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Case Report

Thrombotic complication in non-hospitalized COVID-19 patients: An underestimated phenomenon?

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Abstract

Thrombotic complications are quite frequent during severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, especially during severe disease and in hospitalized patients. The incidence of thrombotic complications in mild disease is not clear and probably few cases have been identified. We reported a case of a 60-year-old man with no previous history admitted to our unit for splenic infarct and a floating clot into the descending aorta without signs of severe disease. Several mechanisms to clarify prothrombotic state have been described. However, the exact prevalence of thromboembolic phenomenon is probably underestimated. There is no consensus about the treatment and the indications for preventing these complications in non-hospitalized patients. Thrombotic events should be suspected also in healthy patients with symptoms suggestive for coronavirus disease infection but without severe COVID-19 pneumonia. Further analysis should be performed to stratify the risk in non-hospitalized patients and the indications for prophylactic treatment.

Introduction

The prothrombotic state associated with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection has been widely described in the literature; however it has not resulted in a consensus on the management of complications and the necessity to start a prophylactic treatment.

Different authors have investigated the coagulation system and its dysfunction in coronavirus disease (COVID-19) patients to determine the exact mechanism and find parameters to identify high-risk patients.[1,2] For example, Tang et al reported significantly increased prothrombin time (PT) associated with higher D-dimer levels and fibrin degradation products in non-survivor patients compared to survivor patients.[3]

The clinical presentation is variable, and even in asymptomatic patients, a thrombotic event may occur and play a key-prognostic role.[4] Indeed, 71.4% of mortality in this case met the criteria for DIC and numerous COVID-19 patients' autopsies have shown the presence of pulmonary microthrombi and capillarostasis.[5]

The described case report documents how splenic and aortic thrombosis are possible complications of COVID-19 infection, also in non-hospitalized patients.

Case Report

A 60-year-old man was admitted to our emergency department (ED) with pain in the left hypochondrium, started three days before admission. He reported fever, cough without dyspnoea and diarrhoea ten days before admission for 3 days. He had class I obesity (body mass index: 32.4 kg/m^2), and was non-smoker without significant past medical history. He did not have any familial or other known risk factors for thrombosis, except for obesity.

In ED, the patient was tested for SARS-CoV2 and the result was positive. Laboratory data showed platelet 215 × 10^9/L, PT 69%, international normalized ratio (INR) 1.26, activated partial thromboplastin time (aPTT) 0,82, CRP 16.26, creatinine 1,3 md/dL. Due to the severity of pain in the left upper quadrant, a computed tomography (CT) from chest/abdomen/pelvis with contrast was carried out. The chest-CT did not show any ground glass opacity, subsegmental areas of consolidation or typical COVID-19 related pneumonia. However, the images of the abdomen revealed an infarction of two-thirds of the spleen, a thrombus in the splenic artery, splenic vein thrombosis and a floating clot into the descending aorta (Figure 1). The pulses in upper and lower extremities were palpable but were checked with Doppler ultrasound which did not show any further thrombosis. Anticoagulant therapy with 8000 UI low molecular weight heparin (LMWH) twice a day was started for the patient.

A follow-up CT after seven days of therapy revealed

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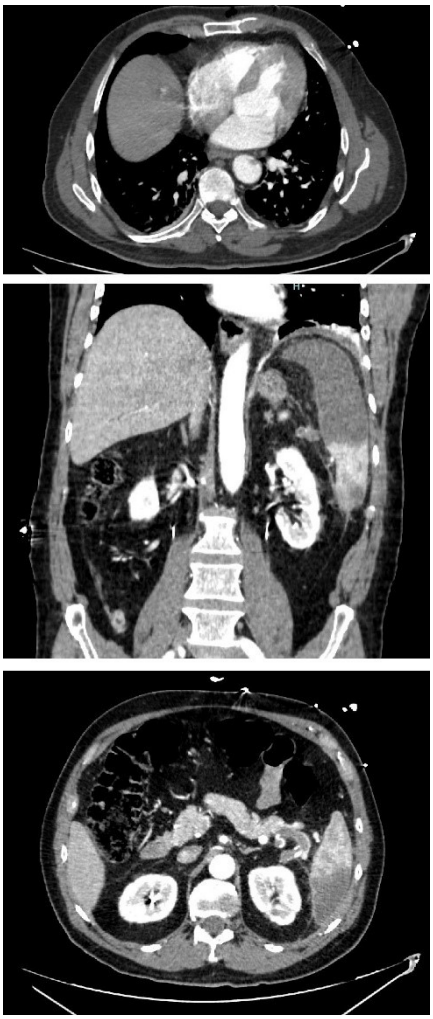

