



Case Report

Coronavirus disease 2019 (COVID 19) induced acute necrotizing pancreatitis in a female child: A case report

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1. Introduction

Coronavirus disease 2019 (COVID 19) has been noticed to infect different organ systems including the respiratory, gastrointestinal and cardiovascular system. Fever, cough, sore throat, dyspnea, headache and myalgia are most common manifestations of COVID 19 infection [1]. When the gastrointestinal system is involved, anorexia, nausea, vomiting, abdominal pain, and diarrhea are common presenting symptoms. Pancreatic involvement in COVID 19 infection is very uncommon and has rarely been reported in literature. It is postulated that expression of Angiotensin-Converting Enzyme 2 (ACE2) receptors in the pancreatic cell is responsible for pancreatic involvement [2]. Glycosylated-spike (S) protein in corona virus binds to ACE2 receptors in the pancreas leading to acute pancreatitis [3]. Here, we present a case of acute pancreatitis in a 12 years old female child with COVID 19.

2. Case summary

A 12 years old female presented to the emergency department with the chief complaints of fever, dry cough, lethargy and shortness of breath for four days. The patient also had multiple episodes of vomiting which was associated with epigastric pain which was sudden in onset, progressive in nature with no aggravating and relieving factors. She had no significant past medical and surgical history. She was not taking any

regular medications.

On presentation to emergency department, she was alert and oriented. Her Glasgow Coma Scale (GCS) was 15/15. Her initial evaluation revealed a temperature of 99 °F, a blood pressure of 110/70 mmHg, a heart rate of 98 beats per minute, a respiratory rate of 24 per minute, and an oxygen saturation of 88% in room air. Chest examination revealed decreased air entry in bilateral axillary region with occasional crepitations. Abdominal examination revealed mild epigastric tenderness. Otherwise, the rest of the physical exam was non-significant.

Routine laboratory tests revealed a total leucocyte count of 23,210 cells/m³ with 76% polymorphs. Low-density lipoprotein (LDL) was 68 mg/dL, high-density lipoprotein (HDL) 23 mg/dL, serum cholesterol 133 mg/dL, and serum triglyceride 209 mg/dL. C-Reactive protein (CRP) was elevated to 90 mg/L, lactate dehydrogenase (LDH) was elevated to 435 U/L and D-dimer was elevated to 5000 ng/ml. Erythrocyte sedimentation rate (ESR) was raised to 21 mm/hr. Serum lipase was 253 U/L and amylase 50 U/L. Prothrombin Time (PT) and activated partial thromboplastin clotting time (aPTT) were raised to 26.4 and 40.5 seconds respectively. Serum calcium level was found to be 0.68 mmol/L.

Contrast enhanced computed tomography (CECT) of the chest revealed bilateral mild pleural effusion with basal atelectasis (Fig. 1). She tested positive for COVID 19 by polymerase chain reaction (PCR) test. Abdominal ultrasonography (USG) revealed normal-sized liver and biliary ducts with enlarged pancreas. There was no evidence of gallstone

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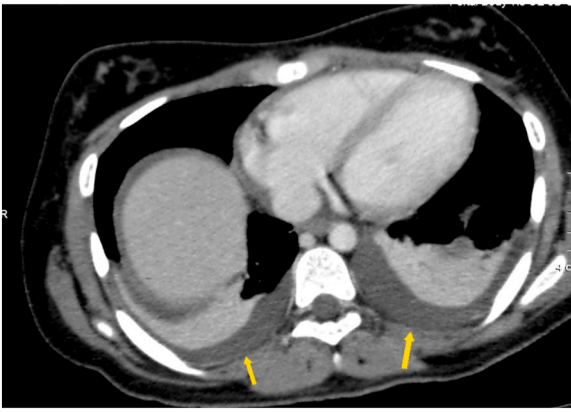


Fig. 1. CECT of the chest revealing bilateral mild pleural effusion (yellow arrow) with basal atelectasis. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

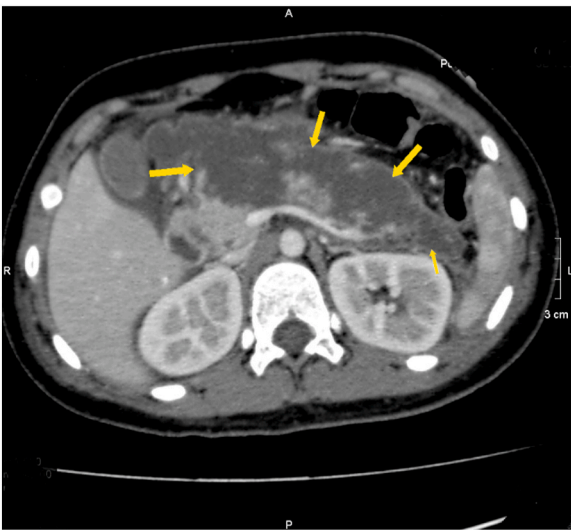


Fig. 2. CECT abdomen revealing necrosed pancreatic parenchyma predominantly involving body and tail with necrotic fluid collect as shown by the yellow arrow. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)



Fig. 3. CECT of abdomen revealing small non-occlusive thrombus in the splenic vein as shown by yellow arrow. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

in abdominal USG. CECT abdomen revealed necrosed pancreatic parenchyma predominantly involving the body and tail with necrotic fluid collection (Figs. 2 and 3).

