

Acute Pancreatitis in Early Postpartum Woman with Confirmed Covid-19: A Rare Case Report

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Abstract

Background: The Coronavirus disease 2019 (COVID-19) pandemic is a significant challenge for public health and clinical medicine. COVID-19 mainly impairs the respiratory tract. However, gastrointestinal manifestations of COVID-19 are increasingly being recognized. Although acute viral pancreatitis has been described in other viral infections, pancreatic involvement in SARS-CoV-2 disease is still poorly defined. We reported a case of acute maternal pancreatitis in an early postpartum period woman with confirmed COVID-19.

Case Presentation: A 31-year-old woman in term pregnancy had a caesarean section due to acute respiratory distress syndrome (ARDS) caused by COVID-19 pneumonia. One day after surgery, her stomach appeared bloated, bowel sounds were weak, and her abdominal circumference increased. Ultrasound examination did not reveal any suspicion of bleeding or hematoma. Her abdominal contrast-enhanced computerized tomography (CT) scan showed small bowel obstruction and oedematous pancreas. Amylase levels increased to 382 units/litre and lipase levels to 724 units/litre. C-reactive protein and procalcitonin were also increased. The diagnosis of sepsis was made, and she received broad-spectrum antibiotics and treatment for the COVID-19 infection. Recovery was characterized by a gradual resolution of abdominal and pulmonary signs and symptoms. A decline of amylase and lipase was observed by the tenth day. On the 13th day, she was extubated and gradually recovered from respiratory symptoms, with a negative result for COVID-19 RT-PCR. Based on this case, we consider that pregnancy and COVID-19 support each other as the cause of acute pancreatitis.

Conclusion: Early diagnosis and severity classification are essential steps for successful management because late recognition and treatment may allow a greater prevalence of associated complications.

Keywords: Pancreatitis, COVID-19, pregnancy, caesarean section, case report

Introduction

Acute pancreatitis during pregnancy is a rare, life-threatening clinical disease, with an occurrence of < 1-14 cases per 10,000 births.¹ It has the potential to cause a variety of life-threatening complications. Since acute pancreatitis in pregnancy is rare, diagnosis can be difficult, particularly in the early postpartum. On the other hand, the global COVID-19 pandemic is currently a significant public health and medical issue. COVID-19 is caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), a family of single-stranded

RNA viruses. This disease mainly involves respiratory tract and pulmonary symptoms like cough, shortness of breath, and fever. COVID-19 gastrointestinal manifestations, on the other hand, are becoming more widely known and receiving a lot of attention. Pancreatic involvement in SARS-CoV-2 infection is still poorly understood, even though acute viral pancreatitis has been identified in other viral infections.² Here, we present an atypical case of severe acute pancreatitis occurring in the early postpartum period with COVID-19. The authors have obtained all appropriate patient consent forms.

Case Presentation

A 31-year-old female was referred to the Obstetrics emergency unit Persahabatan General Hospital with the chief complaint of dyspnea for two days. At arrival, her blood pressure was 125/85 mmHg, pulse rate of 117 bpm, respiratory rate of 40 times per minute, body temperature of 37.4°C, and blood oxygen saturation SpO₂ 98% at 8 litres per minute per simple oxygen mask.