Figure 1. The CT scan in arterial phase shows the spleen infarction and the thrombus in the splenic artery

the resolution of all blood clots were only persistentin the spleen. On day 10, the patient was discharged on warfarin.

Discussion

Previous publications have reported cardiovascular and thrombotic complications associated with SARS-CoV-2 infection.[6,7] Several mechanisms have been proposed to explain the elevated thromboembolism risk of COVID-19 and one of the most interesting mechanisms, is the immunothrombosis model of COVID-19 proposed by Henry et al.[8] According to this theory, the interaction between the virus and the angiotensin-2 receptor and the subsequent alteration of the renin-angiotensin-aldosterone system can lead to endothelial dysfunction that determines a prothrombotic status.[8] Indeed, the endothelial injury and the generated inflammatory cascade, in association with additional risk factors (hypoxia, immobilisation, platelet hyper-reactivity and complement activation) may lead to venous and/or arterial thrombus.[8,9]

While pulmonary embolism has been one of the most described thromboembolic complications of COVID-19, the incidence of splenic infarct is undoubtedly underrated. As a matter of fact, abdominal imaging is not routinely performed, and case reports are scarce in the literature. Generally speaking, the exact prevalence of thromboembolic phenomenon is probably underestimated. Indeed, most of the latest studies are focused on hospitalized patients, but there is a lack of data about thrombotic events in non-hospitalized and asymptomatic patients. A recent study has estimated that about 18% of COVID-19 patients treated at home have a CT positive for pulmonary embolism. The risk was higher in elderly with higher D-dimer levels, regardless of the severity of pulmonary involvement.[10] Moreover, few case reports described fatal pulmonary arterial thrombosis in asymptomatic COVID-19 patients after swab negativization.[11]

These papers have raised concern about possible thrombotic complications even in asymptomatic patients or patients with mild disease who are usually treated at home.

The International Society on thrombosis and haemostasis recommends considering prophylactic dose of LMWH in all hospitalized patients in the absence of any contraindications.[12] However, there is no agreement about the prophylactic use of anticoagulants and antiplatelet therapy to prevent venous thromboembolism (VTE) or arterial thrombosis in non-hospitalized patients. A sepsis-induced coagulopathy score has been created to evaluate the risk of thrombosis in patients. However, people non-hospitalized patients have not been taken into consideration. The current guidelines (NIH guidelines) do not recommend the measurement of coagulation markers (e.g., D-dimers, PT, platelet count, fibrinogen) and the use of anticoagulants and antiplatelet therapy in non-hospitalized patients.[13]

Conclusion

The majority of available papers report data about thrombotic events in severely ill patients, but there is a lack of knowledge about its incidence in symptomatic patients with mild disease and non-hospitalized patients. This case report demonstrates that even in healthy patients without severe pulmonary involvement is possible to have life-threatening thrombotic complications and clinicians should maintain a low threshold to suspect VTE or embolic events. Further scientific evidence will be necessary to clarify the necessity to start a prophylactic antithrombotic therapy with LMWH in all COVID-19 patients, even if asymptomatic.

Authors' Contribution

All authors contributed to the final manuscript.

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Ethical Approval

No ethical committee approval required. The patient gave his

informed consent for the publication of case report and image.

Conflict of Interest

Authors declare no conflict of interest in this study.

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