

Worldwide Management of Inflammatory Bowel Disease During the COVID-19 Pandemic: An International Survey

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Background and Aims: Persons with inflammatory bowel disease (IBD) may be particularly vulnerable to COVID-19 either because of their underlying disease or its management. Guidance has been presented on the management of persons with IBD in the time of this pandemic by different groups. We aimed to determine how gastroenterologists around the world were approaching the management of IBD.

Methods: Members of the World Gastroenterology Organization (WGO) IBD Task Force contacted colleagues in countries largely beyond North America and Europe, inviting them to review the WGO website for IBD and COVID-19 introduction, with links to guideline documents, and then to respond to 9 ancillary open-ended management questions.

Results: Fifty-two gastroenterologists from 33 countries across 6 continents completed the survey (April 14 to May 16, 2020). They were all adhering for the most part to published guidelines on IBD management in the COVID-19 era. Some differences and reductions in services related to access, and some related to approach within their communities in terms of limiting virus spread. In particular, most gastroenterologists reduced in-person clinics (43 of 52), limited steroid use (47 of 51), limited elective endoscopy (45 of 52), and limited elective surgeries (48 of 51). If a patient was diagnosed with COVID-19, immunomodulatory therapy was mostly held.

Conclusions: In most countries, the COVID-19 pandemic significantly altered the approach to persons with IBD. The few exceptions were mostly based on low burden of COVID-19 in individual communities. Regardless of resources or health care systems, gastroenterologists around the world took a similar approach to the management of IBD.

Key Words: COVID-9, pandemic, inflammatory bowel disease, immunomodulatory therapy, management

INTRODUCTION

Inflammatory bowel disease (IBD) is a global disease with high prevalence in the Western world and rapidly rising incidence in newly industrialized countries in Asia, Africa, and Latin America.¹⁻³ The management of IBD may differ by geography with economically more advanced countries having greater access to health care resources such as endoscopy and expensive therapies like biologics.⁴ Geographic differences and inequities in access to IBD management may be heightened during the coronavirus 2019 disease (COVID-19) pandemic, as lockdown measures have placed significant strain on government and personal finances.

There has been uncertainty to what extent persons with IBD may be at increased risk of being infected with the severe acute respiratory syndrome coronavirus (SARS-CoV-2), whether their outcomes from COVID-19 would be different from the general population, and whether immunomodulatory therapies (including both immunosuppressive and biological therapies) used in the treatment of IBD pose a significant increased risk for adverse outcomes from COVID-19. Despite the uncertainty, there has been some agreement reached among international IBD specialists, including the International Organization for the Study of IBD (IOIBD),⁵ the American Gastroenterological Association (AGA),⁶ the British Society for Gastroenterology (BSG),⁷ and the European Crohn's and Colitis Organisation (ECCO).⁸ Recommendations include continuing all immunomodulatory medications in patients with IBD, reducing steroid doses as much as possible, limiting elective endoscopies, and encouraging telemedicine in place of in-person clinic visits.

Although the most severe aspect of COVID-19 infections are respiratory symptoms, gastrointestinal (GI) symptoms are common. A meta-analysis suggested that gastrointestinal symptoms may be seen in 5%–10% of persons presenting with COVID-19.⁹ Moreover, a report from Hubei Province, China (Wuhan is the capital city), the initial COVID-9 epicenter, suggested that nearly 16% of affected persons had gastrointestinal symptoms.¹⁰ In 2 large American series, gastrointestinal

symptoms were seen in 32% of 1141 persons with COVID-19 in California¹¹ and in 33% of 1059 affected persons with COVID-19 from New York City.¹² In this New York City study, having IBD or being on immunosuppressive therapy were not associated with presenting with gastrointestinal symptoms. However, the possibility that gastrointestinal symptoms are part of a COVID-19 infection poses a particular challenge in managing persons with IBD. For persons with IBD presenting with increasing gastrointestinal symptoms, the challenge for the clinician is whether these symptoms reflect a flare of IBD or COVID-19.

The World Gastroenterology Organization (WGO) has a mandate to deliver education and information to clinicians worldwide. An introduction to management challenges for persons with IBD was presented on the WGO website with links to some of the reports described previously.¹³ We aimed to develop an understanding of international management approaches to persons with IBD during the pandemic, with an emphasis on countries that were less likely to be represented in guidelines put forth by the IOIBD, AGA, BSG, or ECCO. In particular, we wanted to determine how management of IBD was being handled in countries with fewer resources and to what extent management differed from North America and Europe.

