

How does COVID-19 affect the heart?

March 24 2021, by Liz Ahlberg Touchstone



While many think of COVID-19 as primarily a respiratory disease, its effects on the heart contribute to nearly 40% of deaths – and can strike even healthy children and athletes, says Illinois medical scholar Mariam Bonyadi Camacho. Credit: L. Brian Stauffer

A year into the COVID-19 pandemic, doctors and researchers are beginning to understand how the disease affects patients beyond initial

respiratory symptoms. Mariam Bonyadi Camacho, a student in the medical scholars program at the University of Illinois Urbana-Champaign, co-wrote a recent report on the coronavirus' cardiac effects, both short- and long-term. In an interview with News Bureau biomedical sciences editor Liz Ahlberg Touchstone, Camacho discussed the risks to heart health and possible treatments.

Isn't COVID-19 a respiratory disease? Why would that affect the heart?

When we think about COVID-19, respiratory symptoms and ventilators tend to come to mind. However, symptomatic COVID-19 is a multisystemic illness that produces cardiac manifestations that contribute to about 40% of deaths in hospitalized patients.

The virus that causes COVID-19 can affect the heart both directly and indirectly. It affects the heart directly by infecting heart tissue cells, leading to thickened and injured heart muscle. Indirectly, COVID-19 increases stress and the physiological workload of the heart—for example, pneumonia strains the right side of the heart because the heart muscle works harder to pump against inflamed lung tissue.

Do cardiac effects only manifest in patients who already had heart conditions, or has cardiac injury been documented in previously healthy patients as well?

People with underlying [cardiovascular disease](#), like [high blood pressure](#), are more likely to be hospitalized, admitted to the [intensive care unit](#) and/or have a life-threatening [disease](#) course. However, serious heart manifestations have been observed in young children and seemingly healthy and active athletes, as well. A recent cardiac MRI study of COVID-19-positive athletes found evidence of myocardial injury, even

in those who were asymptomatic. While the implications of this study are still being investigated, it is not clear how this may affect the ability of COVID-positive athletes to safely return to competitive play.

How frequent is cardiac involvement in COVID-19, and what kinds of cardiac problems are seen in COVID-19 patients?

Cardiac involvement is frequent and associated with more severe disease outcomes. COVID-19 has been found to cause myocarditis, cardiac arrest, acute heart failure, irregular heart rhythms and blood clots. In some patients, the heart's ability to fill or pump effectively is weakened. Some patients have shown elevated levels of a protein called troponin, which leaks from heart muscle into the blood when the heart is injured. Patients who exhibit heart abnormalities during their disease course are more likely to have severe symptoms and worse prognosis with COVID-19.

Importantly, when the body fights against COVID-19, it often produces excessive inflammation, injuring bystander organs in the process. COVID-19 is also associated with an increased likelihood to form blood clots in the lungs and heart that can make it harder for oxygen to get to where it needs to go to keep our organs healthy.

What kinds of interventions or treatments may be effective in COVID-19 patients who have underlying heart conditions?

Treatment options for COVID-19 patients with underlying heart conditions are similar to those of the general population, with a focus on preventing viral replication or blocking excessive inflammation from

injuring nearby organs. An antibody that blocks viral attachment is being used to treat patients who test positive for COVID-19 to help prevent severe disease, especially in those with underlying cardiovascular conditions.

For hospitalized patients, health care teams often prescribe remdesivir, a Food and Drug Administration-approved antiviral drug that delays [coronavirus](#) replication. Hospitalized patients may have a reduced likelihood of death when treated with dexamethasone, a drug known for its anti-inflammatory effects. Additionally, drugs that inhibit the actions of cytokines—chemical messengers that promote inflammation—may be beneficial, though more research is required.

Continued adherence to prescribed [heart](#) medications, such as blood pressure medications or blood thinners, also may help improve patient outcomes.

What can people with heart conditions do to decrease their risk of infection or serious disease?

Because a history of cardiovascular disease or risk factors is associated with worse prognosis, taking steps to maintain [heart health](#) by adhering to medication recommendations, staying active and following dietary guidelines may help improve outcomes.

Of course, preventing infection is the most effective method of protecting against COVID-19. While universal face coverings, social distancing and hand-washing may prevent the spread of disease, vaccination will likely be the most effective method of COVID-19 prevention.

Provided by University of Illinois at Urbana-Champaign

Citation: How does COVID-19 affect the heart? (2021, March 24) retrieved 27 April 2024 from <https://medicalxpress.com/news/2021-03-covid-affect-heart.html>

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