

Inferior Mesenteric Vein Thrombosis in SARS-CoV2 Infection: A Case Report

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ABSTRACT

The Novel coronavirus (COVID-19) infection, First Discovered in Wuhan, China November 2019, That become a worldwide pandemic. CoV-2 infection generates a pro-inflammatory state, which conditions the formation of thrombi that can affect any system. Multi-organ dysfunction is a cause of death, mesenteric ischemia in COVID 2019 patients reported is 1.9-4%. We present the case of a 46-year-old male patient who had SARS-CoV-2 infection with symptoms of abdominal pain, fever and loose motion and later developed an inferior mesenteric vein thrombosis as a complication. The coagulation indicators D-Dimer and prothrombin were found to be deranged, that was further correlated with CT imaging. It is essential to report and understand the relevance of Covid-19 positive cases that present with gastrointestinal symptoms and blood thrombosis. As coagulation dysfunction is associated with survival, the introduction of D-Dimer and Prothrombin test in routine laboratory investigations of Covid infection would help to predict the mortality of patients and in accordance start early intervention to manage further progression of the disease.

Keywords: COVID-19, Inferior mesenteric vein thrombosis, SARS CoV-2 induced thrombosis

INTRODUCTION

Coronavirus is caused by Severe Acute Respiratory Syndrome Virus, Till May 2022 there have been over 513 million confirmed cases worldwide¹. mode of transmission can be by two methods droplet (person-to-person) or airborne transmission², in the beginning most recognized features are of respiratory symptoms accompanying with fever and cough. Most of the times patients with these symptoms were diagnosed as pneumonia of unknown etiology³ as covid-19 cases were increasing hypercoagulable complications were documented more and started to be considered as one of the main complications of covid-19 infection.

Multiple mechanisms play in the role of increasing the risk of thromboembolism in Covid patients firstly, an increase in the pro-inflammatory cytokines in particular IL-1B, IL-6 and TNF in patients with Covid-19 which in turn causes an increase in the thrombin production and decrease in endogenous anticoagulant⁴.

Next, the hyperinflammatory state leads to endothelial cell damage and fibrin deposition in the capillaries causing microthrombosis⁵.

Further, SARS 2 targets Angiotensin converting enzyme leading to increase in angiotensin 2 which triggers to increase in inflammation, vasoconstriction and fibrotic organ damage. As a results, the severity of the disease increases significantly by developing other complications⁶.

One of the main factors that indicates the severity of the disease are the values of D-Dimer and Prothrombin time, it was found that patient who were admitted in ICU had an increase in D-Dimer and decrease prothrombin time than those who were admitted in non-ICU setting⁷.

As an initiative from BDF hospital covid screening clinic was established in March 2020 to serve local people and allow early detection of the disease and management.

Patients who meet the criteria for covid screening are seen in the clinic

and assessed, critical patients are forwarded to the emergency room and stable patients are seen in the clinic and subjected to home isolation pathway.

From March 2020 until May 2022, a number of 145,252 covid PCR tests were done and 8655 were positive for covid 19 (5.9%) and this was the only case that had inferior mesenteric vein thrombosis as a complication.

CASE PRESENTATION

A 46 years old male, known case of hypertension (controlled) and smoker, tested positive for Covid-19 on 1st of July,2020 with CT value of-25, Patient symptoms were low grade fever reaching maximum (38c) and intermittent mild abdominal pain associated with loose motion, Patient was stable so he was subjected to home isolation pathway, on Day 6 of home isolation he had spike of fever reaching (39.6c) associated with severe lower abdominal pain radiating to left iliac fossa and constipation so patient was transferred to a hospital for assessment.

On assessment patient vitals were stable, afebrile with oxygen saturation 98% on room air, on examination chest was clear, good air entry bilaterally, in the abdomen, there was suprapubic tenderness.

Patient was admitted for further assessment his blood investigations are shown in table 1 which represents increased inflammatory Markers and D-Dimer

WBC	13.32 x10 ⁹ /L
Hb	14.2 g/dL
PLT	324 x10 ⁹ /L
Neutrophils	77.4 %
Lymphocytes	11%

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D-Dimer	2.26 mg/L
Procalcitonin	1.8 µg/L
CRP	238 mg/L
Creatinine	78 µmol/L
Urea	4.1mmol/L

Patient was initially kept NPO and on IV hydration, started on Rocephin, Abdominal Ultrasound done showed no abnormality Then Patient started to be disoriented and confused so CT brain was done which showed no acute insults, Lumbar puncture was done as well and showed no abnormality