She was admitted to the intensive care unit and was managed symptomatically with intravenous fluids, and analgesics. Intravenous dexamethasone and subcutaneous low molecular weight heparin (LMWH) was given as per COVID protocol. She was started on high-flow oxygen supplementation for hypoxic respiratory failure. Her temperature subsided gradually. Oxygen requirement declined over the next 12 days with gradual improvement in her pulmonary and gastrointestinal symptoms and she was discharged. The patient was asymptomatic on 14th day follow-up.

3. Discussion

More than half of the patient with COVID 19 infection develops gastrointestinal symptoms such as nausea, vomiting, diarrhea and abdominal pain; diarrhea being the most common symptom in adults whereas vomiting is found to be more prominent in children. However, pancreatic involvement is very rare and in pediatric population it is even rarer [4]. A study done by Fan Wang has shown that nine out of 52 patients with COVID 19 infection have pancreatic injury [5]. Furthermore, approximately 10% of the COVID 19 positive patients may present only with gastrointestinal symptoms [6].

Pancreatitis has been classified based on organ involvement and duration. Clinical presentation of the patient, laboratory values and the imaging modalities are used to diagnose the acute pancreatitis. Two of the following three criteria must be met to diagnose acute pancreatitis: (1) upper abdominal pain (acute in onset, epigastric area radiating to back) (2) serum lipase or amylase level > three times the upper limit of normal value (3) acute pancreatitis findings on imaging modalities (such as ultrasonography, abdominal CT or magnetic resonance imaging (MRI)) [7]. In our case, the lipase and amylase were not high, possibly due to the necrosed pancreas. Once the diagnosis is made, acute pancreatitis is managed symptomatically with supportive care with intravenous fluid and analgesics [8].

The association of pancreatitis with various viral infections is well known. With ongoing COVID-19 pandemic, the association of this disease with acute pancreatitis has been reported as well. The exact pathophysiology of acute pancreatitis in corona virus disease is still exactly not known. However, Angiotensin receptor-converting enzyme-2 (ACE2) and transmembrane serine protease 2 (TMPRSS2) has been linked to the pathogenesis of acute pancreatitis in corona virus disease [9]. ACE2 expression is usually found in pancreatic islets, exocrine gland and ductal cells while TMPRSS2 is mainly expressed in ductal cells [10]. S glycoprotein which is found in cell surface of the virus binds to ACE2 on surface of host cell leading to entry into the host cell and this process is facilitated by TMPRSS2 [5]. Since these proteins are highly expressed in pancreatic islets, exocrine and ductal cells, it is believed to be behind the pathogenesis of acute pancreatitis.

Acute pancreatitis is notorious to cause inflammation in surrounding areas such as arteries and veins in addition to the pancreas itself. The vessels near the inflamed pancreas undergo inflammatory changes altering the coagulation factor which may result in thrombosis as seen in the splenic vein of our patient. The occurrence of such vascular complications has been reported to be up to 57% in cases of acute necrotizing pancreatitis [11].

Many cases of COVID 19 disease with acute pancreatitis have been reported in the literature. A case report by Gonzalo-Voltas et al. from Spain included a 76 years female with acute pancreatitis in COVID 19 disease without the evidence of gallstones and alcohol [12]. Our patient was healthy, with no family history of any pancreatic disease and had no any evidence of gallstone. The serum triglyceride level of 209 mg/dl is less likely to be a possible cause of pancreatitis in this case. The improvement in her condition with conservative management along with positive PCR for COVID 19 confirmed acute necrotizing

pancreatitis attributable to COVID 19. However, this corona virus still remains an enigma to all of us with varying clinical presentation and findings and more research is required to link COVID 19 with pancreatitis. To our knowledge, this may be the pioneer reported case of COVID 19 induced acute necrotizing pancreatitis in the pediatric age group. This case report has been reported in line with the SCARE 2020 criteria [13].

Conflicts of interest

No any conflicts of interest.

Sources of funding

This study has not received any funding.

Ethical approval

This study was conducted in accordance with ethical standard.

Consent

Written informed consent was obtained from the patient's parent for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Kamal Pandit worked for literature review, discussion of the case report and revision of the case report into its final version. Kripa KC took the relevant history, clinical examination, collected relevant investigations of the patient and wrote the report. Sushil Khanal helped in the revision of the case report into its final version Sanjay Raj Thapa Thapa helped in the revision of the case report into its final version. He was directly involved in patient's management in the hospital. Ritisha Pokharel, Chiranjivi Prasad Shah and Prabhat Adhikari also wrote the case report helped in the revision of the case report into its final version.

Registration of research studies

- 1.Name of the registry: Not applicable
- 2.Unique Identifying number or registration ID:
- 3.Hyperlink to your specific registration (must be publicly accessible and will be checked):

Guarantor

Kamal Pandit.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.amsu.2022.103551>.

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