COVID-19 and cardiovascular disease – complexities that beckon answers

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As more data on COVID-19 patients become available, the disease appears to be particularly devastating for cardiovascular patients. It goes well beyond the lungs, damaging the heart, brain and other organs. Furthermore, new observations regarding blood clotting also raise questions.

Preliminary data from several European countries demonstrate that a considerable number of people who die from, or are hospitalised with, COVID-19 are patients with pre-existing cardiovascular disease (CVD). Another, rather recent observation, again from several European countries as well as the US, is that a number of patients with COVID-19 have developed blood clots, with a notable increase in young people having a stroke.

Blood clotting

Laboratory blood tests from COVID-19 patients indicate that the blood of patients with severe disease progression becomes thicker (coagulates) much faster than would normally be the case. This can lead to the formation of clots that block important blood vessels, for example in the lungs, heart, brain and other organs. This might explain why some COVID-19 patients suddenly stop breathing (pulmonary embolism) or have a stroke (cerebrovascular embolism).

A retrospective study carried out by the University of Zurich, with data from 338 patients hospitalised in a university clinic in Milan, showed that COVID-19 led to a measurable increase in blood clots causing pulmonary embolism (33%), stroke (2.5%) and heart attacks (1.1%).

In Germany, deep vein thrombosis (a condition of blood clot formation typically in the thigh or lower leg, or other areas of the body) and pulmonary embolism have been observed in a third of COVID-19 patients in intensive care. Similar observations have been made in Sweden and the UK. A Dutch study looking at 184 intensive care unit patients with proven COVID-19 pneumonia identified a 31% incidence of thrombotic complications, of which 9.7% caused strokes. In a recent update of the medical technical information from the Dutch government on COVID-19, life-threatening blood clotting has been included.

Cardiovascular disease: the most common comorbidity in deceased COVID-19 patients

Emerging data from Italy, the Netherlands and the UK show that cardiovascular disease is the most common comorbidity in deceased COVID-19 patients.

A study with data from Italy shows that of 1 596 patients who died from COVID-19, 70% had hypertension, almost 28% had ischemic heart disease, 22% had atrial fibrillation, 15% had heart failure, and close to 11% had had a stroke.

Data from England and Wales show that 14% of 3 912 COVID-19 patients who died had ischaemic heart disease as a pre-existing condition.

In the Netherlands, data show that 43.6% of those who died from COVID-19, and who were aged under 70, had cardiovascular disease as the main pre-existing condition.

These preliminary data are disturbing. More data are urgently needed. It is critical to ensure that high-quality, comparable data from hospitals across Europe, treating COVID-19 patients, are gathered to be able to understand the full picture of COVID-19 and the cardiovascular system. We need to answer questions like how the novel coronavirus affects the heart and the circulatory system; and what is the long-term impact of COVID-19 on those patients.

To that end, the European Heart Network supports the CAPACITY COVID Registry (CAPACITY), led by the Dutch CardioVascular Alliance. CAPACITY registers data on cardiovascular history, diagnostic information, and occurrence of cardiovascular complications in patients with COVID-19. By collecting this information, in a standardised manner, CAPACITY aims to provide more insight into: (i) the vulnerability and clinical course of COVID-19 in patients with underlying cardiovascular disease; (ii) the incidence of cardiovascular disease in patients diagnosed with COVID-19; and (iii) more generally investigate the role of cardiovascular disease in the COVID-19 pandemic. This should lead to providing cardiovascular patients with the best possible care, and to be prepared for future outbreaks.