Patient inflammatory markers WBC count as well as D-Dimer were found to be increased as compared to the previous investigations (Table 2)

WBC	23.04 x10 ⁹ /L
Hb	15.3 g/dL
PLT	265 x10 ⁹ /L
Neutrophils	90.7 %
Lymphocytes	5.2 %
D-Dimer	10 mg/L
Procalcitonin	12.2 µg/L
CRP	198 mg/L
Creatinine	144 µmol/L
Urea	7.8 mmol/L

Computed tomography (CT) of abdomen with IV contrast was done which showed thrombosis of the inferior mesenteric vein along its whole course, significant colonic diverticulosis is seen with significant fat stranding and multiple enlarged lymph nodes likely reactive. No diverticular abscess.

Antibiotic was changed to meropenem and metronidazole, patient was followed by surgical and haematology team initially kept on therapeutic clexane then changed to dabigatran on day of discharge and advice to continue it for 6 months.

Patient stayed in the hospital for a total of 9 days, his condition improved and discharged home in stable condition.

DISCUSSION

Covid-19 was initially thought as a respiratory virus but as the disease was understood more its effect on other body systems are documented along with its coagulopathy.

Covid-19 disease has an unpredictable course what initially be classified as mild disease can exacerbate to severe covid disease, so continuous monitoring is important as well as patient education, and instruction when to call an ambulance.

Mesenteric thrombosis is a serious medical emergency so low threshold for diagnosis should be kept in the physician's mind with patient presenting with vomiting, diarrhoea and abdominal pain, Moreover, it was reported that it happens more in males and hypertension was the most common co-morbidity⁸. Blood investigation is an important initial step in diagnosing a patient but it has low specificity, an increase in inflammatory markers such as high C-reactive protein, Procalcitonin and IL-6 and Increase in D-Dimer, Lactate dehydrogenase and decrease

in Prothrombin time can indicate a severe covid disease⁹. Imaging is the best tool to Diagnose Acute mesenteric ischemia, Contrast-enhanced Abdominal CT is the gold standard investigation¹⁰, and it should not be delayed as diagnosis and treatment in timely manner is essential for the patient survival.

Multiple studies showed that Covid vaccine is significantly effective in reducing the severity of covid disease, preventing hospitalization, reducing the length of hospital stay, ICU admission and death^{11,12}. Further studies are required for the role of vaccination on thromboembolic complication of covid-19.

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REFERENCES

1. World Health Organization. Weekly epidemiological update-15 May 2022. [cited 20 May 2022]. Available from: Weekly epidemiological update on COVID-19 - 18 May 2022 (who.int)
2. WHO. Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations. World Health Organization 2020.
3. Li Q, Guan X, Wu P, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *N Engl J Med* 2020;382(13):1199-207.
4. Henry BM, de Oliveira MHS, Benoit S, et al. Hematologic, biochemical and immune biomarker abnormalities associated with severe illness and mortality in coronavirus disease 2019 (COVID-19): a meta-analysis. *Clin Chem Lab Med* 2020;58(7):1021-8.
5. Schulman S. COVID-19, prothrombotic factors and venous thromboembolism. *Semin Thromb Hemost* 2020;46(7):772-6.
6. Henry BM, Vikse J. Clinical Characteristics of Covid-19 in China. *N Engl J Med* 2021;19(3):141-54.
7. Klok FA, Kruip MJHA, van der Meer NJM, et al. Incidence of thrombotic complications in critically ill ICU patients with COVID-19. *Thromb Res* 2020;191:145-7.
8. Kerawala AA, Das B, Solangi A. Mesenteric ischemia in COVID-19 patients: A review of current literature. *World J Clin Case* 2021;9(18):4700-8.
9. Al Mahruqi G, Stephen E, Abdelhedy I, et al. Our early experience with mesenteric ischemia in COVID-19 positive patients. *Ann Vasc Surg* 2021;73:129-32.
10. Gupta A, Sharma O, Srikanth K, et al. Review of Mesenteric Ischemia in COVID-19 Patients. *Indian J Surg* 2022;1-9.
11. Liu Q, Qin C, Liu M, et al. Effectiveness and safety of SARS-CoV-2 vaccine in real-world studies: a systematic review and meta-analysis. *Infect Dis Poverty* 2021;10(1):132.
12. Huang YZ, Kuan CC. Vaccination to reduce severe COVID-19 and mortality in COVID-19 patients: a systematic review and meta-analysis. *Eur Rev Med Pharmacol Sci* 2022;26(5):1770-6.