

## A Case Of Acute Pancreatitis in an Adult Patient Recovering From COVID-19

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### INTRODUCTION

SARS-CoV-2 is a novel human coronavirus responsible for the ongoing COVID-19 pandemic. Although it is primarily a respiratory virus, SARS-CoV-2 also has extra-pulmonary effects involving the haematological, cardiovascular, renal, gastrointestinal and hepatobiliary, endocrine, neurological, ophthalmological and dermatological systems. Pancreatic injury and cases of acute pancreatitis have been recognized and attributed to SARS-CoV-2, but the causative relationship and mechanisms of pancreatic injury are still a subject of debate. About 1%-2% of non-severe and 17% of severe cases of COVID-19 exhibit pancreatic injury<sup>1</sup>. Here, we present a case of acute pancreatitis in a young male who had recently recovered from COVID-19.

### THE CASE

A twenty-five years old previously healthy male patient presented to the emergency room with complaints of sore throat and generalized body ache of four days duration. There was no fever, cough or shortness of breath. He denied history of any confirmed COVID-19 contact. The patient was haemodynamically stable with unremarkable chest examination. He tested positive for SARS-CoV-2 through a nasopharyngeal swab, detected by real time reverse transcription PCR with cycle threshold value of 32<sup>1</sup>. The patient was advised home isolation for ten days according to the prevalent national guidelines<sup>2</sup>. His home isolation was largely uneventful except for a self-limited diarrhea for 2 days.

Five days after recovery, he presented to the emergency department with history of epigastric pain of two days duration, which had increased in severity since one day. Initially the pain was dull aching and intermittent but later had become constant. It was radiating to the right upper quadrant and back and was unrelated to meals. There was no associated jaundice, fever or vomiting. The patient had a normal bowel movement.

Neither did he use alcohol nor was he on any medicines. He denied past history of similar symptoms. There was no history of gall bladder calculi. He had not undergone any invasive procedure like endoscopic retrograde cholangiopancreatography. Blunt trauma to the abdomen was ruled out. There was no family history of pancreatitis or pancreas related illnesses. On physical examination the patient was afebrile and vitally stable. Abdomen was soft, with epigastric tenderness and normal bowel sounds. Other systemic examination was unremarkable. Laboratory investigations showed slightly raised WBC count to 12.3 K/cumm with normal haematocrit and platelets. C-reactive protein was 11.6 mg/L. Serum amylase was 151 IU/L and serum lipase 667 U/L.

The liver and renal function tests were completely normal. Lipid profile and serum calcium were normal. Chest X-ray was normal.

Contrast enhanced abdominal computed tomography showed swollen pancreas and fat stranding around the head. Findings were suggestive of acute pancreatitis without necrosis or peripancreatic fluid collection (Figure 1A and B).

Patient was diagnosed to have mild acute pancreatitis secondary to recent COVID-19 infection and was admitted to the ward. The bedside index of severity in acute pancreatitis (BISAP) score was zero.

Patient responded well to the standard treatment measures including initial nil per os, intravenous hydration and analgesia and tolerated gradual introduction of fat free diet. He was discharged home after 4 days of uneventful hospital stay. Other rare causes of acute pancreatitis like biliary microlithiasis and IgG4 pancreatitis were not considered as serial liver function tests were completely normal and this was not a recurrent episode of pancreatitis. There were no anatomical anomalies of the pancreas on imaging.



Figure 1(A): CT abdomen axial section

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Figure 1(B): CT abdomen coronal section

Figure 1(A and B) : Abdominal computed tomography showed swollen pancreas with fat stranding seen around the head. There was no evidence of parenchymal necrosis, peripancreatic fluid collection or parenchymal calcification. CT severity index was 2 consistent with mild acute pancreatitis.

## DISCUSSION

Acute pancreatitis is an inflammation of the exocrine pancreas most commonly caused by gall stones or alcohol consumption. Other causes include hypertriglyceridemia, hypercalcemia, drug induced, ischemic or procedure related. Rarely abdominal trauma, a variety of viruses and intestinal parasites have been implicated. The pathophysiology involves injury to the pancreatic acinar cells and impairment of proenzyme secretion leading to activation of proteases causing inflammation. According to the widely accepted revised Atlanta criteria, the diagnosis of acute pancreatitis requires fulfilment of two of the three criteria : 1) Abdominal pain consistent with acute pancreatitis, 2) serum amylase or lipase activity atleast three times the upper limit of normal, and 3) characteristic findings on contrast enhanced CT, MRI or USG abdomen<sup>3</sup>.

