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COVID-19 induced acute pancreatitis after resolution of the infection

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Abstract

The coronavirus disease 2019 (COVID-19) has been linked to many systemic inflammatory reactions and high morbidity and mortality rates. Patients with gastrointestinal symptoms progress more rapidly than others. COVID-19 induced acute pancreatitis is not common and can occur in cases of mild infection or even after resolution of the viral infection. We report a case of a 71-years-old male with multiple comorbidities that was admitted as a case of COVID-19 pneumonia for 10 days. Afterwards, the patient was discharged with resolution of the infection and presented two days later with signs of acute pancreatitis. On further investigation, it was confirmed that his acute pancreatitis was due to his previous COVID-19 infection. In conclusion, COVID-19 induced acute pancreatitis is serious and can develop rapidly. Close monitoring and admission are necessary to keep proper hydration.

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Introduction

The coronavirus disease 2019 (COVID-19) pandemic is now a major global health threat that first emerged in Wuhan, China. As of 2021, more than 100 million individuals over 210 countries have been confirmed to have been infected with the virus [1]. COVID-19 has been linked to cause many organs damage including the lungs, heart, kidneys and can lead to multiorgan failure [2]. The characteristics of the disease itself is still being discovered with the emerging of new variant of the virus consistently. Pancreatic injury in COVID-19 has been scarce and not common. Wang et al. (2020) [3] studied the pancreatic injury patterns among COVID-19 and reported that out of 52 patients that were admitted in as confirmed cases of COVID-19 with pneumonia, 17% had pancreatic injury while only 5% had multiple comorbidities [3].

no significant difference in Steroid treatment, invasive ventilation, or negative conversion time between patient with pancreatic injury or without was found [3]. The most common reported gastrointestinal symptoms associated with pancreatic injury in COVID-19 are diarrhea and abdominal pain [3]. The pathophysiology between the virus and pancreatic injury is controversial. However, studies suggest that pancreas has angiotensin-converting enzyme-2 (ACE2) which cause it susceptible to SARS-CoV-2, these receptors bind to the pancreatic cells causing injury [4]. Lipasemia generally appeared after the highest systemic inflammatory activity leading to secretion of pancreatic enzymes such as lipase [9]. The high level of lipase enzyme has been shown in multiple conditions including infections, renal impairment, gastrointestinal, hepatobiliary disease and some drug induced [9]. In this case, we report a male patient with multiple comorbidities who was cleared of COVID-19 infection and developed acute pancreatitis afterwards.

Case report

A 71-years-old male patient presented to the emergency department complaining of Fever, shortness of breath and cough. The patient medical history included type I diabetes mellitus, hypertension, hypothyroidism, end stage renal disease on regular hemodialysis. He takes valsartan for hypertension, insulin lispro and glargine for diabetes, levothyroxine for hypothyroidism, alfacalcidol, calcium carbonate, vitamin B. He had no history of alcohol consumption. Afterwards, COVID-19 was confirmed based on Polymerase Chain Reaction (PCR) and was admitted as covid pneumonia case. Initial reaction (PCR) was 79.6 mg/L. The patient required continuous positive airway pressure (CPAP) to maintain oxygenation. He
systemic examination was unremarkable. Laboratory investigation showed WBC of 19.5 × 10⁹/L, hemoglobin 12 g/L, platelet count 327 × 10⁹/L, CRP of 353.8 mg/L, lipase 1023 U/L, amylase 544 U/L, calcium 2.47 mmol/L, albumin 36 g/L, and triglycerides 1.78 mmol/L. Management included aggressive intravenous fluid and intravenous broad spectrum antibiotic coverage with meropenem. Abdominal ultrasound showed no signs of choledocholithiasis, intra or extra hepatic duct dilation, gallstones or focal mass. The pancreas and mid-abdominal structures are obscured by excessive overlying bowel gases. Abdominal Computed Tomography (CT) with intravenous contrast showed inflammatory changes around the pancreatic head and tail suggestive of acute pancreatitis (Fig. 1). No gallstones, cholecystitis or intra or extra hepatic duct dilation was noted.

Discussion

The 2020 pandemic caused by the newly COVID-10, known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), impacted the healthcare system globally [5]. Covid-19 infection affects the lungs as the main organ of infection. However, gastrointestinal symptoms and manifestation has been linked to mild, moderate and severe cases of COVID-19 [5]. The first reported COVID-19 case in USA showed that the patient presented with respiratory symptoms initially followed by gastrointestinal symptoms of abdominal pain and diarrhea on the second day [6]. Gastro-intestinal symptoms are of significance because previously reported studies showed that gastrointestinal manifestations along COVID-19 worsens dramatically and progressively faster than any other system [5]. Therefore, patients who contrast COVID-19 and develop gastrointestinal symptoms should be admitted and observed carefully.

Acute Pancreatitis (AP) is an acute inflammatory disease of the pancreas associated with high morbidity. AP can be caused by alcohol consumption and gallstones. It can be diagnosed by the presence of acute epigastric abdominal pain and abnormal increase of pancreatic enzymes which can reach three folds above the normal limit. Radiological findings on imaging play a crucial role for diagnosing acute pancreatitis associated with COVID-19 [6]. Similarly, our patient did not show any signs of pancreatic disease on ultrasound but signs of AP was found after doing CT with intravenous contrast. COVID-19 induced AP has been observed in a previous case-series showing that 17% of COVID-19 patients presented with elevated levels of pancreatic enzymes [8]. Comparably, our case did show signs of induced COVID-19 AP as it was rapid and progressive two days after discharge. Pancreatic injury in COVID-19 might occur via different ways. First, the ACE2 receptor expression is demonstrated high in the exocrine glands and islet cells of Langerhans when compared to that in the lungs [4]. Therefore, the viral replication of SARS-CoV-2 could cause cytopathic pancreatic harm. Secondly, the involvement of immune system when its affected by SARS-CoV-2 to cause multiple organ failure including pancreas which is well-known to occur in cases of pneumonia and intensive care unit submissions [7].

Conclusion

COVID-19 induce acute pancreatitis is possible and can present initially with signs of abdominal pain even after resolution of the viral infection. Hyperlipasemia reported to be a usual finding in Covid-19 particularly those associated ARDS [10]. However, pancreatic enzymes such as amylase and lipase can be secreted by other organs beside the pancreas such as lungs. Also, high serum activity of amylase and lipase are reported in conditions like severe gastroenteritis, diabetes, post cardiovascular surgery, trauma, burns and, in renal impairment due to the renal clearance of pancreatic enzymes [10]. Since our patient did not have burns, trauma or surgery, SARS-CoV2 is known to influence the gastrointestinal tract and serum lipasemia could be the cause of the inflammation of gastrointestinal tract. The other fact is that the activity and replication of the virus in the gut persisted even after the virus was cleared from the respiratory tract which comprises this explanation. In the absence of all possible causes of acute pancreatitis, COVID-19 can be the sole culprit of acute pancreatitis even in mild cases of pneumonia.

Ethical consideration

An informed written consent was obtained from the patient in order to publish the report.

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