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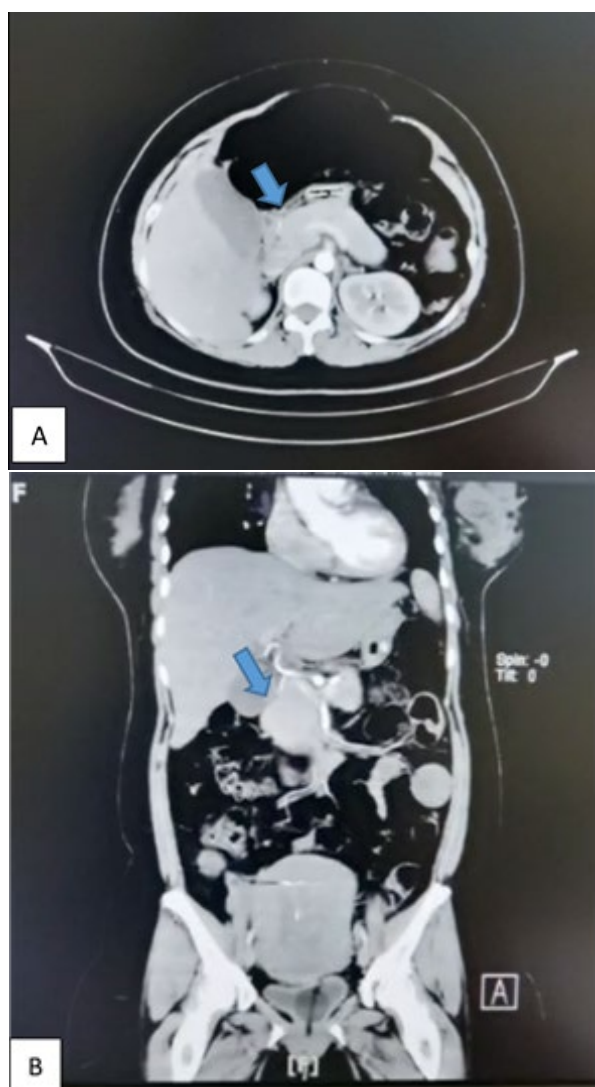


Figure 1. Abdominal CT scan image showing acute pancreatitis.

She did not have any history of cough, cold, fever, or anosmia. Her reverse transcriptase-polymerase chain reaction (RT-PCR) nasopharyngeal swab showed confirmed SARS-CoV-2 infection. Laboratory results showed her hemoglobin level at 12.8 g/dL, leukocytes 13,850/uL, blood glucose 107 mg/dL, D-dimer of 1680 ng/mL, and albumin of 3.2 g/dL. The chest X-rays showed classical signs of COVID-19 pneumonia. She was therefore diagnosed with term pregnancy and acute respiratory distress syndrome (ARDS) due to COVID-19 pneumonia.

An immediate caesarean section was performed under general anaesthesia. A 3000-gram baby was born with an Apgar score of 7/8. After the procedure, she was admitted to the intensive care unit and placed on Synchronized Intermittent Mandatory Ventilation (SIMV) with PEEP of 8 cmH₂O, FiO₂ of 60%, and SpO₂ 100%. She was also treated with remdesivir, azithromycin,

levofloxacin, methylprednisolone, vitamin D3, vitamin C and zinc for COVID-19 infection.

One day after surgery, her stomach appeared bloated, bowel sounds were weak, and her abdominal circumference increased. The uterine contraction was good, and there was no vaginal bleeding. Ultrasound examination did not reveal any suspicion of intra-abdominal bleeding or hematoma. We did not observe any reduction in her hemoglobin level. We chose conservative therapy with total parenteral nutrition and fluid replacement.

Her stomach was still bloated and distended on the third day with increased abdominal circumference. Abdominal contrast-enhanced CT scan showed proximal bowel dilatation, with air-fluid level corresponding with small bowel obstruction. There was also diffusely enlarged pancreas and peripancreatic inflammatory changes suggestive of acute interstitial edematous pancreatitis (Figure 1). The level of pancreatic amylase was 382 units/liter (normal 15-53), and her lipase was at 724 units/liter (normal 13-60). Plasma level of triglycerides was 470 mg/dL, total cholesterol was 251 mg/dL and LDL cholesterol was 154 mg/dL. The plasma blood glucose varied, and there was an increase between 121-269 mg/dL but with a normal HbA1c. C-reactive protein (CRP) and procalcitonin levels increased rapidly (154.6 from 12.9 ng/mL and 0.37 from 0.08 mg/L, respectively).

The patient was thereafter was diagnosed with sepsis and had blood cultures taken. The prognosis of this patient based on Ranson's criteria for pancreatitis was 2, with a 5% mortality risk. She was conservatively managed. She received meropenem, total parenteral nutrition, fluid replacement, gastric decompression, optimization of electrolyte balance, and somatostatin.

She had an uneventful recovery with gradual resolution of her abdominal and pulmonary signs and symptoms. The results of the blood culture showed no bacterial growth. A decline of amylase and lipase was observed by the tenth day.

