



Gastrointestinal Manifestations of COVID- 19

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ABSTRACT

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has brought unpredictable challenges to the whole world by causing Coronavirus disease 2019 (COVID-19). Although respiratory tract manifestations are the most commonly reported symptoms in COVID-19, early studies reported a low incidence of typical gastrointestinal (GI) symptoms, such as diarrhea, nausea, vomiting, and even liver dysfunctions. However, The prevalence and prognosis of Gastrointestinal system involvement, including gastrointestinal symptoms and liver injury, remains mostly unknown in patients with COVID-19. We aimed to review the effects of COVID-19 on the GI system. Anorexia was the most frequent digestive symptom in adults (39.9%-50.2%), and diarrhea was the most frequent symptom in both adults and children. Moreover, vomiting was more common in children. Approximately nine percent of adult patients showed vomiting. Almost 36% of children encounter vomiting; nausea is considered for 15% of children. Gastrointestinal bleeding was presented in more than ten percent of children, while abdominal pain was more frequent in severely ill patients.

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Introduction

Coronaviruses are known to affect both humans and animals. A new type of coronaviruses was found in Wuhan, China late 2019 and spread very rapidly all around the world. In March 2020, the World Health Organization termed the disease caused by this virus COVID-19 (Coronavirus disease 2019) and announced the outbreak as a pandemic (1,2).

As of September 2020, more than 37 million people have contracted the virus worldwide. The pathogen of COVID-19 was named acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by the International Committee on Taxonomy of Viruses (3,4).

According to genetic studies, the virus that leads to COVID-19 belongs to the betacoronavirus family. Like other viruses in this family, it inter acts

with the angiotensin-converting enzyme 2 (ACE2) receptor to intrude into the cells.

The mode and risk of transmission of the virus are not still fully clear. In Wuhan, epidemiologic research at the origin of the outbreak reported the relation of the virus with a seafood market, where most initial patients frequented.

Nevertheless, after the spread of the disease through the world, person-to-person transmission became the primary mode of transmission, which is assumed to occur in close-range contact, mainly through respiratory droplets. Virus transmission occurs when droplets of an infected person, mainly due to cough or sneeze, reach the mucous membranes of another person's mouth, nose, or eyes. The infection transmission may also transpire indirectly when some

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one touches an infected surface then touches her mouth or eyes. Droplets do not usually travel longer than six feet (about two meters) (5,7).

SARS-CoV-2 ribonucleic acid (RNA) has also been detected in blood, yet the likelihood of bloodborne transmission through blood products or needlesticks is believed to be low. Recent studies have also reported the presence of SARS-CoV-2 in non-respiratory specimens, such as blood, stool, ocular secretions, and semen; however, spreading through these routes have not been confirmed yet (8,9,10).

Incubation period

The incubation time for COVID-19 is generally up to 14 days after exposure, while most cases present symptoms 4 to 5 days after exposure (11,13).

In a research work done in China on 1099 patients with confirmed COVID-19, the average incubation period was found to be four days [12].

In another study on 181 confirmed cases in China with a known source of exposure, symptoms developed in around five days (14).

Initial presentation

Pneumonia is perceived as the most common infection feature, represented by fever in 43 percent, cough in 50 percent, shortness of breath in 29 percent, and illustrated by diffuse infiltration of both lungs in chest X-ray (15,17).

However, other symptoms, including headache in 34 percent, myalgias in 36 percent, and smell or taste disorders in less than 10 percent, are prevalent (13).

Literature review

Although COVID-19 patients typically present with respiratory complications, gastrointestinal symptoms, including nausea and diarrhea, have also been reported in some patients [15–19]. In several studies regarding gastrointestinal symptoms in COVID-19 patients, the main presentations were diarrhea, nausea/vomiting, and abdominal pain.

Various reports have recently discussed the presence of SARS-CoV-2 RNA in stool specimens, even after the viral RNA became undetectable in upper-respiratory samples [8,9]. The live virus has also been cultured from stool in rare cases (6,7)(10).

Unanimously, all this research implies that SARS-CoV-2 may affect the gastrointestinal tract and replicate there. In this article, we review the main gastrointestinal features of the disease.

In a cohort study in Hong Kong, 15 COVID-19 patients out of 59 presented gastrointestinal (GI)

symptoms. The presence of the RNA molecules of the virus in the patient's stool was tested, and 48% had positive results. In some patients, the stool result remained positive even after the respiratory samples became negative. This study recommended that health care workers should take extra precautions during sampling from GI secretion and conducting endoscopic procedures in COVID-19 patients (8).

