Acute Pancreatitis may Occur in COVID-19 Patients with Clearance of SARS-CoV-2 in Lung: A Case Report

Hong Zhao

Zhejiang University School of Medicine First Affiliated Hospital

Junwei Su

Zhejiang University School of Medicine First Affiliated Hospital

Kaijin Xu

Zhejiang University School of Medicine First Affiliated Hospital

Yu Shi

Zhejiang University School of Medicine First Affiliated Hospital

Yunqing Qiu

Zhejiang University School of Medicine First Affiliated Hospital

Jifang Sheng (✉ jifang_sheng@zju.edu.cn)

the first affiliated hospital, zhejiang university, school of medicine <https://orcid.org/0000-0003-0732-1555>

Case report

Keywords: COVID-19, SARS-CoV-2, Clearance, Acute pancreatitis

Posted Date: August 24th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-62816/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is mostly causes lung damages, but also lead to gastroenterology injury. SARS-CoV-2 - associated acute pancreatitis has been reported, however, clearance of SARS-CoV-2 and the pancreatitis was not clear.

Case presentation: A 62 year old diabetic female patient suffer from coronavirus diseases (COVID-19) and detection of SARS-CoV-2 turned negative on day 11 and day 12 in sputum. Two days latter, the patient was diagnosed with acute pancreatitis. Through the support treatment, the patient got better and discharged from our hospital 18 days later.

Conclusions: Our case provided an initial view of SARS-CoV-2 infection with acute pancreatitis and the acute pancreatitis may occur in COVID-19 patients with clearance of SARS-CoV-2 in lung.

Background

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), one of the recently emerging deadly coronavirus virus, have been reported to be associated with coronavirus diseases (COVID-19)[1]. SARS-CoV-2 is mostly causes lung damages, but also lead to other systems and tissues injury[1]. Gastroenterology involvement might manifest as asymptomatic bellyache, nausea, emesia, diarrhea and liver enzymes elevation[1, 2]. SARS-CoV-2 - associated acute pancreatitis has been reported, however, clearance of SARS-CoV-2 and the pancreatitis was not clear[3]. We present a case of SARS-COV-2 infection in a diabetes mellitus patient causing acute pancreatitis at late disease presentation.

Case Presentation

On February 16th 2020 (day 1), a 62-year-old female sought medical care for chief complains of fever, cough and fatigue for seven days and breath shortness for one day. Considering her travelling history to Egypt ten days ago with her husband, chest computed tomography (CT) was done and showed pneumonia in both low lobes, meanwhile, throat swab was collected with positive SARS-CoV-2 nucleic acid detection. Her husband was also diagnosed of SARS-CoV-2 infection subsequently. This patient had comorbidities of hypertension and type II diabetes for ten years. She was overweight with BMI of 26.67 kg/m^2 . As diagnosed of COVID-19, oral antiviral treatment (Arbidol 200 mg tid with Ritonavir boosted Lopinavir(LPV/r) 500 mg q12h), intravenous methylprednisolone 40 mg qd and intravenous human immunoglobulin 20 g qd were given. Her symptoms deteriorated at the first week, and stabilized during the second week. She was afebrile on day 11. Detection of SARS-CoV-2 turned negative on day 11 and day 12 in sputum and stool respectively. Repeated chest CT on day 13 showed appearently aborbtion of ground-glass opacities (GGO) and consolidations.

On day 14, she complained of abdominal distension and epigastric pain after breakfast (mainly porridge). Physical examination of her abdomen revealed mild tenderness without rebound tenderness. Serumamylase was found to be elevated to 352 mmol/L (normal range: 35–135 mmol/L) five hours

later with normal urine amylase. Hypocalcemia (2.05 mmol/L) was also found in this patient. Electrocardiograph showed no abnormality and abdominal ultrasound revealed fatty liver with no change on pancreas. Further abdomen CT was processed and showed exudative changes in pancreatic uncinate process and infiltration along the perivascular (Fig. 1). Her fasting blood-glucose ranged from 7.4–9.4 mmol/L and postprandial blood-glucose ranged from 9.4–25.8 mmol/L with normal blood ketone body. 18U insulin glargine was subcutaneous injected before sleep and 12-12-14 U insulin aspart was given before each meal. As diagnosed of acute mild pancreatitis, fasting, somatostatin and proton pump inhibitor were prescribed. Abdominal symptoms released and retested serumamylase decreased to 84 mmol/L on day 16 with other blood tests showed increased triglyceride (from 0.76 mmol/L on admission to 3.30 mmol/L). Little fat-free diet was allowed while abdominal pain reoccurred with serumamylase increased to 231 mmol/L. Fasting was maintained till this patient was transferred to local hospital on day 18. A phone-call follow-up was done on day 21, this patient had started to refeed again and no abdominal symptoms occurred.

Discussion And Conclusions

Even through pancreas had been reported to be one of the potential target organs of SARS-CoV-2, few clinical cases about SARS-CoV-2-induced pancreas injury had been reported and the underlying mechanism was still unclear[3, 4]. This study described incidence of acute pancreatitis in a patient with COVID-19 to grab attention of physicians on SARS-CoV-2-associated pancreas injury in COVID-19 patients with complex comorbidities.