The patient was extubated after 13 days, with gradual recovery from respiratory symptoms and negative results for RT-PCR. After several days of treatment in the regular ward, her condition got better, and she was discharged afterward. The timeline of this patient can be seen in the figure below (Figure 2).

Discussion

Acute pancreatitis is a rare pregnancy complication, occurring 1 in 1,000 to 3 in 10,000 births. Pancreatitis peripartum may happen during pregnancy or up to six weeks after delivery. The number of patients affected ranges from 1 in 3799 to 11467. Acute pancreatitis is more common with increasing gestational age; over half of cases (52%) occur in the third trimester, while it is uncommon (12%) in the first and second trimesters and just 30% in the postpartum era.³

Although the mechanism underlying the occurrence of peripartum acute pancreatitis is unknown, gallstones are

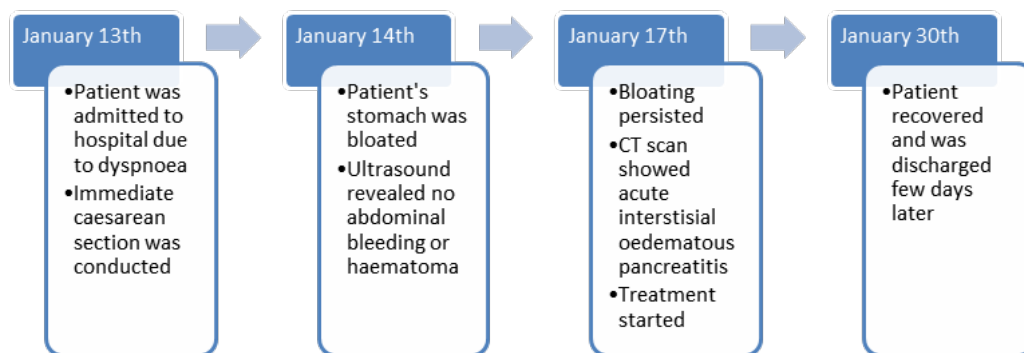


Figure 2. Timeline of Patient Events

thought to be the most common cause of acute pancreatitis during pregnancy, accounting for over 70% of cases. The identified changes in bile composition, gallbladder contractility, and sludge formation during and after pregnancy are most likely to blame for the connection between acute pancreatitis and gallstones during pregnancy and puerperium. Progesterone increases gallbladder volume and delays emptying, causing bile stasis and gallstone formation in late pregnancy, while oestrogen increases cholesterol secretion in hepatic bile, contributing to its supersaturation. Increased intra-abdominal pressure on the biliary duct in the third trimester, as well as a swollen uterus, raise the risk of acute pancreatitis in late pregnancy and early puerperium.^{4,5}

The second most common cause of acute pancreatitis is hyperlipidemia. Triglyceride levels rise 2.5-fold during pregnancy, peaking during the third trimester due to reduced activity of the enzyme lipoprotein lipase, and then steadily decline during postpartum over a six-week period, predisposing women to a higher risk of acute pancreatitis during the third trimester and postpartum.⁶

In around 10% of cases, SARS-CoV-2 viral-induced acute pancreatitis has been identified as the causative factor. The functional host cell receptor for the virus, angiotensin-converting enzyme-2 (ACE-2) receptor, is involved in the disease process. Direct cytopathic effects or indirect systemic inflammatory and immune-mediated cellular responses, resulting in organ damage or secondary enzyme abnormalities, are among the mechanisms of pancreatic injury in SARS-CoV-2 infection. ACE-2 is abundantly distributed in various tissues and explains the disease's presence in multiple organs and extrapulmonary symptoms. ACE-2 in the gastrointestinal tract causes digestive system dysregulation during SARS-CoV-2 infection. Symptoms such as nausea, vomiting, and diarrhea have been recorded in 11% to 50% of cases.^{7,8}

