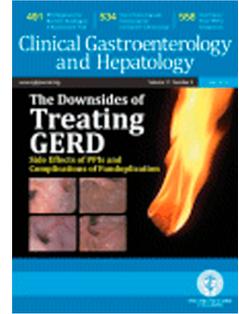


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Shihua Luo, Xiaochun Zhang, Haibo Xu



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## **Don't overlook digestive symptoms in patients with 2019 novel coronavirus disease (COVID-19)**

Shihua Luo, Xiaochun Zhang, Haibo Xu

Department of Radiology, Zhongnan Hospital of Wuhan University, Wuhan 430071, Hubei Province, China.

**Correspondence author:** Pro. Xiaochun Zhang, Department of Radiology, Zhongnan Hospital of Wuhan University, Wuhan 430071, Hubei Province, China. Tel: +8617720530369, +86-27-67811745, E-mail: zxcylkxyr@126.com.

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### **Introduction**

In late December 2019, a cluster of patients with pneumonia of unknown cause was epidemiologically linked to a seafood and wet animal wholesale market in Wuhan city, China. The causative pathogen was subsequently identified as the severe acute respiratory syndrome coronavirus 2(SARS-CoV-2)<sup>[1]</sup>. Over the course of the current pandemic, it became apparent that some patients can present with abdominal symptoms without fever or respiratory manifestations, and could be overlooked by health care providers.

We present a case series of hospitalized patients with SARS-CoV-2 infection whose initial symptoms were gastrointestinal. .

### **Methods**

This retrospective study was approved by the Medical Ethical Committee of Zhongnan Hospital of Wuhan University. We evaluated all 1141 cases of 2019 novel coronavirus disease(COVID-19) admitted to Zhongnan Hospital of Wuhan University from Jan 1 to Feb 20, 2020. Diagnosis of COVID-19 pneumonia was based on the COVID-19 Prevention and Control Program (4th edition) published by the National Health Commission of China<sup>[2]</sup>.

All patients received chest CTs and had throat-swab specimens obtained and maintained in viral-transport media . RT-PCR detection reagents were provided by the center for disease control and prevention(CDC), Wuhan, Hubei province. Laboratory confirmation of COVID-19 was done both in our hospital and the CDC laboratory of Hubei province. Confirmed cases of COVID-19 infection were defined as those with a positive test result from either laboratory<sup>[3]</sup>.

## Results

Of 1141 confirmed COVID-19 cases, 183 (16%) presented with gastrointestinal symptoms only, and their clinical characteristics are summarized in Table 1. Men slightly outnumbered women, and the most common GI symptom was loss of appetite, followed by nausea and vomiting which occurred in about two thirds of cases. Diarrhea and abdominal pain were the presenting symptom in 37% and 25% of patients, respectively.

Laboratory testing showed that mean leukocyte ( $2.7 \pm 0.2 \times 10^9/L$ ) and lymphocyte( $0.53 \pm 0.014, \times 10^9/L$  ) counts were below normal , and C-reactive protein levels were elevated ( $18.7 \pm 6.8$  mg/L). Mild elevations in serum transaminases were noted (AST, $65.8 \pm 12.7$  U/L; ALT,  $66.4 \pm 13.2$  U/L), but renal function generally was intact.

At the onset of their illness, 175 of 183 (96%) of patients had lung lesions on chest CT , which were unilateral in 61% of cases. The most common CT findings were

abnormal lung texture (83%), ground-glass densities (73%), consolidation (27%), and pleural effusion (11%).

The mean time elapsed for confirmation of COVID-2019 was 3.5 days from the onset of symptoms. Of the 183 patients, 7 died due to progressive respiratory failure, and 176 recovered.

## Discussion

Patients with COVID-19 typically present with fever or a respiratory syndrome. Our case series shows that some patients can present with gastrointestinal symptoms, with paucity of other manifestations. Such patients could be overlooked, leading to potentially serious consequences to them and their contacts. It is important that clinicians are aware that COVID-19 can present with predominantly GI symptoms, and maintain appropriate vigilance and high index of suspicion.

SARS-CoV-2 can enter angiotensin converting enzyme II (ACE2)- expressing cells. ACE2 is not only expressed in lung AT2 cells, but also can be found in the upper esophagus, and in stratified epithelial cells and absorptive enterocytes in the ileum and colon<sup>[4]</sup>. The enteric symptoms of SARS-CoV-2 may be associated with invaded ACE2-expressing enterocytes<sup>[5]</sup>. These findings suggest that the digestive system, along with the respiratory tract, may be a potential route for SARS-CoV-2 infection, and could explain why some patients present with gastrointestinal symptoms.

Much still needs to be learned about this zoonotic coronavirus which has crossed species to infect human populations<sup>[6]</sup>, and its spectrum of disease.

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Clinical characteristics/cases		<i>P</i> value
N=183	N (%)	
Gender		0.032
Male	102 (56%)	
Female	81 (44%)	
Age(mean±SD) years	53.8	
Epidemiological history		0.063
Environmental Exposure	94 (51%)	
Close contact	99 (54%)	
Gastrointestinal symptoms		
Nausea	134 (73%)	
Vomiting	119 (65%)	
Abdominal pain	45 (25%)	
Diarrhea	68 (37%)	
Loss of appetite	180 (98%)	
Both nausea and vomiting	37 (20%)	
Both abdominal pain and diarrhea	16 (9%)	
All symptoms	12 (7%)	
Laboratory characteristics		
Leukocyte( $\times 10^9/L$ ,3.5-9.5)	2.7±0.2	
Lymphocyte( $\times 10^9/L$ ,1.1-3.2)	0.53±0.014	
C-reactive protein(mg/L,0.-10.0)	18.7±6.8	
AST(Aspartate aminotransferase ,U/L,15-40)	65.8±12.7	
ALT(Alanine aminotransferase transaminase,U/L,9-50)	66.4±13.2	
BUN(blood urea nitrogen,mmol/L,2.8-7.6)	6.4±2.5	

Cre(creatinine,umol/L,64-104)	85.7±37.2
Chest CT findings	175
Unilateral	107 (61%)
Bilateral	68 (39%)
Abnormal lung texture	145 (83%)
Ground-glass shadow	128 (73%)
Pulmonary consolidation	47 (27%)
Unilateral pleural effusion	13 (7%)
Bilateral pleural effusion	7 (4%)

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Table 1. Patients with COVID-19 infection presenting with gastrointestinal symptoms.