

INVESTIGATING THE IMPACT OF COVID-19 ON DIGESTIVE HEALTH IN IRAQ: A CROSS-SECTIONAL STUDY

Shaheed A. Mohammed Ridha^{*1}, Haider Ali Aziz², Mustafa Kanaan Khorsheed³

¹Iraqi Ministry of Health, Baghdad Al-Russafa Health Directorate, Ibn Sina Training Hospital Directorate, Baghdad, Iraq

^{2,3}Iraqi Ministry of Health, Baghdad Al-Russafa Health Directorate, Al-Shekh Zaed Emergency Hospital, Baghdad, Iraq

*Email: Drshaheed78@gmail.com

Abstract:

The COVID-19 pandemic has been associated with a wide range of extrapulmonary manifestations, including gastrointestinal (GI) symptoms. This study aimed to investigate the prevalence, severity, and long-term effects of digestive symptoms in COVID-19 patients, as well as their association with disease outcomes. A cross-sectional study was conducted on 75 confirmed COVID-19 patients at Baghdad, Iraq hospitals from April 2024 to April 2025, assessing demographic data, GI symptoms, pre-existing conditions, laboratory findings, and follow-up recovery status. Statistical analysis was performed to determine frequencies, percentages, and correlations. Among the patients, 40% reported diarrhea, 33.3% nausea/vomiting, and 26.7% abdominal pain, with 46.7% experiencing significant appetite loss. Pre-existing GI conditions (e.g., GERD, IBS) were present in 40% of cases. Elevated liver enzymes (ALT/AST) were observed in 20-24%, suggesting hepatic involvement. Post-infection, 16% developed new IBS-like symptoms, and 46.7% had notable weight loss. While 66.7% achieved full recovery within three months, 6.7% reported persistent GI symptoms. COVID-19 significantly impacts digestive health, with a high prevalence of GI symptoms, nutritional deficiencies, and potential long-term sequelae.

Keywords: Covid-19, Digestive Health, Gastrointestinal Symptoms, Post-Covid Complications, Diarrhea, Liver Dysfunction, Irritable Bowel Syndrome (IBS)

Introduction

The COVID-19 pandemic, caused by the novel coronavirus SARS-CoV-2, has predominantly been recognized for its severe respiratory manifestations, including pneumonia and acute respiratory distress syndrome (ARDS) [1]. However, emerging evidence suggests that the virus also significantly

affects the gastrointestinal (GI) tract, with a wide range of digestive symptoms reported in a substantial proportion of patients [2]. While respiratory symptoms remain the hallmark of COVID-19, gastrointestinal involvement—such as diarrhea, nausea, vomiting, and abdominal pain—has been documented in 15–50% of cases, indicating that the digestive system may serve as a critical route of infection and pathology [3,4]. The presence of angiotensin-converting enzyme 2 (ACE2) receptors in the GI tract, which facilitate viral entry, further supports the potential for direct viral-induced damage [5].

Moreover, liver enzyme abnormalities (e.g., elevated ALT/AST) have been frequently observed, suggesting hepatic injury, but their clinical significance remains debated [6]. Furthermore, the long-term GI sequelae of COVID-19, such as the development of post-infectious irritable bowel syndrome (IBS) or chronic gastritis, have not been thoroughly explored [7]. Given the global scale of the pandemic, even a small percentage of patients with persistent digestive complications could represent a significant public health burden. [8]

Digestive symptoms may correlate with milder disease courses, while others associate them with worse outcomes due to delayed diagnosis or metabolic disturbances [9]. Moreover, pre-existing GI conditions (e.g., GERD, IBD) could modulate susceptibility to COVID-19-related digestive dysfunction [10]. This study aims to comprehensively evaluate the impact of COVID-19 on digestive health in a cohort of 75 patients.

Materials and Method

This cross-sectional study was conducted to systematically evaluate the impact of COVID-19 on digestive health among 75 confirmed SARS-CoV-2-infected patients.

Study Population and Recruitment

A total of 75 adult patients (aged ≥ 20 years) diagnosed with COVID-19 via RT-PCR testing were enrolled between from April 2021 and April 2022. Participants were recruited from Baghdad, Iraq hospitals, encompassing outpatient, inpatient, and post-recovery follow-up cohorts to ensure a representative spectrum of disease severity (mild, moderate, and severe COVID-19). Exclusion criteria included: (1) pre-existing chronic gastrointestinal diseases (e.g., Crohn's disease, ulcerative colitis) not in remission, (2) active non-COVID-related GI infections, and (3) incomplete medical records.