In addition to gastrointestinal symptoms, some blood abnormalities were found in severe COVID-19 patients,

such as increased pancreatic enzymes, suggesting pancreatic injury. The pancreas might be a potential target cell for SARS-CoV-2 infection. Although the exact cause of pancreatitis in COVID-19 is unknown, it may be caused by either the direct cytopathic effect of local SARS-CoV-2 replication or the harmful systemic immune response induced by SARS-CoV-2. According to studies, patients with COVID-19 pneumonia have a 17 percent chance of developing pancreatic injury. However, only 7.46 percent of CT abdomen cases revealed signs of pancreatic injury.⁷⁻⁹

Since the ACE-2 receptor is highly expressed in pancreatic islet cells, infection with SARS-CoV-2 could potentially result in islet damage and acute diabetes. Increased blood glucose levels were observed in this patient. This finding is in accordance with another study which revealed that six out of nine patients with pancreatic injury had an increase in blood glucose level. Since diabetes and ambient hyperglycaemia were independent predictors of death and morbidity in SARS patients, high blood glucose has already been observed with SARS-CoV-2 and may alter disease prognosis. Fortunately, only a tiny percentage of these patients developed diabetes three years after being discharged from the hospital.⁷⁻⁹

According to the current guidelines (revised Atlanta classification), diagnosis of acute pancreatitis requires at least two of the three following signs: (1) abdominal pain, (2) amylase or lipase > three times the normal upper limit, and (3) characteristic findings on diagnostic imaging. CECT (contrast-enhanced computed tomography) has a sensitivity and accuracy of over 90% for diagnosing acute pancreatitis. The pancreas and associated structures are best imaged using CECT. It's handy for determining complications. Under the Balthazar score, abdominal CT is commonly used to calculate the pancreatitis severity index. In this case, peripancreatic inflammation and a skewed pancreatic contour were seen on CT, which corresponded to Balthazar grade B (score 2).¹⁰

Wang et al. described nine out of 52 patients (17%) had pancreatic enzyme abnormalities, with any change above the upper limit of normality being considered, and six of them (66%) also had hyperglycemia.⁷ Liu et al. analysed 121 patients admitted into the hospital; 64 (52.9%) were diagnosed with a severe form of COVID-19.¹¹ Of these patients, 12 (18%) had pancreatic enzyme abnormalities compared to one patient (1.85%) with non-severe COVID-19. A clear connection between severe disease and pancreatic injury was demonstrated, supporting Wang et al findings. Patients who are symptomatic or have moderate gastrointestinal symptoms with COVID-19 and pancreatic enzyme defects were ignored in those trials, resulting in acute pancreatitis becoming underdiagnosed.

Most patients respond to initial conservative measures such as intravenous hydration, nothing per mouth, analgesics, gastric decompression, antispasmodic medications, and antibiotics.¹⁰ According to one study, maternal mortality ranges from 5 to 15% due to pancreatic necrosis and multi-organ failure. The majority of cases of acute pancreatitis resolve spontaneously, and inflammation subsides in 90% of patients within one week. Early intravenous fluid resuscitation offers macro- and microcirculatory assistance, which helps avoid severe complications, including pancreatic necrosis.²⁻⁴

In this case, the COVID-19 might be causative for acute pancreatitis because there was no evidence of gallstone in abdominal CT, even though she has high triglyceride and cholesterol that might lead to the formation of gallbladder stones. Both pregnancy and COVID-19 might play a role as causative factors of acute pancreatitis. This is supported by the fact that our blood culture showed no growth which may arise due to viral infection.¹² This study successfully found signs of acute pancreatitis in a COVID-19 patient which were rarely found. However, we were not able to specifically identify the cause of sepsis in this patient. The patient in this case had also been diagnosed with hyperlipidemia which increases her risk of getting acute pancreatitis more often during the third trimester and postpartum.

Conclusion

This report highlights the importance of considering SARS-CoV-2 as a new etiological agent of acute viral pancreatitis, especially in this ongoing pandemic. Further studies are needed to establish the actual prevalence and clinical significance of pancreatic injury in COVID-19 patients and underlying pathophysiological mechanisms of the association between COVID-19 and pancreatitis. This unusual presentation of acute pancreatitis in a postpartum woman with COVID-19 has shown us the importance of good problem analysis in early detection and prompt intervention to ensure a good prognosis.

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