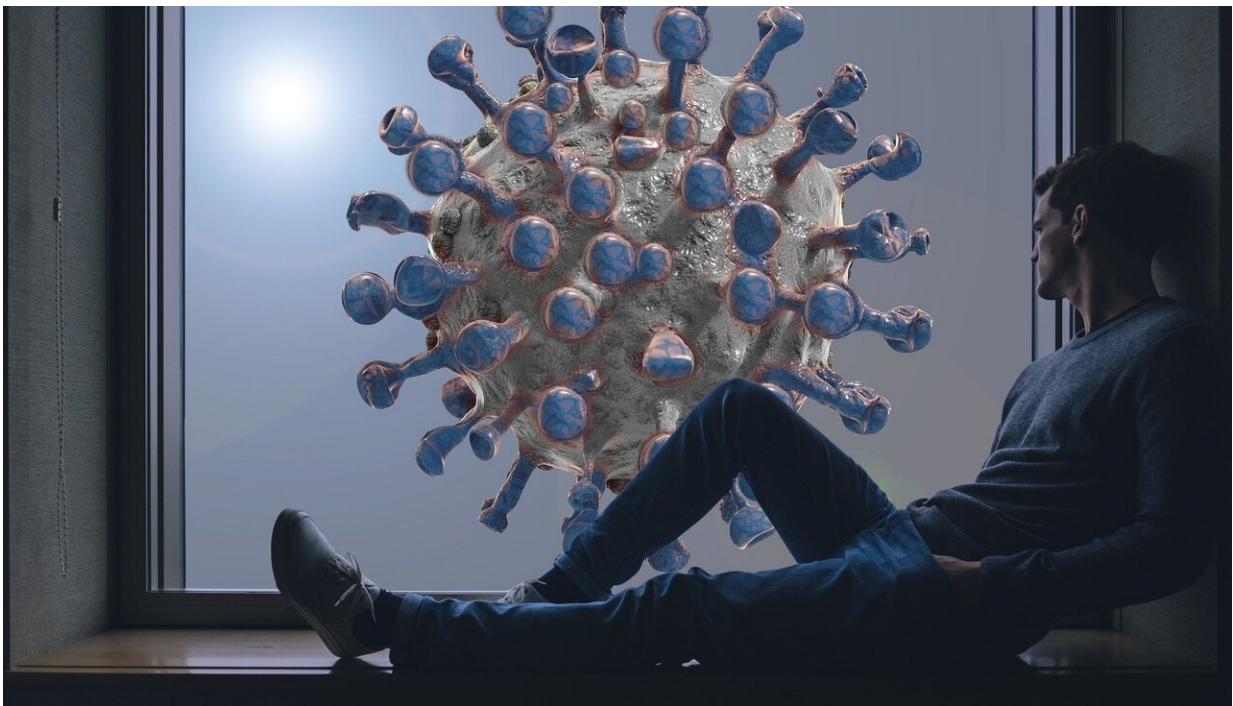


COVID-19 causes pulmonary arterial thrombosis and damages other organs as well as the lungs

May 18 2020, by Mag. Johannes Angerer



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COVID-19, the disease caused by SARS-CoV-2, not only may lead to severe pneumonia but also to thrombosis in the lungs and, subsequently, to multi organ failure involving kidneys, liver and pancreas. These are the findings of a first major series of autopsies in Austria, conducted as

part of a study at the Department of Pathology of the Hospital Graz II, in collaboration with the Johannes Kepler University Linz and the Medical Universities of Graz and Vienna. The study was recently published in the leading journal *Annals of Internal Medicine* and mentioned in their editorial.

According to Sigurd Lax, Professor of Pathology at the Johannes Kepler University Linz and Director of the Department of Pathology of the Hospital Graz II (an academic teaching hospital of the Medical University of Graz) COVID-19 is not purely a respiratory disease affecting the lungs. He conducted autopsies on patients who had died from COVID-19 and, together with his pathology team and colleagues from the Departments of Internal Medicine and Anaesthesiology of Hospital Graz II, microbiologists from the MedUni Graz and Michael Trauner from MedUni Vienna's Department of Medicine III, analyzed the results of the first 11 cases. He says: "Our investigation showed that, although the disease started with lung damage, this was usually followed by [thrombosis](#) in the [pulmonary arteries](#) themselves and damage to other organs in those fatal cases."

Vascular occlusions in the lungs

As in a [heart attack](#) or stroke, thrombosis (occlusion of blood vessels by [blood clots](#)) can directly occlude blood vessels, leading to tissue death (infarction).

Although COVID-19 predominantly causes inflammation of the pulmonary alveoli, the accompanying reaction in the small arteries often seems to trigger blood clotting, which, especially in patients with pre-existing cardiovascular disease, can slow down pulmonary circulation, subsequently resulting in thrombosis in the lung arteries. This results in rapidly progressing respiratory insufficiency and circulatory failure, which is the primary cause of death in COVID-19.

COVID-19 also affects a series of other organs such as the kidneys, liver, pancreas, adrenal glands and lymphatic system. "What we see is that COVID-19 is a serious infectious disease that impacts the whole body and leads in severe course to multi organ failure," explains Michael Trauner. It is not yet clear whether the disease causes long-term damage to the affected organs.

Other reports of COVID-19 patients who have suffered deep vein thrombosis with pulmonary embolism and strokes support the premise that an increased tendency to thrombosis has far-reaching implications in COVID-19.

Still not clear whether anticoagulant therapy is beneficial

The role of anticoagulant drugs in the prevention and treatment of these thromboses is not yet clear, since hospital patients are routinely given blood-thinners as a precaution but these were unable to prevent the thromboses typical of COVID-19, emphasise the intensive care specialists from Hospital Graz II. The study findings support the call from coagulation specialists for need for thrombosis prophylaxis—even for non-hospitalised patients.

Further studies will need to investigate at what point and to what extent [anticoagulant therapy](#) is useful, based on laboratory results and imaging studies. In order to develop new, effective treatments, follow-up studies are required to identify the systemic and local mechanisms in the pulmonary circulation that lead to these thrombotic tendencies.

More information: Sigurd F. Lax et al. Pulmonary Arterial Thrombosis in COVID-19 With Fatal Outcome: Results From a Prospective, Single-Center, Clinicopathologic Case Series, *Annals of Internal Medicine* (2020). [DOI: 10.7326/M20-2566](https://doi.org/10.7326/M20-2566)

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