

Acute limb ischaemia in two young, non-atherosclerotic patients with COVID-19

Coronavirus disease 2019 (COVID-19) was announced a pandemic by WHO on March 11, 2020.¹ As of May 3, 2020, Italy is one of the countries hit hardest by the COVID-19 pandemic, with 28 884 confirmed deaths.² In addition to pulmonary insufficiency, COVID-19 is associated with other life-threatening complications such as sepsis, heart failure, and pulmonary embolism.^{3,4} Here we describe patients with COVID-19 who presented with acute limb ischaemia but did not have atherosclerosis, atrial fibrillation, or pre-existing blood clotting disorders.

Our tertiary care hospital in Parma, Italy, has largely been repurposed to care for patients with COVID-19, reaching more than 800 hospital beds dedicated to patients with COVID-19 at the peak of the pandemic. Within 1 week, we provided care for four patients with COVID-19 with acute limb ischaemia.

Two of these patients had comorbidities (a previous subclavian artery stenting, and a concomitant atrial fibrillation). However, the other two patients with confirmed COVID-19 pneumonia were young and active patients with no comorbidity. At presentation, both patients without comorbidities were receiving low-molecular-weight heparin prophylaxis, and D-dimer concentrations were higher than 9000 ng/mL. One patient, a man aged 53 years who received invasive mechanical ventilation, presented with bilateral lower limb ischaemia secondary to acute aortoiliac thrombosis. He underwent emergent thromboembolectomy through femoral cutdowns, with bilateral pedal pulse recovery. Inspected arteries were free from macroscopic atherosclerotic disease. However,

thrombosis reoccurred approximately 2 h after the thromboembolectomy, and the patient died on post-operative day 2. The other patient, a man aged 37 years, received oxygen support through a nasal cannula and presented with an acute ischaemia of the upper left limb. The clot was visible by duplex ultrasound at the level of the humeral artery bifurcation. After 2 days of unfractionated heparin administration, the acute limb ischaemia resolved.

Changes in blood coagulation during severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection (ie, increased values of D-dimer, fibrin or fibrinogen degradation products, and fibrinogen; decreased antithrombin values, prothrombin time activity, and thrombin time) have been described by Han and colleagues.⁵ Systemic proinflammatory cytokine response is a mediator of atherosclerosis by inducing the expression of procoagulant factors, local inflammation, and haemodynamic alterations.³ Finally, the receptor for SARS-CoV-2 (angiotensin-converting enzyme 2) is expressed on the membrane of vascular muscle and endothelial cells.³

In view of the young and seemingly healthy patients who develop severe vascular complications during SARS-CoV-2 infection, a prospective registry should be established to aid an understanding of the prevalence and risk factors of acute limb ischaemia in patients with COVID-19, with the aim of defining prophylactic and therapeutic protocols.

We declare no competing interests.

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