SARS-CoV-2 is a single, positive-stranded RNA virus. The virus binds to target cells via a hidden receptor-binding domain of the Spike protein to the angiotensin-converting enzyme 2 (ACE-2)<sup>4</sup>, which acts as a functional receptor. In the initial phase of the disease, infection occurs in the nasal epithelial cells expressing ACE-2, while later in the course, the lower respiratory tract is involved manifesting as pneumonitis<sup>5</sup>. SARS-CoV-2 can also cause extra pulmonary manifestations as epithelial cells in intestines, kidneys, pancreas and blood vessels are also known to express ACE-2. Liu et al demonstrated the presence of ACE-2 in pancreatic ductal, acinar and islet cells, thereby lending credence to the theory of COVID-19 related pancreatic injury<sup>1</sup>. Proposed mechanisms of pancreatic injury include direct virus-mediated injury, systemic inflammatory response and circulating pro-inflammatory interleukins, virus-induced lipotoxicity, and drug-induced injury<sup>6</sup>.

Several cases of pancreatitis in patients with COVID-19 have been reported in the literature. A recent systematic review of the literature revealed 22 cases of acute pancreatitis in COVID-19 patients<sup>6</sup>. The time frame of SARS-CoV-2 infection and the development of acute pancreatitis is heterogeneous. Some patients develop COVID-19 symptoms and abdominal pain at the beginning of the infection, and others have acute pancreatitis days after COVID-19 is diagnosed. Moreover, in a case series published by Elhence et al, three cases of severe acute pancreatitis with respiratory failure tested positive for COVID-19 several days after the diagnosis of acute pancreatitis (34 to 91 days from admission)<sup>7</sup>. Gupta et al reported a case of acute pancreatitis in a patient diagnosed with COVID-19 in the absence of most common risk factors of pancreatitis. Their patient developed pancreatitis on the eighth day of illness<sup>8</sup>.

Aloyisus et al from the USA reported a patient diagnosed with COVID-19 complicated with ARDS and acute severe pancreatitis<sup>9</sup>. A case report by Anand et al describes the development of acute pancreatitis in a patient ten days after the first positive PCR report. The patient was readmitted after discharge with fever, abdominal pain, and constipation, and CT obtained on day 3 of readmission indicated acute pancreatitis<sup>10</sup>. A multitude of similar cases have been reported by Lakshmanan and Malik<sup>11</sup>, Meireles et al<sup>12</sup>, Mazrouei et al<sup>13</sup> and more recently by AlHarmi et al<sup>14</sup>.

Wang et al profiled the symptomatology and found that patients with pancreatic injury had a more severe illness on admission and were more likely to have loss of appetite and diarrhoea<sup>15</sup>.

Interestingly, Szatmary et al suggest that a combination of male sex, abdominal pain and pancreaticoduodenal inflammation with steatosis on imaging represents a distinct subset of COVID-19 patients in whom the endocrine pancreas is particularly vulnerable. Our patient mostly fits into this description<sup>16</sup>.

In their unique paper about the histopathological post-mortem findings in patients who died due to COVID-19, Hanley et al reported the unexpected finding of pancreatitis in 2 out of 10 patients, with the first having gross necrotizing hemorrhagic pancreatitis and the second having only microscopic evidence of acute inflammation in the pancreas<sup>17</sup>.

Despite the ever-growing list of aforementioned case reports and studies, a recent systematic review concluded that currently, there is no sufficient evidence showing that COVID-19 can cause acute pancreatitis or negatively impact the prognosis<sup>6</sup>. Therefore, at this stage, further research is needed to explore this possible, but yet unproven, association.

## SUMMARY

COVID-19 infection is being extensively studied worldwide. Although the causal relationship between SARS-CoV-2 and acute pancreatitis has not been firmly demonstrated, their co-occurrence is being increasingly reported. Our case report highlights the fact that in order to enable early appropriate treatment and avoid complications, acute pancreatitis should be considered at the top of differential diagnoses when a COVID-19 patient complains of characteristic abdominal pain. No specific recommendations are made regarding treatment of acute pancreatitis in COVID-19 patients. However, careful monitoring and follow up is advised as COVID-19 patients may pose specific and unpredictable challenges in treatment.

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**Competing Interest:** None.

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