

# What Do We Know So Far About Gastrointestinal and Liver Injuries Induced by SARS-CoV-2 Virus?

Weibiao Cao

The coronavirus disease 2019 (COVID-19) became a global pandemic in March, 2020 and is caused by infection with the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1]. Although the major organ affected by SARS-CoV-2 is lung, gastrointestinal (GI) tract and liver may also be affected and GI symptoms may be the initial presenting symptoms.

The most common GI symptoms include nausea, vomiting, diarrhea abdominal pain and anorexia [2, 3]. The prevalence of nausea and vomiting is 3-7%, diarrhea 8-13%, abdominal pain 3% and anorexia 17% [2]. Interestingly, the prevalence of these symptoms in China is different from non-China regions. In China, the prevalence of nausea and vomiting is 7% and the prevalence of diarrhea is 8%, whereas in non-China regions, the prevalence of nausea and vomiting is 3% and the prevalence of diarrhea is 13%. Most frequently, GI symptoms are associated with other upper respiratory infection symptoms. However, in some cases, isolated GI symptoms may appear before the development of upper respiratory infection symptoms.

SARS-CoV-2 was identified in the GI epithelial cells and stool of COVID-19 patients [4-6], indicating the possibility of fecal transmission. Angiotensin-converting enzyme 2 (ACE2) is the entry receptor for SARS-CoV-2. ACE2 is found in the esophageal epithelium, gastric mucosa, enterocytes and colonocytes [4, 7]. In COVID-19 patients, the GI histological examination is unremarkable and may show occasional lymphoplasmacytic inflammation and edema in the esophageal mucosa and gastric lamina propria [8].

COVID-19 patients also have abnormal liver function tests including increased aspartate transaminase (AST) (24%), increased alanine aminotransferase (ALT) (25%) and elevated bilirubin (3%) [2]. Histological examination of the liver from autopsy studies showed mild and non-specific findings, including mild lobular and portal lymphocytic infiltration, steatosis and sinusoidal dilatation [9, 10]. It is not clear whether the liver injury is caused by the direct virus-mediated injury or due to secondary effects from severe disease [8], although the

latter is favored [11].

In conclusion, during this pandemic, gastroenterologists should consider COVID-19 infection when a patient presents with GI symptoms, although isolated GI symptoms without respiratory symptoms are uncommon. Even though SARS-CoV-2 is mainly transmitted through respiratory droplets, stool may also be a source of SARS-CoV-2 transmission.

## Acknowledgments

None to declare.

## Financial Disclosure

None to declare.

## Conflict of Interest

None to declare.

## Data Availability

The author declares that data supporting the findings of this study are available within the article.

## References

1. Cha MH, Regueiro M, Sandhu DS. Gastrointestinal and hepatic manifestations of COVID-19: A comprehensive review. *World J Gastroenterol.* 2020;26(19):2323-2332.
2. Dong ZY, Xiang BJ, Jiang M, Sun MJ, Dai C. The prevalence of gastrointestinal symptoms, abnormal liver function, digestive system disease and liver disease in COVID-19 infection: a systematic review and meta-analysis. *J Clin Gastroenterol.* 2021;55(1):67-76.
3. Bilal M, Sawhney MS, Feuerstein JD. Coronavirus disease-2019: implications for the gastroenterologist. *Curr Opin Gastroenterol.* 2021;37(1):23-29.
4. Gu J, Han B, Wang J. COVID-19: gastrointestinal manifestations and potential fecal-oral transmission. *Gastroenterology.* 2020;158(6):1518-1519.

Manuscript submitted December 9, 2020, accepted December 10, 2020  
Published online December 23, 2020

Department of Pathology & Medicine, The Warren Alpert Medical School of Brown University & Rhode Island Hospital, 593 Eddy St, APC12, Providence, RI 02903, USA. Email: wcao@hotmail.com

doi: <https://doi.org/10.14740/gr1350>

5. Xiao F, Sun J, Xu Y, Li F, Huang X, Li H, Zhao J, et al. Infectious SARS-CoV-2 in feces of patient with severe COVID-19. *Emerg Infect Dis*. 2020;26(8):1920-1922.
6. Wang W, Xu Y, Gao R, Lu R, Han K, Wu G, Tan W. Detection of SARS-CoV-2 in different types of clinical specimens. *JAMA*. 2020;323(18):1843-1844.
7. Xiao F, Tang M, Zheng X, Liu Y, Li X, Shan H. Evidence for Gastrointestinal Infection of SARS-CoV-2. *Gastroenterology*. 2020;158(6):1831-1833 e1833.
8. Al Nemer A. Histopathologic and autopsy findings in patients diagnosed with coronavirus disease 2019 (COVID-19): what we know so far based on correlation with clinical, morphologic and pathobiological aspects. *Adv Anat Pathol*. 2020;27(6):363-370.
9. Barton LM, Duval EJ, Stroberg E, Ghosh S, Mukhopadhyay S. COVID-19 Autopsies, Oklahoma, USA. *Am J Clin Pathol*. 2020;153(6):725-733.
10. Xu Z, Shi L, Wang Y, Zhang J, Huang L, Zhang C, Liu S, et al. Pathological findings of COVID-19 associated with acute respiratory distress syndrome. *Lancet Respir Med*. 2020;8(4):420-422.
11. Sultan S, Altayar O, Siddique SM, Davitkov P, Feuerstein JD, Lim JK, Falck-Ytter Y, et al. AGA institute rapid review of the gastrointestinal and liver manifestations of COVID-19, meta-analysis of international data, and recommendations for the consultative management of patients with COVID-19. *Gastroenterology*. 2020;159(1):320-334 e327.