As demonstrated, alcohol misuse, gluttony and gallstone were main etiology of acute pancreatitis[5] while in this case, these inducements were all excluded based on medical history and clinical detections. It had been approved in HIV patients that LPV/r increased incidence of hypertriglyceridemia and hyperlipidemia which was associated with acute pancreatitis[6]. However, direct connection of acute pancreatitis with ritonavir-induced hypertriglyceridemia was only illustrated in few cases[7]. Meanwhile, COVID-19 patients with hypertriglyceridemia was not seen clinical acute pancreatitis and in this case, hypertriglyceridemia occurred after incidence of acute pancreatitis[8].

Previous studies revealed that patients with SARS-CoV infection were at high risk of developing injury pancreas causes acute diabetes and pancreatitis [9]. SARS-CoV-2, similar with SARS-Cov, one of the β coronavirus virus, was reported to enter organs by binding with angiotensin-converting enzyme 2 (ACE2) [9, 10]. And ACE2 was presented in kidney, liver, adipose tissue and pancreas[10]. This may be one of the reasons explaining that SARS-induced pancreas injury contributed to acute diabetes and pancreatitis[9, 10]. The acute pancreatitis appeared after the RNA of SARS-CoV-2 turned negative in sputum, which means that acute pancreatitis may occur in COVID-19 patients with clearance of SARS-CoV-2 in lung.

In conclusion, our case provided an initial view of SARS-CoV-2 infection with acute pancreatitis and the acute pancreatitis may occur in COVID-19 patients with clearance of SARS-CoV-2 in lung. However, since lacking of pathological biopsy in this case, it is still unclear about the direction relationship between

SARS-CoV-2 infection with acute pancreatitis, indicating that further researches should be done for our better understanding of coronavirus induced pancreatitis.

Abbreviations

ACE2: angiotensin-converting enzyme 2. COVID-19: coronavirus diseases. CT: computed tomography. GGO: ground-glass opacities. SARS-CoV-2: Severe acute respiratory syndrome coronavirus 2.

Declarations

Ethics approval and consent to participate:

The principles of Helsinki Declaration was fit for the study and the ethics committee of the First Affiliated Hospital of Zhejiang University School of Medicine was approved this study (No: 2020-IIT-39).

Consent for publication:

Consents from all participants were signed.

Availability of data and materials:

Not applicable.

Competing interests:

The authors declare that they have no competing interests.

Funding:

This work was supported by The National Natural Science Foundation of China (Grant No. 81971982), Zhejiang Provincial Science and Technology Department's key R & D plan emergency project (Grant No. 2020C03123) and Zhejiang University special scientific research fund for COVID-19 prevention and control.

Authors' contributions:

HZ and JS collected the data. JS and YQ conceived and designed the experiments. KX analyzed the patient data. HZ and YS was a major contributor in writing the manuscript. All authors read and approved the final manuscript.

Acknowledgements:

We would like to thank all the participants recruited in this study. And We thank International Science Editing (<http://www.internationalscienceediting.com>) for editing this manuscript.

Footnotes:

None.

References

1. Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med*. 2020; 382:1708-1720.
2. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China. *JAMA*. 2020; 323:1061-1069.
3. Hadi A, Werge M, Kristiansen KT, Pedersen UG, Karstensen JG, Novovic S, et al. Coronavirus Disease-19 (COVID-19) associated with severe acute pancreatitis: Case report on three family members. *Pancreatology*. 2020; 20:665-667.
4. Liu F, Long X, Zhang B, Zhang W, Chen X, Zhang Z. ACE2 Expression in Pancreas May Cause Pancreatic Damage After SARS-CoV-2 Infection. *Clinical gastroenterology and hepatology : the official clinical practice journal of the American Gastroenterological Association*. 2020; 18:2128-2130.e2122.
5. Hines OJ, Pandol SJ. Management of severe acute pancreatitis. *BMJ*. 2019; 367:l6227.
6. Valerio L, Fontas E, Pradier C, Lavrut T, Garraffo R, Dunais B, et al. Lopinavir/ritonavir combination and total/HDL cholesterol ratio. *The Journal of infection*. 2005; 50:229-235.
7. Athyros VG, Giouleme OI, Nikolaidis NL, Vasiliadis TV, Bouloukos VI, Kontopoulos AG, et al. Long-term Follow-up of Patients With Acute Hypertriglyceridemia-Induced Pancreatitis. *Journal of Clinical Gastroenterology*. 2002; 34:472-475.
8. McNabb-Baltar J, Jin DX, Grover AS, Redd WD, Zhou JC, Hathorn KE, et al. Lipase Elevation in Patients With COVID-19. *The American journal of gastroenterology*. 2020; 115:1286-1288.
9. Yang J-K, Lin S-S, Ji X-J, Guo L-M. Binding of SARS coronavirus to its receptor damages islets and causes acute diabetes. *Acta Diabetol*. 2010; 47:193-199.
10. Letko M, Marzi A, Munster V. Functional assessment of cell entry and receptor usage for SARS-CoV-2 and other lineage B betacoronaviruses. *Nat Microbiol*. 2020; 5:562-569.

Figures

Figure 1

The abdominal CT scan findings in the 62 years female with COVID-19. As shown by the arrow: abdomen CT was processed and showed exudative changes in pancreatic uncinate process and infiltration along the perivascular.