

Acute Pancreatitis as Clinical Presentation of COVID-19 in a Patient With HIV Infection – a Case Report.

Justyna D. Kowalska

Medical University of Warsaw: Warszawski Uniwersytet Medyczny

Carlo Bieńkowski (✉ carlo.bienkowski@gmail.com)

Medical University of Warsaw: Warszawski Uniwersytet Medyczny <https://orcid.org/0000-0002-6488-4576>

Beata Wojtycha-Kwaśnica

SP ZOZ Wojewodzki Szpital Zakazny: Wojewodzki Szpital Zakazny

Paweł Uliczny

SP ZOZ Wojewodzki Szpital Zakazny: Wojewodzki Szpital Zakazny

Andrzej Horban

Medical University of Warsaw: Warszawski Uniwersytet Medyczny

Case report

Keywords: SARS-CoV-2, COVID-19, HIV, pancreatitis, gastrointestinal symptoms

Posted Date: March 15th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-290298/v1>

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

[Read Full License](#)

Version of Record: A version of this preprint was published at Gastroenterology Report on January 1st, 2022. See the published version at <https://doi.org/10.1093/gastro/goac003>.

Abstract

Background:

Acute pancreatitis may be caused by many factors such as: viral infections, drugs, alcohol, autoimmune response. SARS-CoV-2 virus requires an angiotensin-converting enzyme 2 (ACE2) transmembrane protein in order to enter the cell. As ACE2 receptors are over 100 times more common in gastrointestinal (GI) tract than in respiratory tract and many SARS-CoV-2 infected patients present GI symptoms.

Case presentation:

A 26-year-old, HIV-positive man on effective combined antiretroviral therapy with normal CD4+ lymphocyte count level was consulted at the Emergency Department (ER) with mild COVID-19 symptoms, and referred for home isolation. Two weeks later and three weeks from first symptoms, he returned to ER with a three-day history of nausea and pain in the upper abdomen. He had no symptoms of respiratory tract infection, normal peripheral blood oxygenation and chest X-ray. He was admitted to the hospital and diagnosed with acute pancreatitis basing on the Revised Atlanta Classification. After discharge the patient continued to have food intolerance and abdominal discomfort for several weeks, but COVID-19 did not affect his HIV course. Three months post COVID-19 his anti-SARS-CoV-2 IgM and IgG antibodies were negative, and low level of 2 AU/mL of anti-S-RBD IgG antibodies was detected.

Conclusions:

SARS-CoV-2 infection is the most likely cause of pancreatitis in the presented patient. Several other case reports were published however none in HIV-positive patient. Therefore in COVID-19 patients serum amylase and lipase levels should be included into routine laboratory tests' panel. Abdominal ultrasound and CECT should be considered as diagnostic tool in patients with abnormal laboratory findings or clinical manifestation suggesting GI tract involvement.

Background

SARS-CoV-2 occurs mostly as respiratory tract infections, however a substantial proportion of patients presents with other symptoms (1). In order to enter the cell SARS-CoV-2 virus requires an angiotensin-converting enzyme 2 (ACE2) transmembrane protein, also called ACE2 receptor. ACE2 receptors are over 100 times more common in gastrointestinal (GI) tract than in respiratory tract and many SARS-CoV-2 infected patients present GI symptoms (2). In the course of COVID-19 cytopathogenic T cells and activated monocytes may enter the GI tract in the same way as pulmonary circulation and initiate the inflammation leading to organ injury and immune disorder. Pancreatic cells present high expression of ACE2 receptors and this creates potential for pancreatic injury in the course of COVID-19 (3). However up to date only few COVID-19 related pancreatitis were reported and none in HIV-positive person (4, 5). As of today the incidence of pancreatitis and its future clinical implications in this specific subgroup of patients remain unknown.

Case Presentation

A 26-year-old man infected with human immunodeficiency virus (HIV) through having sex with men (MSM) in 2016 was consulted in the Emergency Department (ER) of the Hospital for Infectious Diseases in Warsaw due to five day history of loss of smell, dry cough and myalgia, and two day history of dyspnea. In anamnesis the patient suffered from asthma and was treated with fluticasone and salmeterol inhalations. He was on stable antiretroviral treatment with dolutegravir, tenofovir alafenamide and emtricitabine. His most recent lymphocyte CD4 + cell count was 1610 cells/mm³, CD4 + percentage 55%, HIV viral load (VL) undetectable, both hepatitis B and C infections were excluded. In relation to a lifestyle he had a well-balanced diet, he was a non-smoker, reported occasional use of alcohol and denied any use of illicit psychoactive substances. However a week before symptoms onset he met with few friends and had a cannabis cookie.

