

Cardiovascular Disease and COVID-19: What's the Issue?

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What's our status?

As per 17 April 2020, Indonesia has the most confirmed cases (5.923 cases) of Coronavirus Disease (COVID-19) among Southeast Asian Countries.¹ Considering the daily increase of cases, we are considered nowhere near the plateau of the epidemic curve. It was predicted that the peak may be reached from May to June.² Predictably, this will not end soon.

COVID-19 contracted patients may also vary in severity. The patient may present with no symptoms, mild to moderate, and severe condition. Mild (81%) depicted as COVID-19 patients with no evidence or mild pneumonia, severe (14%) for COVID-19 patients with hypoxia and >50% lung involvement within 24-48 hours, critical (5%) if the patient develops shock, acute respiratory distress syndrome, myocarditis, or even organ failure which need intensive care, and 2.3 % were fatal which end up in death.^{3,4}

Cardiovascular Disease in COVID-19: Cause or Effect?

Anyone may become infected with COVID-19; however, some people with spe-

cial conditions: people above 60 years old, had pre-existing diseases such as diabetes, heart disease, hypertension, and respiratory disease are at greater risk for developing severe to critical illness when infected with COVID-19.⁵ A well-written meta-analysis study from Emami et al also mentioned the pooled prevalence of several pre-existing diseases which topped by hypertension followed by cardiovascular diseases (16.37%; 12.11%; from 76.993 COVID-19 patients).⁶

Based on the 2018 Basic Health Research (Riset Kesehatan Dasar - Riskesdas), cardiovascular disease is among the highest disease burdens in Indonesia. Both diseases are in fact relatable one to another. By number, 1.5% of Indonesian were suffering from heart disease.^{7,8} If we do the math, we may expect 4.094.128 of Indonesian population (272.941.886 inhabitants) with heart disease at risk for developing severe to critical reactions from COVID-19 infection.

Aside from the pre-existing disease, patients may even develop cardiovascular manifestation from COVID-19 infection such as myocarditis and arrhythmia. Furthermore, the used drugs in COVID-19 patients such as azithromycin and chloroquine may further induce QT prolongation and thus causing Torsades de pointes.⁹ Based on the latest meta-analysis, cardiac injury was proven to

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be associated with higher mortality (RR 7.95; CI 95% 5.12-12.34) and higher need for ICU care (RR 7.94; CI 1.51-41.78%).¹⁰ Proving that cardiac manifestation significantly increases the burden on the healthcare system.

The Issue of ACE-inhibitor Medication and Increased Vulnerability to COVID-19

It was known that COVID-19 virus infects lung cells through angiotensin convertase enzyme 2 (ACE2). Meanwhile, ace-inhibitor (ACEi) or angiotensin receptor blocker (ARB) a regular medication in hypertension and heart failure, are responsible for upregulating the ACE2 receptor.¹¹ Thus, it is widely debated whether the use of ACEi or ARB is considered safe in the midst of COVID-19 pandemic. Some doctors might already panicking and stop ACEi or ARB due to this simplistic pathophysiology of COVID-19 and ACE2 interaction.

However, in COVID-19 patients, ACE2 receptor might be down-regulated because of the COVID-19 infection, thus causing acute lung injury, adverse myocardial remodeling, vasoconstriction, and increase in vascular permeability due to the angiotensin II accumulation and renin-angiotensin-aldosterone system activation.¹¹ Thus, using ACEi or ARB is more beneficial due to its protective effect, this was proven from the lower mortality rate of ACEi/ARB users (3.7% vs 9.8%) in hypertensive patients with COVID-19 infection.^{12,13}

What's the Solution?

Considering the increased fatality in patients with pre-existing cardiovascular disease, it is wise to carefully isolate the patient along with the family living in the same house. Those risky individuals, like the rest of others, may need personal protective equipment such as cloth or surgical masks, but the best effort to avoid getting infected is to stay at home and isolate from others.

Rapid testing, although may have false results, still the best option as for now to get immediate results. Rapid testing should be done whenever someone has the symptoms of fever along with dry cough or had the history of contact with confirmed or suspected COVID-19 patients. The availability of rapid tests has become more affordable in Indonesia, thus making it more accessible for the patients.¹⁴

Last but not least, despite the rumors

of ACEi or ARB use which is said to worsen the condition of patients with COVID-19, the medication should still be continued as stated by the position statement from European Society of Cardiology (ESC) and was proven to be more beneficial to be given from the conducted studies.

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