

Original Research Article

Mesenteric ischemia and COVID-19: an observational study in a tertiary care centre in Bangalore

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ABSTRACT

Background: Acute mesenteric ischemia is a rare abdominal emergency and is associated with high rates of morbidity and mortality. COVID-19 infection has also been described to predispose to venous and arterial thromboembolism. The mortality rate of AMI in COVID-19 is still unknown, yet it is likely to contribute significantly to an increased burden of disease. Aim and objective were to determine the occurrence of mesenteric ischemia in patients with history of COVID-19 infection in a tertiary health care centre in Bangalore.

Methods: This is a retrospective observational study conducted in the department of general surgery in Bangalore medical college and research institute, Bangalore over a period of 3 months from October 2021 to December 2021. A total of 15 patients who presented to the emergency department and was diagnosed to have mesenteric ischemia were included in the study.

Results: Total of 15 patients were included in the study. Mean age of the patients was 41.86 years. 5 patients had history of being tested positive for COVID-19 and another 3 of the patients had history of being symptomatic or coming in contact with a COVID-19 patient but was not tested.

Conclusions: Knowledge of occurrence of mesenteric vessel thrombosis in patients with history of COVID-19 infection is essential for the health care workers and the patients and their attenders for timely consultation, diagnosis and management.

Keywords: Mesenteric ischemia, COVID-19, Bowel gangrene

INTRODUCTION

Acute mesenteric ischemia is one of the important abdominal emergencies and it is usually associated with high rates of morbidity and mortality. Early diagnosis requires a high index of suspicion. A novel coronavirus termed as SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) has been the causative agent of a pandemic that originated in Wuhan China in December 2019.¹ Coronavirus disease-2019 (COVID-19) can present with a wide variety of complications during infection. For optimal management of these patients, understanding of various systemic manifestations and

complications of SARS-CoV-2 is vital. Although in COVID-19 respiratory symptoms are commonly encountered, both arterial and venous thrombosis can also occur leading to life threatening complications. Arterial thrombosis leading to stroke, acute limb ischemia, acute mesenteric ischemia and acute coronary syndrome has been observed.²⁻⁵

The pathology leading AMI in COVID-19 is exactly not known at present. There are four mechanisms which has been put forth to explain this severe complication of COVID-19. First, mesenteric vascular thrombosis due to hypercoagulability induced by systemic inflammation,

hypoxia, endothelial injury and activation and immobilization.⁶ Second, raised levels of Von-Willebrand Factor in severe cases of COVID-19. Von-Willebrand factor is released from Weibel-Palade bodies in response to endothelial damage. Expression of angiotensin converting enzyme 2 in vascular endothelium, the target receptor for severe acute respiratory syndrome 2 (SARS-CoV-2), which may explain the tropism to endothelial cell of SARS-CoV-2 which might lead to endothelial damage and dysfunction resulting in thrombosis of the vessels.⁷ Third, expression of angiotensin converting enzyme 2 on enterocytes of small bowel and this may result in affinity to intestinal vessel leading to direct damage to the bowel. Lastly, non-occlusive mesenteric ischemia because of shock or hemodynamic instability which is commonly seen in patients with COVID-19 pneumonia may be one of the pathological factors involved.⁸

This is a retrospective observational study conducted to determine the occurrence of mesenteric ischemia in patients with history of COVID-19 infection in a tertiary health care centre in Bangalore.

METHODS

This is a retrospective observational study conducted in the department of general surgery in Bangalore medical college and research institute, Bangalore over a period of 3 months from October 2021 to December 2021.

Inclusion criteria

Patients above 18 years of age, patients diagnosed to have mesenteric ischemia and patients/attenders of the patient giving informed consent were included in the study.

Exclusion criteria

Patients below 18 years of age and not giving consent were excluded from the study.

A total of 15 patients who presented to the emergency department and was diagnosed to have mesenteric ischemia were included in the study. Retrospective study was conducted after taking informed consent from the patient and the attenders. Detailed history regarding the symptoms and signs were elicited. History regarding infection with COVID-19, history of contact with infected COVID-19 patients, history regarding development of COVID-19 symptoms but not getting tested and history of vaccinations were elicited.