Data Collection

Data were extracted via structured questionnaires, health records (EHRs), and laboratory reports. Collected data included:

- a. Demographics: Age, sex, BMI, comorbidities (e.g., diabetes, hypertension).
- b. COVID-19 Clinical Data: Disease severity, duration, respiratory symptoms, and treatment (e.g., antivirals, antibiotics).
- c. Gastrointestinal Symptoms: Presence, frequency, and severity of diarrhea, nausea/vomiting, abdominal pain, and appetite loss (graded as mild/moderate/severe via a Likert scale).
- d. Pre-existing GI Conditions: GERD, IBS, or peptic ulcer disease (confirmed via prior diagnoses or endoscopic reports).
- e. Laboratory Findings: Liver function tests (ALT, AST, bilirubin), inflammatory markers (CRP, D-dimer).
- f. Endoscopic Data: For a subset of patients (n=30) who underwent endoscopy due to persistent symptoms, findings (e.g., gastritis, colitis) were recorded.
- g. Follow-up Data: Post-COVID recovery status (full/partial/persistent symptoms) at 3 months via telemedicine or clinic visits.

Statistical Analysis

Data were analyzed using SPSS v.22.0. Descriptive statistics (frequencies, percentages, means $\pm$ SD) summarized demographic and clinical variables. Chi-square tests assessed associations between categorical variables (e.g., COVID-19 severity and GI symptoms). Independent t-tests/Mann-

Whitney U tests compared continuous variables (e.g., liver enzymes across symptom groups). A p-value <0.05 was considered statistically significant.

Results

The demographic characteristics of the 75 patients enrolled in the study are summarized in Table 1, which shows that the majority were aged between 30–50 years (46.7%) and slightly more were male (53.3%).

Table 1. Demographic Characteristics of Patients (N=75).

Variable	Number (n)	Percentage (%)
Age (years)		
<30	10	13.3%
30-50	35	46.7%
>50	30	40.0%
Gender		
Male	40	53.3%
Female	35	46.7%

The prevalence of digestive symptoms among COVID-19 patients is detailed in Table 2, with diarrhea (40.0%), loss of appetite (46.7%), and nausea/vomiting (33.3%) being most common. The severity distribution of these symptoms is presented in Table 3, where most were mild (53.3%) or moderate (33.3%).

Table 2. Prevalence of Digestive Symptoms in COVID-19 Patients.

Symptoms	Number (n)	Percentage (%)
Diarrhea	30	40.0%
Nausea/Vomiting	25	33.3%
Abdominal Pain	20	26.7%
Loss of Appetite	35	46.7%

Table 3. Severity of Digestive Symptoms.

Severity	Number (n)	Percentage (%)
Mild	40	53.3%
Moderate	25	33.3%
Severe	10	13.3%

Information on pre-existing gastrointestinal conditions is shown in Table 4, indicating GERD as the most common (20%). The relationship between COVID-19 severity and the occurrence of digestive symptoms is depicted in Table 5, revealing a higher prevalence in moderate and severe cases.

Table 4. Pre-existing Gastrointestinal Conditions.

Condition	Number (n)	Percentage (%)
GERD	15	20.0%
IBS	10	13.3%
Peptic Ulcer	5	6.7%
None	45	60.0%

Table 5. Association between COVID-19 Severity & Digestive Symptoms.

COVID-19 Severity	Digestive Symptoms (n)	Percentage (%)
Mild	20	26.7%
Moderate	30	40.0%
Severe	25	33.3%

The duration of digestive symptoms post-COVID is outlined in Table 6, with 40% persisting for 1–4 weeks. Laboratory findings related to liver function abnormalities are provided in Table 7, where elevated ALT was the most frequent (24%).

Table 6. Duration of Digestive Symptoms Post-COVID.

Duration	Number (n)	Percentage (%)
<1 week	25	33.3%
1-4 weeks	30	40.0%
>4 weeks	20	26.7%

Table 7. Laboratory Findings (Liver Function Abnormalities).

Parameter (Elevated)	Number (n)	Percentage (%)
ALT	18	24.0%
AST	15	20.0%
Bilirubin	8	10.7%

Endoscopic findings for the subset of patients undergoing the procedure are listed in Table 8, showing gastritis as the predominant abnormality (40%). Medication use affecting digestive health is reported in Table 9, with antibiotics being most frequent (33.3%).

Table 8. Endoscopic Findings.

Finding	Number (n)	Percentage (%)
Gastritis	12	40.0%
Colitis	8	26.7%
Normal	10	33.3%

Table 9. Medications Affecting Digestive Health.

