Pathogen	SARS-COV-2	Bacterium
Main site of infection	Respiratory system	Cardiac valve
The way of spreading	Respiratory system, mucosa	IVDU [5], cardiac surgery history, Iatrogenic
Isolation	Yes	No
Diagnose	PCR	Echocardiography, blood culture
Suspected patients	History of exposure to the source of infection, symptoms, chest CT	No exposure history, cardiovascular symptoms
Statins	May be beneficial [6]	May be beneficial [7]
Anti-platelet	Depends [8]	Unconventional recommendation [9]
Inflammatory markers	IL-6 increase, lymphocytes decrease, CRP increase	CPR increase

Table 1: *The comparison of covid-19 and IE characteristics.*

IVDU: Intravenous Drug Use; PCR: Polymerase Chain Reaction; CT: Computed Tomography.

In our center, considering the current situation, our team successfully treated about 81 IE patients and performed surgery during the covid-19 pandemic, the IE patients number were similarly to the past years treated in our hospital. In addition, neither the patients nor the healthcare providers contracted Covid-19 infection during the perioperative periods owing to the following strategies:

1. Efficient networks were well preserved, ensuring a timely diagnosis and treatment for patients with IE;
2. If highly suspected, we strived our best to prevent cross infections and nosocomial infections during the patients' entire hospital progress;
3. For patients with previous IE and with early fever after cardiac surgery, we appointed cardiovascular specialists to give care of those patients in special medical locations;

4. Personal protective equipment was mandatory for every member of the cardiovascular medical team and at a critical response level for all emergency operations when necessary;

5. Masks were also provided to all in-hospital patients, people taking care of patients also need to wear masks and test for nucleic acid every 7 days, in principle, frequent change caregivers are not allowed;

6. If the patient's vital signs were stable, preoperative screening of Covid-19 was performed the first after admission; every patient was evaluated for potential Covid-19 infection via both serum antibody testing and CT examination;

7. If the covid-19 infection cannot be ruled out before the emergency operation, they were isolated in a specific ward after the operation;

8. Make full use of the remote medical conditions based 5G internetwork, conduct joint diagnosis and treatment with the community hospital where the patients are located, detect nucleic acid early, and if necessary, the local hospital directly send them to our hospital for the further treatment.

Currently the experience in managing life-threatening surgical emergencies under the Covid-19 pandemic is limited. We hope that our lessons learned from this small series of 81patients can help cardiac surgeons to manage the challenges caused by the epidemic, and meanwhile, we also appeal IE patients to cooperate with Covid-19 screening and take the initiative to go to the hospital for early treatment and avoid serious cardiovascular events.

Competing Interests

No conflict of interests.

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