Acute necrotizing pancreatitis associated with Covid-19: A case report

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Abstract

Coronavirus infection is commonly associated with pulmonary manifestations. Extra pulmonary manifestations including gastrointestinal involvement is also well established recently in COVID positive patients. However, pancreatic involvement due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection is an unusual presentation and therefore much more attention has to be given to the pancreatic injury caused by SARS-CoV-2 infection. There is different pathophysiology behind the pancreatic dysfunction associated with SARS-CoV-2 infection. It can either be the systematic inflammatory immune response causing tissue damage or direct invasion of pancreatic cells. The virus enters the host cells or tissues via its spike protein that binds to the angiotensin-converting enzyme 2 (ACE2) present in the pancreatic islets cells, which in turn leads to pancreatic injury and dysfunction. It can also occur as an adverse effect of medications like ritonavir-lopinavir that is a therapeutic option for COVID-19 patients. Here, we report a case of a patient with COVID-19-induced acute pancreatitis where medical history and further investigations eliminated all the other expected causes of pancreatitis. He came with complaints of hiccups for two weeks and abdominal pain. He tested positive for COVID-19 and was managed with antibiotics like meropenem. Laboratory investigations as well as computed tomography abdomen paved way for the detection of pancreatic involvement. Pancreatic injury and COVID-19 infection were resolved during the course in hospital and the patient was discharged on medications including zinc, vitamin C supplementation, and also with ciprofloxacin.

Key words: COVID-19, SARS-CoV-2, angiotensin converting enzyme 2, computed tomography, pancreatitis.

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Introduction

Most Corona virus disease infected patients will experience mild to moderate respiratory illness and recover without treatment, however some patients will become seriously ill, especially in older patients and patients with underlying comorbidities like cardiovascular disease, diabetes mellitus, chronic respiratory illness, and malignancy. The first reports came from Wuhan, China in December 2019 where it emerged as an epidemic and later the World Health Organization declared it as a global pandemic. The clinical manifestations associated with COVID-19 varies from an asymptomatic state to an acute respiratory distress syndrome and multi organ dysfunction. Cough, fever, sore throat, headache, breathlessness, fatigue, and myalgia are the common clinical symptoms associated with this infection. (1-3) Extra pulmonary manifestations affecting gastrointestinal and hepatobiliary systems include nausea, vomiting, abdominal pain, anorexia, and diarrhoea. Recently, even pancreatic injury was

reported following COVID-19 infection. (4) A study conducted on 52 COVID-19 patients with pneumonia revealed that 17% of the study subjects showed pancreatic injury where an abnormality in the serum amylase or lipase level was described as the criteria for the pancreatic injury. (5) It is an extremely challenging situation for the clinicians to handle when a patient with COVID-19 infection develops pancreatitis since an accelerated clinical course is required. Even though no studies have revealed the actual pathogenesis of the pancreatitis due to COVID-19 infection, it is believed that the pancreatitis develops due to the direct cytopathic effect resulting from the local replication of SARS-CoV-2. However, gastrointestinal symptoms are common in COVID-19 infected patients but not much consideration has been given to pancreatic injury resulting from a COVID-19 infection. Therefore, here we report a case of a COVID-19 infected patient with acute necrotizing pancreatitis who had no known co-morbidities.

Case presentation

A 43-year-old male patient was admitted for the evaluation of hiccups and subsequently tested positive for COVID-19. He was admitted in the isolation ward and had a history of abdominal pain. His blood counts and inflammatory parameters were on the higher side. The laboratory parameters were as follows: haemoglobin of 11.2 g/dl indicating anaemia, elevated white blood cells (WBC) count of 19.63K/µl, decreased red blood cells (RBC) count of 3.64 million/µl, and platelet count of 314K/µl. Highly elevated C-reactive protein level of 208.01 mg/l was found. Calcium levels were normal. Serum urea level was 58.1 mg/dl. Elevated total bilirubin level of 2.69 mg/dl, direct bilirubin level of 1.28 mg/dl, and serum creatinine level of 1.64 mg/dl were observed. Increase in serum amylase and lipase level was found (154 U/L and 265.7 U/L, respectively). Significant increase in serum ferritin level of 3413 ng/ml, serum lactate dehydrogenase of 423 U/l as well as D-dimer level of 7.46 µg/ml was observed. Abnormal procalcitonin level of 0.79 ng/ml was also seen. Gastroenterology consultation was sought. Computed tomography abdomen showed significant peri-pancreatic oedema and stranding in the anterior and posterior peri-pancreatic space. There was diffuse peritoneal and omental nodularity. An acute necrotic collection in the greater omentum with maximum thickness of 30 mm was noted. These features were suggestive of acute necrotizing pancreatitis and the omental nodularity indicated the probability of an infective process (**Figure 1**). Chest computed tomography (CT) showed COVID-19 Reporting and Data System-VI or CORADS-VI (moderate - COVID) with CT severity score of 11/25 (moderate). Calcified retroperitoneal and mediastinal lymph nodes with bilateral lung air space opacities as well as omental nodularities were seen. He was started on meropenem, heparin, favipiravir, and other supportive measures. Cardiology consultation was also done in view of sinus tachycardia and was started on beta-blockers transiently. Condition of the patient gradually improved and he tolerated oral feeds. Inflammatory parameters were on reducing trends and hence he was discharged on ciprofloxacin, zinc, and vitamin C tablets as his COVID antigen test came negative.