No significant abnormalities were present on physical examination. A nasal swab was performed and reverse transcriptase–polymerase-chain-reaction (RT-PCR) assay confirmed SARS-CoV-2 infection. He was diagnosed with mild COVID-19 and referred for home isolation.

Two weeks later, and three weeks from first symptoms, he returned to ER with a three-day history of pain in the upper abdomen and nausea. He had no symptoms of respiratory tract infection and his peripheral blood oxygenation was SaO₂ 96%. He was admitted to the hospital and diagnosed with acute pancreatitis basing on serum lipase 5855 U/l [Norm: 23–300 U/L] and serum amylase 350 U/L [Norm: 30–110 U/L]. His C-reactive protein (CRP) level was 53 ng/mL [Norm: <10 ng/mL], d-dimers 892 ng/mL [Norm: <500 ng/mL] and white blood cell count 10 100/mm³ (with 53.2% of neutrophils). His chest X-ray was normal. The abdominal ultrasound examination showed normal size, slightly nonhomogeneous pancreas without any focal lesion and fluid collection. Pancreatic duct wasn't dilated. There were no changes in the other organs and no ascitic fluid.

On contrast-enhanced computed tomography (CECT) the pancreas was not enlarged, without focal lesion, with subtle obliteration of the lobar structure, with gentle homogeneous enhancement. Pancreatic duct was not dilated. Infiltration of peripancreatic fat was present. Several mesenteric and peripancreatic lymph nodes were enlarged up to 6 mm in short axis. Other organs without any changes (Fig. 1).

During hospitalization the patient was tested twice for SARS-CoV-2 RT-PCR from nasopharyngeal swab, both results were negative. The patient was referred home and remained under control at the outpatients' clinic.

On the first follow-up visit on May 2020 in HIV clinic the patient reported sustained pain in the upper abdomen and problems with tolerating normal food. His serum lipase level was 1729 U/L, CRP was 32 ng/mL and lymphocytes CD4 + count dropped to 987 cells/mm³ with 55%, 1.26 CD4+/CD8 + ratio. He had normal level of IL-6, ferritin and d-dimers. HIV viral load remained undetectable (HIV RNA assay Abbott m2000).

On the next visit on June 2020 follow-up testing revealed undetectable HIV VL and lymphocytes CD4 + count increase to 1102 cells/mm³ (55%), 1.3 CD4+/CD8 + ratio. The most recent follow-up in February 2021 laboratory tests displayed: 1404 CD4 + cells/mm³ (60%), 1.61 CD4+/CD8 + ratio. undetectable HIV VL, lipase level 21 U/L. Serological testing with MAGNUMI system showed negative anti-SARS-CoV-2 IgM and IgG antibodies and low level anti-SRBD IgG antibodies of 2 AU/mL (positive cut off of 1 AU/mL).

Discussion And Conclusions

According to the Revised Atlanta Classification the diagnosis of acute pancreatitis can be established when as at least 2 of 3 criteria are met: lipase or amylase level that is three times the upper limit of normal, abdominal pain that is consistent with pancreatitis and abdominal imaging consistent with acute pancreatitis (6). Our patient has met all the diagnostic criteria; therefore we were able to diagnose him with acute pancreatitis. At the same time this patient had no other risk factors for pancreatitis than SARS-CoV-2 infection.

Gastrointestinal symptoms such as nausea, vomiting and diarrhea are common among SARS-CoV-2 infected persons, however little is known about the factual GI tract involvement in the course of the disease. Up to 16% of patients with severe SARS-CoV-2 infection have raised serum amylase and lipase levels with 7% displaying significant pancreatic changes on CT (3).