The patients who were diagnosed to have gangrenous bowel on CECT abdomen and pelvis scan were taken up for emergency exploratory laparotomy and gangrenous bowel was resected and anastomosis or stoma were done depending upon the length of the bowel involved and hemodynamic status of the patient. The patients were

shifted to intensive care unit and were managed appropriately.

RESULTS

Total of 15 patients were included in the study. Out of which 9 (60%) were male patients and 6 (40%) were female patients. Mean age of the patients was 41.86 years. There were 2 (13.33%) patients between the age of 18 and 30 years, 7 (46.66%) patients between the age of 31 to 40 years, 3 (20%) patients between the age of 41 to 50 years, 2 (13.33%) patients between 51 to 60 years and 1 (6.66%) patient above 60 years of age.

Among the 15 patients, 5 (33.33%) patients had history of RT-PCR positive during the first or the second wave of COVID-19 pandemic, 7 (46.66%) patients were tested RT-PCR negative for COVID-19 when they were symptomatic or when they had history of contact with a RT-PCR positive COVID-19 patient whereas 3 (20%) patients did not get tested for COVID-19 when they had symptoms of COVID-19 infection or when they had history of contact with COVID-19 patients. Among the 5 infected patients 3 of them give history of hospital admission and 2 of the patients opted for home quarantine. None of the patients were tested positive for COVID-19 at the time of presentation.

Among the 15 patients, 6 (40%) of the patients had taken 2 doses of COVID-19 vaccines, 8 (53.33%) of them had taken single dose of COVID-19 vaccination and 1 (6.66%) patient was not vaccinated.

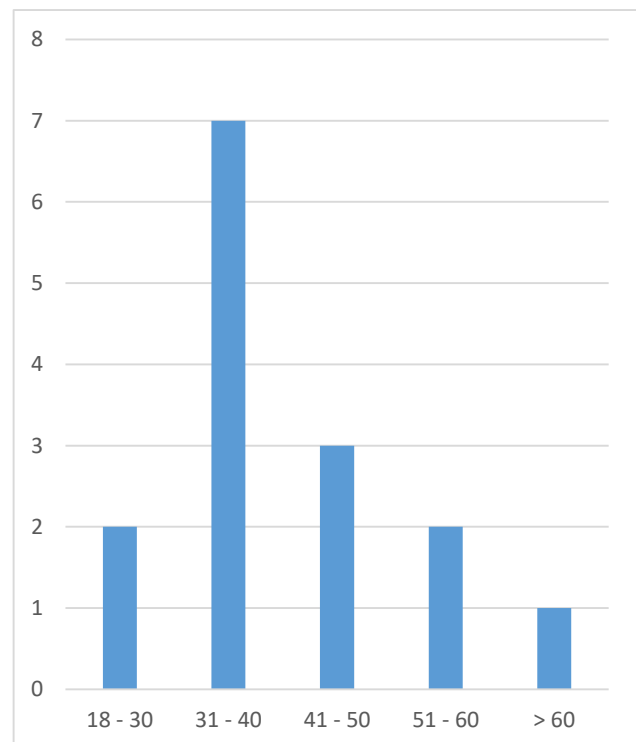


Figure 1: Age of patients.