Discussion

Acute pancreatitis is an inflammation of the exocrine pancreas, developed primarily due to alcohol consumption and gallstones. Intra-pancreatic protease activation resulting from impaired zymogen secretion and acinar cell injury is the main aetiology behind this disease. The diagnostic criteria focus mainly on three aspects namely the imaging findings, relevant history, and three-fold elevation in the increased serum lipase or amylase in comparison to the normal laboratory reference range. (6) SARS-CoV-2 virus enters the host cell via ACE2, which is expressed in different human organs. The ACE2 enzyme receptor activation is strongly found in the endocrine portion of pancreas, but it is less in exocrine tissue, subsequently there are only few case reports of COVID-induced pancreatitis. (7) In our patient, elevated serum amylase as well as computed tomography findings justified the diagnosis of acute pancreatitis.

A study aimed at determining the distribution as well as the expression of ACE2 receptor of SARS-CoV-2 concluded that the expression of ACE2 was more in pancreas compared to lungs. (8) This highlights the fact that pancreas serves as a target for SARS-CoV-2, even though the exact pathogenesis behind the occurrence of pancreatitis due to COVID-19 is uncertain. Systemic inflammatory response is the most severe complication associated with COVID-19 infection. In the case of acute pancreatitis, excessive systemic inflammatory response syndrome can further progress to multi organ failure and distant organ damage. The main aetiology behind this inflammatory response seen in both pancreatitis and COVID-19 is the activation of tumour necrosis factor alpha, interleukin 10, and interleukin 6. (9) Hanley et al. conducted a study where he re-

ported histopathological findings of ten adult patients who died due to COVID-19 infection. Lung was the predominant organ involved in these patients. They also observed pancreatitis in two patients and one of them had necrotizing haemorrhagic pancreatitis. (10) In most of the reported cases, acute pancreatitis is seen in patients with COVID-19 pneumonia infection, but in our case the patient primarily showed features of acute pancreatitis and was not associated with much pulmonary symptoms. Therefore, this report reveals the fact that SARS-CoV-2 can be an important etiological factor behind the acute pancreatitis.

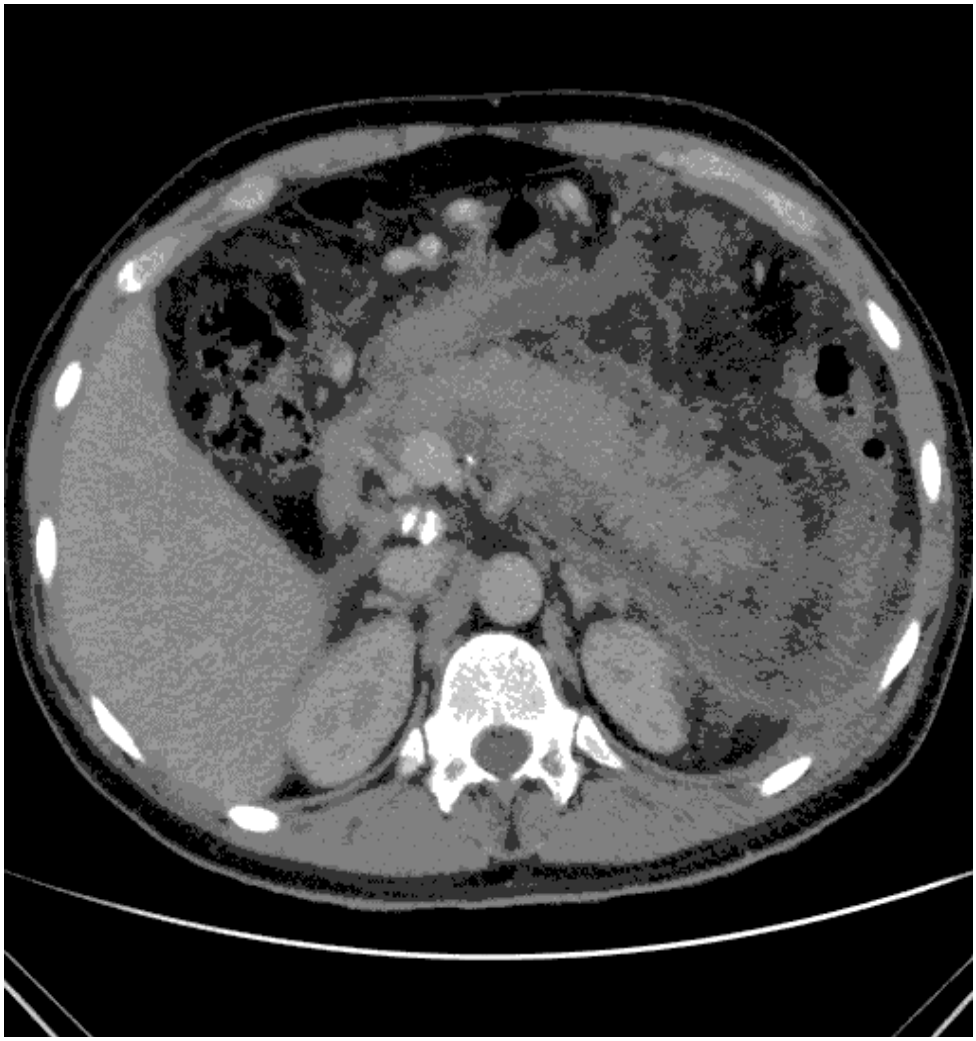
Conclusion

Several viruses are implicated in the aetiology of pancreatitis. The exact mechanism of this viral pancreatitis is unknown. Here, we report a case of COVID-19-induced acute necrotizing pancreatitis. In the present scenario, it is mandatory to screen for SARS-CoV-2 virus in patients presenting with pancreatic type of abdominal pain as well as strict monitoring of pancreatic parameters should be done.

Conflict of interest

There is no conflict of interest.

Figure 1. Computed tomography abdomen showing acute necrotizing pancreatitis



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