In retrospective analyses by Han et al. more than half of patients hospitalized in Union Hospital, Tongji Medical College (Wuhan, China) with mild COVID-19 had both respiratory and GI symptoms and over 20% had only GI symptoms. Patients with GI symptoms were more likely to report later for medical care. Our case presents a patient with both respiratory and GI symptoms, the latter one however occurred three weeks after first symptoms. Nevertheless some case reports indicate that GI symptoms may be present before respiratory symptoms (7).

It is currently unknown which factors may prone to GI presentation of COVID-19. Taking into account high lymphocyte count and full viral suppression in presented patients, HIV infection is rather unlikely to play a role in the course of COVID-19. According to one case report acute pancreatitis presentation was developed by two out of three family members suggesting that genetical factors may play a role (8).

In a study by Tian et al. up to 50% of faecal samples were RT-PCR positive, two to five days later than sputum PCR. Also faecal RT-PCRs persisted positive after sputum RT-PCRs were negative in up to 80% patients, with the time span of 1–11 days (9). Although antiretroviral drug-induced pancreatitis can be observed in HIV-positive patients, it is highly unlikely in presented case as the patient was on well tolerated cART since 2016 (10). Whether and to what extent HIV remains a factor in the course and clinical presentation of SARS-CoV-2 infection remains unknown (11).

In the letters to the editor Peluso et al. discussed the HIV VL increase in the course of COVID-19 in HIV-positive patients. Their analysis included 12 patients and revealed that in 10 patients with SARS-CoV-2/HIV coinfection the VL raised, however there was no statistical significance between COVID-19-positive

and COVID-19-negative participants. In our case report the patient had constantly undetectable HIV VL both during the course of the disease and follow-up visits (12).

Akkus et al. retrospectively investigated a group of 127 patients with increased lipase level in the course of COVID-19. The study revealed that the risk of developing elevated pancreatic enzymes is high in the patients with SARS-CoV-2 infection, especially in those with preexisting diabetes (13).

Some recent reports suggest that HIV positive patients may experience HIV viral load blips, however we did not observe this in our patient. Although his CD4 + cell count dropped, it was anyway within the normal range with high CD4+/CD8 + ratio and stable CD4 + percentage (12).

To conclude, the symptomatology of COVID-19 is very broad and may be related to different organs' injury. From pathophysiological perspective GI involvement is plausible, but rarely diagnosed in clinical practice. Whether rare GI involvement is related to focusing on respiratory symptoms and underdiagnosis or clinically factual remain unclear. Therefore in COVID-19 cases serum amylase and lipase levels should be considered standard laboratory tests and included into routine laboratory tests' panel. Abdominal ultrasound and CECT should be considered as diagnostic tool in patients with abnormal laboratory findings or clinical manifestation suggesting GI tract involvement.

Abbreviations

ACE2 – angiotensin-converting enzyme 2

CRP – c-reactive protein

ER – emergency department

GI – gastrointestinal

HIV – human immunodeficiency virus

MSM – men having sex with men

VL – viral load

Declarations

Ethics approval and consent to participate were obtained.

Consent for publication: all co-authors consent for this publication.

Availability of data and materials: 'Not applicable'

Competing interests: all co-authors declare no conflict of interest.

Funding: no funding was received for this work.

Authors' contributions: all co-authors contributed equally to this work.

Acknowledgements: 'Not applicable'

