

Symptoms and Outcome of COVID-19 in Patients with Inflammatory Bowel Disease: An 18-month Follow-up Study during the COVID-19 Pandemic

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ABSTRACT

Background:

Iran has been one of the most affected countries in the world by COVID-19. The aim of our study was to determine the outcome of COVID-19 in patients with inflammatory bowel disease (IBD). Furthermore, we analyzed the outcome of SARS-CoV-2 infection in patients with IBD treated with immunosuppressant.

Materials and Methods:

This is a cross-sectional, observational study. This study included all patients with IBD, regularly followed up in our IBD Clinic at a tertiary medical center from February 5th, 2020 to August 5th, 2022. We identified those patients with confirmed SARS-CoV-2 infection either by PCR test or chest computed tomography (CT) imaging.

Results:

A total of 401 patients were recruited (n=346 [86.28%] with ulcerative colitis, n=53 [13.22%] with Crohn's disease, and 2 [0.5%] with indeterminate colitis). Of these patients, 273 (68.08%) developed no symptoms or signs during the follow-up period, 128 patients developed symptoms similar to COVID-19, and 76 (18.9%) were diagnosed as confirmed COVID-19 cases. Men comprised 60.5% of the confirmed COVID-19 groups, which shows that men were statistically more likely to have symptoms of COVID-19 during the follow-up period (P=0.04). No significant differences were observed among confirmed and non-COVID-19 cases in terms of concomitant medications: steroids (P=0.6), thiopurines (P=0.23), anti-TNF (P=0.23), and aminosalicylate (P=0.61). Three patients required hospitalization, but there were no admissions to the intensive care unit or deaths related to COVID-19.

Conclusion:

The risk of COVID-19-related adverse outcomes and death in patients with IBD is low. Also, patients with IBD under immunosuppressive treatment are not at an increased risk of COVID-19.

Keywords: Inflammatory bowel disease, IBD, SARS, COVID 19

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INTRODUCTION

Since the beginning of the COVID-19 pandemic, the management of inflammatory bowel disease (IBD) has become a challenge for physicians.

There has been great concern regarding the outcomes of COVID-19 in patients with IBD. Although some studies suggest that patients with IBD are not at an increased risk of COVID-19 (1,2), there is still uncertainty about the risks, benefits, and impact of immunosuppressive treatments in patients with IBD during the COVID-19 pandemic (3,4).

The long-term follow-up of patients with IBD may help gain a better understanding of the implications of the SARS-CoV-2 infection for these patients. After China, Iran emerged as the second country with a COVID-19 epidemic, with the infection quickly spreading in different parts of the country (5). While the main focus was on COVID-19, the care of patients with IBD also underwent dramatic change, and there was a reconsideration of triage and management of patients requiring services previously thought to require immediate availability (6). The north of Iran was one of the areas with the highest incidence rates of COVID-19 throughout the pandemic in Iran (7). The aim of this study was to report the results of an 18-month follow-up of patients with IBD being treated in our IBD clinic located in an area of high incidence of COVID-19 during the pandemic.

MATERIALS AND METHODS

This observational study included all patients with IBD who were regularly followed up in our IBD clinic at Rohani Tertiary Medical Center from February 5th, 2020, to August 5th, 2021.

With the intensification of the SARS-CoV-2 epidemic in February 2020, Rohani Hospital, which is the largest medical center in northern Iran, was transformed into a COVID-19 referral hospital, and its outpatient clinics, including our IBD clinic, were closed.

To communicate with our patients without physical contact, we used telemedicine services, which included phone access to a trained individual at any time of the day to answer questions. We also used this service to provide necessary information about the symptoms and prevention of COVID-19 by phone messages.

To ensure adequate follow-up, we identified all the patients undergoing treatment in our IBD clinic and contacted them by phone. The patients were asked whether they had experienced any symptoms and signs suggesting COVID-19 during the pandemic, including fever, cough, dyspnea, sore throat, diarrhea, myalgia, dysosmia or dysgeusia, headache, diarrhea, nausea, and vomiting. If a patient had a history of suspected symptoms, they were asked whether they had

received any positive results on either the pharyngeal swab, serology test, or chest imaging in favor of SARS-CoV-2 infection. Also, any information regarding outpatient visits and hospital admissions related to COVID-19 was checked and documented. We then reviewed all the test results and imaging reports to confirm that all the data were correct. The patients who could not be accessed by phone were excluded from the study. In May 2020, SARS-CoV-2-associated illnesses and hospitalization rates decreased, and our IBD clinic resumed its activity, but we continued the follow-up calls alongside the necessary in-person visits in the clinic. From February 5th, 2020, to August 5th, 2021, we contacted all the patients included in the study at least three times and also made another phone call after August 5th, 2021, to confirm the data with them and find out any changes in the patients' condition. The data were extracted regarding the patients' demographic characteristics, IBD type and treatment regimen, symptoms of COVID-19, confirmation of SARS-CoV-2 infection either by polymerase chain reaction (PCR), serology, or computed tomography (CT) imaging, hospital admissions, and mortality related to COVID-19. We identified those patients with confirmed SARS-CoV-2 infection either by PCR test or chest CT imaging. All confirmed CT images were interpreted by an expert radiologist. We also determined the proportion of patients with IBD with ICU admission, mechanical ventilation, or death due to COVID-19. We then compared the characterization of patients with IBD with and without COVID-19. None of the included patients were vaccinated against SARS-CoV-2 infection during the follow-up period.

Statistical analysis

The statistical tool used to conduct the analysis was the SPSS software (version 24, IBM, Chicago, IL, USA). Descriptive statistics and χ^2 test were used to describe the variables. The study was approved by the clinical research committee of Rohani Hospital, Babol, Iran. Verbal informed consent was obtained from all surveyed patients.

