COVID-19 with essential thrombocythemia treated with apixaban for antithrombotic prophylaxis

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SUMMARY

A 40-year-old man was admitted to our hospital for COVID-19. He had been treated for essential thrombocythemia (ET). He was diagnosed severe illness of COVID-19, oxygen therapy and dexamethasone were administered. There was a possibility of thromboembolic events in this case, apixaban for prophylaxis was added. With these treatments, the patient has made a good recovery, and he was discharged on hospital day 11. There is no standard strategy for prophylaxis of thrombosis in patients with ET, and apixaban could be a clinical benefit for these patients.

BACKGROUND

Since December 2019, SARS-CoV-2 has emerged in China, and spread worldwide rapidly, posing serious challenges to medical care system.[1] COVID-19 is characterised by the occurrence of venous thromboembolism (VTE) and/or arterial thrombosis, which could lead to severe morbidity and mortality.[2] Moreover, patients with myeloproliferative neoplasms (MPNs), including essential thrombocythemia (ET), polycythemia vera and myelofibrosis, are reported to be prone to develop thrombotic complications.[3] There are few reports of COVID-19 cases complicated with MPNs, and further researches are required to establish the treatment strategy in patients with MPNs. Our case describes a patient, who had been treated for ET, treated with supplemental oxygen, dexamethasone and apixaban for prophylaxis of thrombosis. This article could highlight the clinical benefit of prophylaxis and antithrombotic therapy in cases with ET.

CASE PRESENTATION

The patient is a 40-year-old man with a medical history significant for ET, who had been treated with hydroxycarbamide and aspirin. International Prognostic Score for Thrombosis in Essential Thrombocythemia (IPSET-thrombosis) score was intermediate, and International Working Group-Myeloproliferative neoplasms Research and Treatment (IWG-MRT) score was 0 (low risk). He complained fever, dry cough, malaise and arthralgia. A nasopharyngeal swab for SARS-CoV-2 test was done, being positive. On the ninth day of isolation, his symptoms did not improve, and he was admitted to our hospital.

On admission, he was alert. Temperature was 37.5°C, pulse 83 bpm, blood pressure 123/69 mm Hg, respiratory rate 23 times/min and pulse oximeter 90% saturation without supplemental oxygen.

INVESTIGATIONS

Laboratory tests showed white blood cell count 2.37×10^9/L (normal: 4.0–9.0) (85.7% neutrophils, 12.2% lymphocytes), red blood cell count 4.28×10^{12}/L (normal: 4.27–5.70), haemoglobin 144 g/L (normal: 130–180), haematocrit 43.0% (normal: 40.0–52.0), platelet 119×10^9/L (normal: 150–350), lactate dehydrogenase 359 IU/L (normal: 124–222), fibrinogen 562 mg/L (normal: 170–370), d-dimer 0.6 µg/mL (normal: 0.0–1.0), C-reactive protein 7.27 mg/dL (normal: 0.10>), creatine kinase 143 IU/L (normal: 60–290). The liver and kidney functions were within normal values.

Contrast-enhanced CT revealed multilobar ground glass opacities with a posterior predominance in both lungs (figure 1).

TREATMENT

After admission, he was diagnosed severe illness of COVID-19,[4] and he received treatment of oxygen therapy with a nasal cannula, oral dexamethasone (at a dose of 6 mg once a day) and apixaban (at a dose of 5 mg twice a day) for prophylaxis of thrombosis. He also continued treatment of hydroxycarbamide and aspirin.

OUTCOME AND FOLLOW-UP

His symptoms have improved and oxygen saturation level has become normal without supplemental oxygen on hospital day 8. There was no bleeding complication during hospitalisation. He was discharged on hospital day 11. Apixaban was stopped after discharge, but hydroxycarbamide and aspirin were continued. The post-hospitalisation course has been uneventful 60 days after discharge.

DISCUSSION

COVID-19 disease primarily affects the lungs, but it could cause complex multiorgan effects.[1] Previous reports showed thrombosis complicated with COVID-19 infection.[2 5] The incidence of thromboembolic events is 7.9% in hospitalised patients with

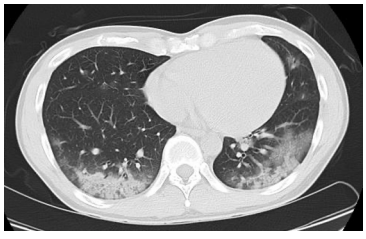

Figure 1 Contrast-enhanced CT showed multilobar ground grass opacities in both lungs.

COVID-19 in general wards,[5] but the incidence of thrombosis is lower in Japan (1.86% of all hospitalised patients with COVID-19).[5] Of the thromboses, deep vein thrombosis and pulmonary thromboembolism are the most frequent, but symptomatic cerebral infarction is also frequent entity.[2 5]

In addition to high incidence of thrombosis in patients with COVID-19, patients with MPNs are thought to be vulnerable to these events. Patients with MPNs suffer from a 2–4-fold higher incidence of arterial and venous thrombosis than the general population.[3 6 7] Moreover, there is a study reporting that ET is associated with the risk of VTE among patients with MPNs,[3] and that the association between ET and thrombosis was regardless of inflammation indicators and the severity of COVID-19.[3] To detect thromboses early, d-dimer level is reported to be a clinical biomarker predicting thrombosis,[8] and in patients with ET complicated with venous thrombosis, d-dimer values were reported to be significantly higher than the ones without thrombosis.[3] The platelet count is reported to be significantly lower during the acute phase of infection than the valued collected in the latest follow-up, and which might indicate a platelet consumption due to low grade disseminated coagulation by systemic endothelial vascular cell damage, leading to arterial or venous thrombosis.[3] Our case showed normal value of d-dimer but lower platelet count than the last follow-up, and the case was diagnosed severe illness of COVID-19, which could not deny the possibility of thrombosis.

However, there is no standard prophylaxis and antithrombotic therapy in patients with ET complicated with COVID-19, because the prevalence of MPNs is low and there are few reports. There is only one retrospective study of patients with MPNs complicated with COVID-19,[3] and most cases received low molecular weight heparin (LMWH) as antithrombotic prophylaxis. But there is a problem of bleeding in the treatment of heparin, 4.3% of patients receiving LMWH showed major bleeding.[3] There is another report that showed clinical benefit of apixaban for antithrombotic prophylaxis in patients with COVID-19, resulting in decreased mortality without increasing the risk of bleeding.[9] In our case, apixaban was administered for antithrombotic prophylaxis, and there were no symptoms suggesting thrombosis, and there was no bleeding. Therefore, we speculate that apixaban could be useful and safe antithrombotic prophylaxis for patients with ET complicated with COVID-19. The number of reports showing the association of COVID-19 and ET is very small, so further investigations are required to establish the safe and effective management strategy.

Learning points

- Essential thrombocythemia (ET) could cause thrombosis complicated with COVID-19. The clinicians should consider the possibility of thromboembolic events.
- There are no standard strategies for thromboembolic events associated with COVID-19, especially in patients with ET. Apixaban could be of clinical benefit in prophylaxis for thrombosis in patients with ET.

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