References

1. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020;395(10223):497-506.
2. Hamming I, Timens W, Bulthuis ML, Lely AT, Navis G, van Goor H. Tissue distribution of ACE2 protein, the functional receptor for SARS coronavirus. A first step in understanding SARS pathogenesis. *J Pathol*. 2004;203(2):631-7.
3. Liu F, Long X, Zou W, Fang M, Wu W, Li W, et al. Highly ACE2 Expression in Pancreas May Cause Pancreas Damage After SARS-CoV-2 Infection. *medRxiv*. 2020:2020.02.28.20029181.
4. Alves AM, Yvamoto EY, Marzinotto MAN, Teixeira ACS, Carrilho FJ. SARS-CoV-2 leading to acute pancreatitis: an unusual presentation. *Braz J Infect Dis*. 2020;24(6):561-4.
5. Kandasamy S. An unusual presentation of COVID-19: Acute pancreatitis. *Ann Hepatobiliary Pancreat Surg*. 2020;24(4):539-41.
6. Foster BR, Jensen KK, Bakis G, Shaaban AM, Coakley FV. Revised Atlanta Classification for Acute Pancreatitis: A Pictorial Essay. *Radiographics*. 2016;36(3):675-87.
7. Pazgan-Simon M, Rorat M, Buczyńska I, Zińczuk A, Simon K. Gastrointestinal symptoms as the first, atypical indication of severe acute respiratory syndrome coronavirus 2 infection. *Pol Arch Intern Med*. 2020;130(4):338-9.
8. 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(4):665-7.
9. Tian Y, Rong L, Nian W, He Y. Review article: gastrointestinal features in COVID-19 and the possibility of faecal transmission. *Aliment Pharmacol Ther*. 2020;51(9):843-51.
10. Oliveira NM, Ferreira FA, Yonamine RY, Chehter EZ. Antiretroviral drugs and acute pancreatitis in HIV/AIDS patients: is there any association? A literature review. *Einstein (Sao Paulo)*. 2014;12(1):112-9.
11. Kowalska JD, Kase K, Vassilenko A, Harxhi A, Lakatos B, Lukić GD, et al. The characteristics of HIV-positive patients with mild/asymptomatic and moderate/severe course of COVID-19 disease-A report from Central and Eastern Europe. *Int J Infect Dis*. 2020;104:293-6.
12. Peluso MJ, Bakkour S, Busch MP, Deeks SG, Henrich TJ. A High Percentage of People With Human Immunodeficiency Virus (HIV) on Antiretroviral Therapy Experience Detectable Low-Level Plasma HIV-1 RNA Following Coronavirus Disease 2019 (COVID-19). *Clinical Infectious Diseases*. 2020.

13. Akkus C, Yilmaz H, Mizrak S, Adibelli Z, Akdas O, Duran C. Development of pancreatic injuries in the course of COVID-19. Acta Gastroenterol Belg. 2020;83(4):585-92.

Figures

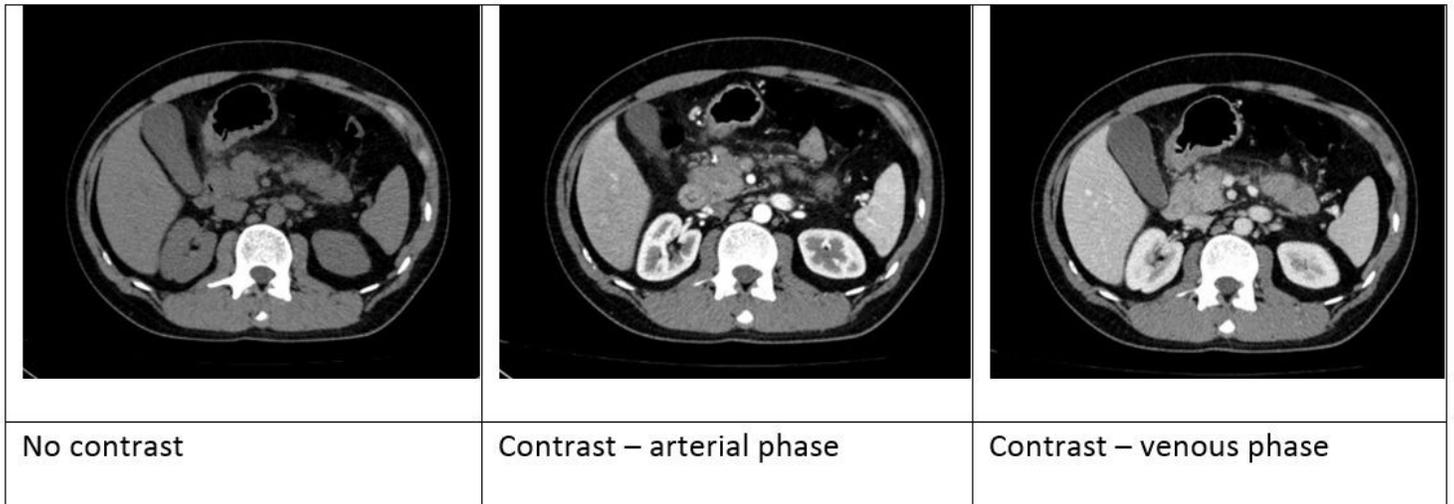


Figure 1

Abdominal contrast-enhanced computed tomography (CECT)