RESULTS

A total of 401 patients were recruited (n=346 [86.28%] with ulcerative colitis, n=53 [13.22%] with Crohn's disease, and two [0.5%] with indeterminate colitis). Their median age was 42 years (range 20-81). Of these patients, 273 (60.08%) developed no symptoms or signs during the follow-up period, 128 patients developed symptoms similar to COVID-19, but 76 (18.9%) were diagnosed as confirmed COVID-19 cases. Table 1 shows the demographic and treatment characteristics of the participating patients.

Men comprised 60.53% (n=46) of the confirmed and 47.08% (n=153) in non-COVID-19 group, while women comprised 39.47% (n=30) of the confirmed COVID-19

group comparing with 52.92% (n=172) in non-COVID-19 group which shows that men were statistically more likely to have symptoms of COVID-19 during the follow-up period (P=0.04), Clinical manifestations of SARS-CoV-2 infection are shown in Table 2. Fever and fatigue were the most common COVID-19 symptoms.

No significant differences were observed among the confirmed COVID-19 cases in terms of concomitant medications: steroids (P=0.6), thiopurines (P=0.2), anti-TNF (P=0.2), aminosalicylate (P=0.6) and methotrexate (P=0.6). Furthermore, only one patient was under

treatment with tofacitinib. This patient developed no signs or symptoms in favor of COVID-19 during the follow-up period. Three patients required hospitalization associated with COVID-19, but there were no admissions to the intensive care unit (ICU) or deaths related to COVID-19. Only one patient died during the follow-up: a man aged 74 years who was admitted because of extensive myocardial infarction. He had two consecutive negative SARS-CoV-2 PCR tests in the hospital.

Table 1. Demographic and treatment characteristics of patients included in the study

	Non-COVID-19 cases (n=325)	Confirmed COVID-19 cases (n=76)	Total (n=401)
Age, Years, Medians	44.5	37.5	42
Sex			
Female	172 (52.92%)	30 (39.47%)	202 (50.37%)
Male	153 (47.08%)	46 (60.53%)	199 (49.63)
Type of IBD			
UC	286 (88%)	60 (78.9%)	346 (86.28)
CD	38 (11.69%)	15 (19.73%)	53 (13.22%)
Indeterminate colitis	1 (0.30%)	1 (1.31%)	2 (0.5%)
Type of IBD treatment			
Aminosalicylates	130 (40 %)	33 (43.42%)	163 (40.64)
Thiopurines	81 (24.92%)	24 (31.58%)	105 (26.18)
TNF inhibitors	62 (19.08%)	10 (13.16%)	72 (17.95%)
Steroids	20 (6.15%)	3 (3.95%)	23 (5.73%)
Methotrexate	12 (3.69%)	2 (2.63%)	14 (3.49%)
Tofacitinib	3 (0.92%)	0 (0%)	3 (0.75%)

Table 2. Clinical manifestations of SARS-CoV-2 infection in patients with IBD

Variabels	Total (n=76)
Fever (%)	51 (67.10)
Fatigue (%)	39 (51.31)
Cough (%)	
Myalgia or arthralgia (%)	26 (34.21)
Rhinorrhea (%)	3 (3.95)
Sweating (%)	14 (18.42)
Diarrhea or vomiting (%)	18 (23.68)
Dysosmia or dysgeusia(%)	25 (32.89)
Headache (%)	13 (17.10)
Sorethroat (%)	8 (10.53)

DISCUSSION

In the present study, patients with IBD were followed up for 18 months and through four waves of COVID-19 in an area with high incidence in Iran.

The results of our follow-up study showed that the risk of adverse outcomes and death in patients with IBD is low, and most of the patients experienced mild symptoms.

Different studies have suggested that patients with IBD are not at an increased risk of COVID-19 (2,3); however, it is important to note that these findings may be influenced by social behaviors, in particular, the potential for patients with IBD to be more likely to follow preventive measures and social distancing due to their perceived higher risk of infection (8).

Nevertheless, the data regarding the risk of adverse outcomes and mortality in patients with IBD who develop COVID-19 is conflicting, and some reports suggest that patients with IBD and SARS-CoV-2 infection are not at an increased risk of adverse outcomes (9,10), while some other studies have found an increased COVID-19-related mortality rate in patients with IBD (4).

Based on our evaluation, it can be concluded that 81% of our patients did not experience COVID-19. Our data suggests that patients with IBD under immunosuppressive treatment are not at an increased risk of COVID-19, in comparison with the patients with IBD who do not receive immunosuppressant drugs and confirmed the evidence that patients with IBD should continue their immunosuppressive treatment while maintaining the preventive measures.

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Some other studies have concluded that consumption of anti-TNF medications were not associated with more severe outcomes in patients with IBD (10).

There were no COVID-19-related mortalities or ICU admissions in the confirmed cases of COVID-19 during the follow-up period. This finding suggests that patients with IBD who develop COVID-19 are not at an increased risk of adverse outcomes. Also, in this study, symptoms of SARS-COV-2 infection were more common in men than women. The epidemiological findings reported across different parts of the world have indicated that men are more vulnerable to COVID-19 than women (11), and this is possibly mediated by several factors, including high expression of coronavirus receptors (ACE 2) in men, sex hormones, and more responsible attitude toward the COVID-19 pandemic in women (11).

Our study had several limitations. Some of our patients who experienced mild symptoms preferred to stay at home than to go to COVID-19 clinics due to their overwhelming fear of being contaminated by more aggressive forms of the virus (12). Nonetheless, we believe that our conclusion, suggesting that patients with IBD are not at an increased risk of COVID-19 adverse outcomes and mortality, should be reliable.

CONFLICT OF INTEREST

The authors declare no conflict of interest related to this work.