Amongst COVID-19 patients, a wide range of GI symptoms have been reported. A recent research work in China confirmed that more than 80% of the patients experienced digestive symptoms to some extent, including diarrhea, diminished appetite, nausea, vomiting, abdominal pain, and gastrointestinal bleeding during their hospitalization (20,21).

The first articles about the clinical aspects of COVID-19 declared that three percent of patients had experienced diarrhea during their hospitalization. Regarding the gastrointestinal symptoms, according to recent articles (21–26), anorexia was introduced as the most prevalent GI symptom in adults, while diarrhea was the most common symptom in general. Vomiting was more frequent in children; approximately, 9% of adult patients presented vomiting, compared to 36% in children. Nausea was reported in 15% of patients, and gastrointestinal bleeding occurred in 9%. Abdominal pain was more frequent in patients with severe symptoms

According to some studies, only a few patients experienced diarrhea and vomiting without having a fever and cough. In one of these studies conducted at Wuhan University, China (29), they stated that only nine adult patients out of 1099 with a confirmed test of COVID-19 were admitted with GI symptoms. Throughout their hospitalization, 40% of patients did not show any respiratory symptoms or fever. In contrast, 60% of patients developed a fever throughout their hospitalization. In addition, 66% of patients were referred to the gastroenterology clinic (29).

In another study, patients were admitted with abdominal symptoms to the surgery department. Around 70 % of patients were staff members, and 30% were hospitalized patients. One patient was screened for SARS-CoV-2 infection after developing a fever, and it was positive. All patients in the surgery ward developed symptoms, including GI symptoms and fever (30).

In another research in China, 204 patients, aged between 36 and 68 years and 50% male, were analyzed. Among them, 103 patients presented gastroenterology symptoms, such as anorexia (78% of cases), diarrhea (34%), vomiting (4%), and abdominal pain (1.9% of cases). In six cases,

the patients had solely GI manifestations. During hospitalization, the gastrointestinal symptoms became more severe. Patients with GI features also demonstrated a higher level of liver enzymes (27).

In another study performed in China, more than 60% of patients had GI symptoms, including diarrhea (24%), anorexia (17%), and nausea (17%).

They also tested the fecal samples of 65 COVID-19 confirmed patients for the presence of SARS-CoV-2, and the test was positive in more than 90% of patients. Moreover, the SARS-CoV-2 RNA was identified in different parts of the digestive system, such as in the esophagus, stomach, and intestine specimens in two patients with severe conditions (28).

Another research group in China studied children with confirmed COVID-19 (21).

The patients were between 6 months and 17 years old. Three out of 31 children had diarrhea initially, and one child presented only vomiting without other respiratory symptoms (21).

Furthermore, no respiratory symptoms were mentioned through hospitalization.

Diarrhea presented in different stages of the disease, at the beginning and before testing, or after the disease was confirmed, discussed in one study performed in China on 295 patients (19).

They observed diarrhea in 49.5% of patients, and 55.2% developed it after hospitalization and antiviral therapy. Only 22.2% of the patients had diarrhea before the disease being confirmed. Most patients experienced diarrhea in the first eight days (with a median of three days). The symptoms lasted around 5 days on average (between 1 and 14 days). Diarrhea occurred six times per day in patients, on average. In addition, 34% had a yellow-watery stool (31).

In another study (27), similar results were reported where all children experienced diarrhea as the first symptom, and 3 out of 31 children had diarrhea 4 times per day. They also tested the fecal specimens, and 6.9% of patients had abnormal results, implying viral diarrhea. Around 5% of patients were positive for leukocytes and 1.7% for occult (31).

In another study, it was indicated that among 206 patients with a mild COVID-19, 48 patients presented GI symptoms solely, 69 developed both GI and respiratory symptoms, and 89 patients had only respiratory symptoms (32).

More than 60% of both groups with GI symptoms presented with diarrhea, while 19.4% experienced diarrhea as an early symptom. It lasted from 1 to 14 days. Besides, 60% of patients experienced fever with GI symptoms. During hospitalization, a positive fecal test was more frequent

among those who had GI symptoms than in patients with respiratory symptoms (32).

Diarrhea is managed when it is symptomatic. Medications usually used to alleviate symptoms are dioctahedral montmorillonite powder and loperamide.

Probiotics and antispasmodics can play a role in treatment as well, as they can help to balance the microflora in the intestines and to decrease abdominal pain. Rehydration treatment is also required to manage the electrolyte balance (33).

Conclusions

Beside the repository system, the COVID-19 disease can affect the GI tract, and some patients with COVID-19 present GI system symptoms.

The GI system can also be a source of transmission of SARS-CoV-2, which indicates the importance of disease and symptom management.

Conflict of Interest

The authors declare no conflicts of interest.

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