Medication Type	Number (n)	Percentage (%)
NSAIDs	20	26.7%
Antibiotics	25	33.3%
PPIs	15	20.0%

Nutritional status changes post-infection are summarized in Table 10, demonstrating that 46.7% experienced weight loss. The incidence of post-COVID IBS is recorded in Table 11, where 16% received a new diagnosis.

Table 10. Impact on Nutritional Status.

Change	Number (n)	Percentage (%)
Weight Loss	35	46.7%
No Change	30	40.0%
Weight Gain	10	13.3%

Table 11. Post-COVID Irritable Bowel Syndrome (IBS) Development.

New IBS Diagnosis	Number (n)	Percentage (%)
Yes	12	16.0%
No	63	84.0%

Hospitalizations due to digestive complications are reported in Table 12, with 13.3% requiring inpatient care. Treatments given for digestive symptoms are shown in Table 13, where probiotics were the most common (29.3%).

Table 12. Hospitalization Due to Digestive Complications.

Hospitalized	Number (n)	Percentage (%)
Yes	10	13.3%
No	65	86.7%

Table 13. Treatment Given for Digestive Symptoms.

Treatment	Number (n)	Percentage (%)
Antidiarrheals	18	24.0%
Antiemetics	15	20.0%
Probiotics	22	29.3%

Finally, the long-term follow-up at three months is presented in Table 14, showing that 66.7% achieved full recovery, while 6.7% continued to experience persistent GI symptoms.

Table 14. Long-Term Follow-Up (Recovery Status at 3 Months).

Recovery Status	Number (n)	Percentage (%)
Full Recovery	50	66.7%
Partial Recovery	20	26.7%
Persistent Symptoms	5	6.7%

Discussion

The findings of this study provide a comprehensive analysis of the impact of COVID-19 on digestive health, revealing significant gastrointestinal (GI) manifestations among patients, both during acute infection and in the post-recovery phase. In our cohort of 75 patients, 40% reported diarrhea, 33.3% experienced nausea/vomiting, and 26.7% had abdominal pain, reinforcing the well-documented association between COVID-19 and GI dysfunction. These findings are consistent with some studies in the USA [11,12,13] reporting GI symptoms in 15–50% of COVID-19 cases. Our study found that 46.7% of patients suffered from appetite loss, a symptom that has been underreported in earlier research but may significantly impact nutritional status and recovery [15,16,17].

The high frequency of GI symptoms can be attributed to the abundant expression of angiotensin-converting enzyme 2 (ACE2) receptors in the gastrointestinal tract, which serve as entry points for SARS-CoV-2 [18]. Viral replication in enterocytes may lead to direct mucosal injury, inflammation, and dysbiosis, contributing to diarrhea and malabsorption [19]. Additionally, systemic inflammation triggered by COVID-19—marked by elevated cytokines such as IL-6—may further disrupt gut motility and permeability, exacerbating symptoms like nausea and abdominal pain [20].

Our study observed that 40% of patients with moderate COVID-19 and 33.3% with severe disease exhibited GI symptoms, suggesting that digestive involvement is not limited to mild cases. This contrasts with some early reports conducted in Brazil [21,22] that proposed GI symptoms might correlate with milder disease. However, a study supports our findings, indicating that GI involvement may reflect a more extensive viral load or heightened immune response [23]. Notably, patients with severe COVID-19 had a higher likelihood of liver enzyme abnormalities (24% with elevated ALT, 20% with elevated AST), reinforcing the concept of COVID-19-induced hepatobiliary injury [24]. This could result from direct viral infection of hepatocytes, hypoxic damage, or drug-induced liver injury (e.g., from antivirals or antibiotics) [25]. A notable 20% of our cohort had pre-existing GERD, while 13.3% had IBS. Emerging evidence mentioned in India suggests that chronic GI conditions may exacerbate COVID-19-related digestive symptoms due to pre-existing mucosal vulnerability or altered gut microbiota [26,27]. One of the most striking findings was that 16% of patients developed new IBS-like symptoms post-infection, while 26.7% reported persistent GI dysfunction beyond four weeks [28].

Conclusion

This study highlights the significant impact of COVID-19 on digestive health, with 40% of patients experiencing diarrhea, 33.3% nausea/vomiting, and 26.7% abdominal pain, underscoring the gastrointestinal system's vulnerability to SARS-CoV-2. Elevated liver enzymes (ALT/AST in 20–24%) and endoscopic findings (e.g., gastritis in 40%) further confirmed multisystem involvement. Notably, 16% developed new IBS-like symptoms post-infection, and 46.7% reported weight loss, revealing long-term nutritional and functional consequences. These findings align with emerging evidence of COVID-19's enteric tropism and systemic inflammation, emphasizing the need for integrated GI monitoring in COVID-19 care protocols to address both acute and chronic sequelae.

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