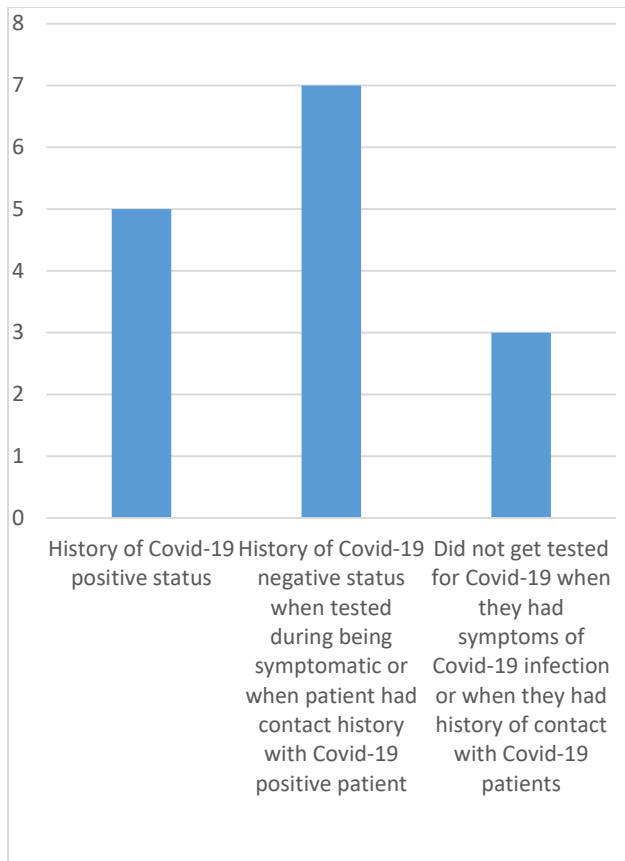


Figure 2: COVID-19 status of the patients.

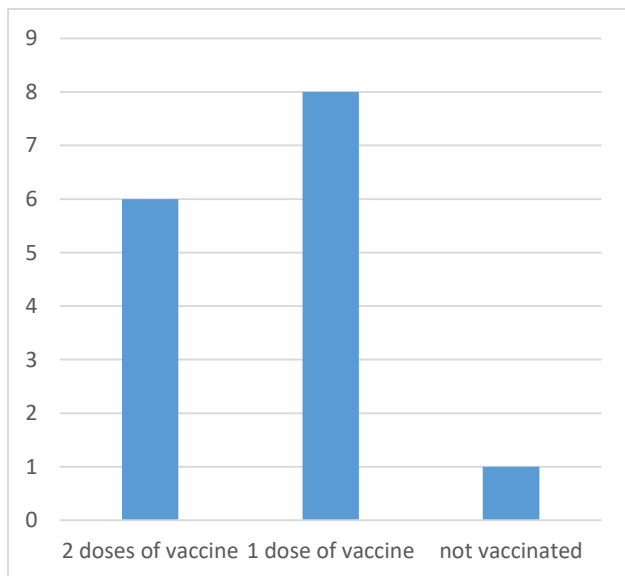


Figure 3: Vaccination status of the patients.

DISCUSSION

COVID-19 has multifaceted presentation, with symptoms ranging from asymptomatic to rapid multiple organ dysfunction, and has high mortality with case fatality rate of 2.3%.⁹ In addition to pulmonary symptoms, gastrointestinal symptoms of abdominal pain, nausea,

vomiting, non-bloody diarrhoea have also been identified.¹⁰⁻¹² It has also been described to predispose to venous and arterial thromboembolism. Thromboembolic complications are being increasingly recognized in coronavirus-19 (COVID-19) pneumonia.¹³ The mortality rate of AMI in COVID-19 is still unknown, yet it is likely to contribute significantly to an increased burden of disease. It is thus of the utmost importance to raise awareness among clinicians to recognize the typical signs of mesenteric ischemia as early diagnosis and timely intervention are essential to decrease the mortality curve.

Total of 15 patients were included in our study. Mean age of the patients was 41.86 years in our study, 5 patients had history of being tested positive for COVID-19 and another 3 of the patients had history of being symptomatic or coming in contact with a COVID-19 patient but was not tested. In this study, vaccination status does not have any significance in determining the possibility of increase or decrease in the incidence of mesenteric ischemia.

We cannot completely attribute COVID-19 infection being the cause of mesenteric ischemia in these patients, but being infected may or may not have accelerated the progression of mesenteric vessel thrombosis in these patients. All the other risk factors of bowel gangrene must also be considered when determining the etiology of mesenteric ischemia. Till now, there are only small number of reported cases that show the relation between SARS-CoV-2 infection and mesenteric ischemia, nevertheless, it is important to consider it also as a possible risk factor in the causation of the disease and other gastrointestinal symptoms.

CONCLUSION

Knowledge of occurrence of mesenteric vessel thrombosis in patients with history of COVID-19 infection is essential for the health care workers and the patients and their attenders for timely consultation, diagnosis and management. And continuing prompt administration of thromboprophylaxis in high-risk individuals and development of a screening method for identifying high risk individuals and sensitizing the public regarding the complications of COVID-19 is essential to reduce the morbidity and mortality caused by mesenteric ischemia.

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