DOI: 10.1002/jmv.26265

LETTER TO THE EDITOR

JOURNAL OF MEDICAL VIROLOGY WILEY

Fecal-oral transmission of COVID-19: Could hypochlorhydria play a role?

Dear Editor,

Coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), which emerged in Wuhan, China in 2019.[1] Respiratory symptoms remain the most common clinical manifestations of COVID-19. However, nonrespiratory symptoms are increasingly being recognized. Gastrointestinal (GI) symptoms such as anorexia, nausea, vomiting, diarrhea, and abdominal pain are noted in COVID-19 patients either alone or in association with respiratory manifestations.[2] Stool viral RNA can be detected in up to 50% in patients with diarrhea.[3]

Stool shedding of SARS-CoV-2 RNA can be due to various reasons. SARS-CoV-2 gains entry to host cells (nose, eyes, mouth) via angiotensin-converting enzyme-2 (ACE-2). GI tract has variable levels of ACE-2, especially in esophagus, stomach, ileum, and colon.[4] SARS-CoV-2 enters the stomach, if the virus escapes gastric defenses it could directly infect intestinal enterocytes and cause fecal shedding.[5] Furthermore, feces can be positive for viral RNA for an extended period (up to 11 days after onset of symptoms). This raises the possibility of the fecal-oral route of transmission of SARS-CoV-2.[6-8]

Low gastric acid may allow the virus to bypass the stomach and reach small intestine enterocytes.[1,3,5] Hypochlorhydria is quite common in the elderly,[9] a particularly high-risk group for COVID-19. The resultant infection could contribute to fecal shedding of the virus and stool viral RNA positivity. Subsequently, there could be a period in which the patient is virtually symptom-free and testing negative by conventional methods.[10] The critical question is whether this viral RNA represents an infection hazard. Recent research suggests that it might.[11]

Given these gaps in our knowledge, we propose the following hypothesis: hypochlorhydria may cause a loss of the protective effect of acidic gastric secretions. After the virus enters the small intestine, a direct cytopathic effect on the enterocytes can, at least in part, explain nausea, loss of appetite. This can often be overlooked by the infected individual. Viral replication continues to occur, and it can spread to different organs via the portal circulation, showing only later its life-threatening respiratory effects. Fecal shedding can be explained due to ongoing enterocyte infection, and widespread stool testing might offer additional insights about the incubation period. This route of infection may explain the variability in the incubation period, ranging from 2 to 14 days or longer.

Understanding fecal-oral shedding is vital to assess SARS-CoV-2 at early stages and can be used as a tool to assess the variability in the incubation period in these individuals. Furthermore, it can offer insights into the mechanism of spread from infected to noninfected individuals. Hypochlorhydria can interfere with the protective effects of gastric acid on SARS-CoV-2, especially in the vulnerable populations. Hence, stool sample testing may be critical for detecting SARS-CoV-2 early and late in suspected COVID-19 cases.

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