METHODS

Members of the WGO who have worked on global IBD-related practice guidelines (WGO IBD Task Force) reached out to colleagues across the world to review current recommendations regarding management of persons with IBD and to answer ancillary questions about their practices in their communities during the COVID-19 pandemic. Most of these colleagues had leadership roles in the management of IBD in their respective communities. It was not the intention to get as many gastroenterologists as possible to respond but rather to get as many countries represented as possible, especially from countries outside of Canada, the United States, and Europe. Gastroenterologists mostly from North America and Europe participated in the position papers from the AGA, BSG,

ECCO, and IOIBD.¹⁻⁴ Hence, it was the goal to reach out to gastroenterologists who would be practicing in countries less likely to be represented in these guidelines. Some gastroenterologists from North America and Europe were included. Nine questions were sent electronically and allowed for open-ended responses. The 9 questions posed to participants were

- 1) What is the effect of resource availability on recommendations (referring to recommendations published by international organizations)?
- 2) Are you still having in-person clinics?
- 3) Are you conducting any elective endoscopy in IBD patients, and if so, for which indications have you been undertaking endoscopy?
- 4) If an IBD patient develops COVID-19, how does this affect other treatment?
- 5) What is the role of surgery in the face of COVID-19? Does COVID-19 affect the indications for surgery or the scope of surgical interventions?
- 6) If in a low resource area and there is no access to biologicals, how does one address steroid use in the current environment of COVID-19 concerns?
- 7) How should one investigate and manage someone presenting with potential new onset IBD? How is this affected by resource availability?
- 8) Considering that at least 5% of persons with COVID-19 present with isolated GI symptoms when a patient with IBD presents with worsening GI symptoms, are you routinely testing for COVID-19?
- 9) What is the role of noninvasive markers in assessing disease if endoscopy is not available? For example, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), fecal calprotectin, white

blood cell count (WBC), platelet count, radiology? How does resource availability affect this?

Responses were received between April 14, 2020, and May 16, 2020. All responses were collated by one author (CNB), and responses were inputted into tables. Where there were unique responses underscoring an important management issue, this was highlighted in the report.

RESULTS

Fifty-two gastroenterologists from 33 countries across 6 continents completed the survey (due to potential resource allocation differences, Hong Kong was considered separate from China, and Puerto Rico was considered separate from the United States; Fig. 1). Three respondents were pediatric gastroenterologists. The results are summarized after each question and also in the tables (Tables 1–3). Table 1 also presents whether the country is a high income country or not, as per the World Bank.¹⁴

1) What is the effect of resource availability on recommendations (Table 1)?

Countries across the world were mostly able to abide by the recommendations, but respondents identified several challenges. First, the availability of personal protective equipment (PPE) was limited. Limited supply of PPE was reported from Bangladesh, China, Mexico, Puerto Rico, and Thailand. Further, a discrepancy between private and public hospitals for availability of PPE was reported in Brazil. Second, travel restrictions and home isolation affected availability of resources. For example in China, travel restrictions affected access to medications that was rectified by increased use of e-commerce

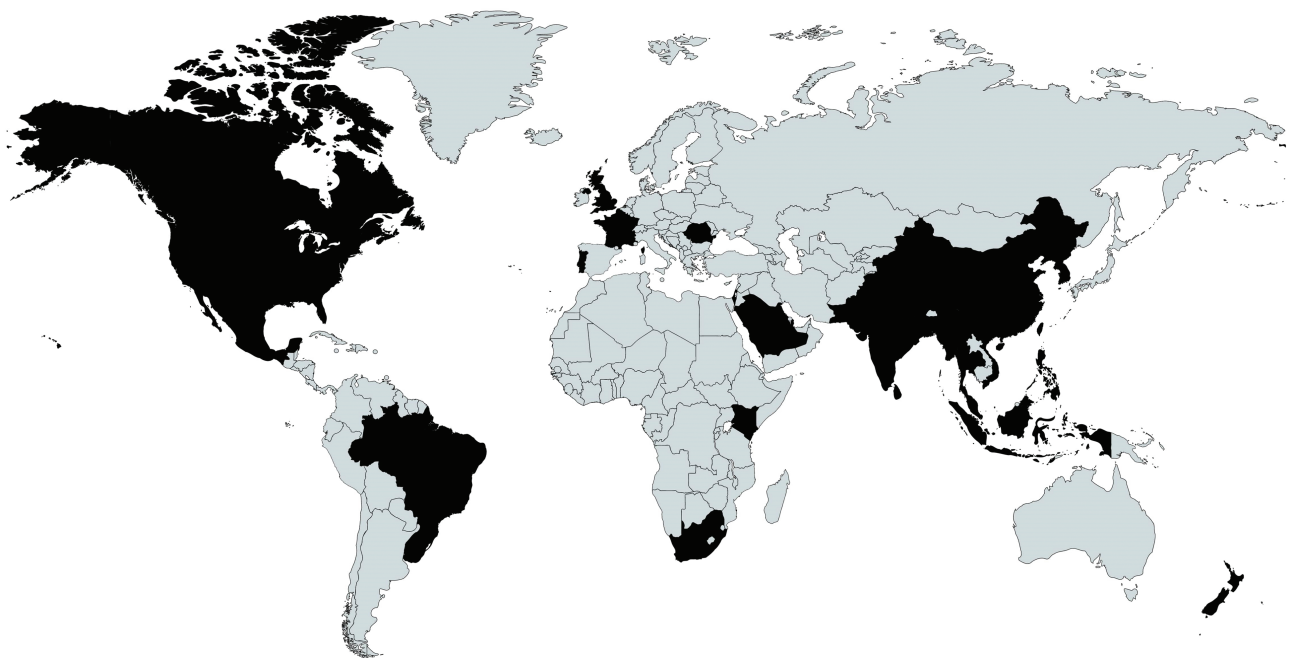


FIGURE 1. World map highlighting countries represented in this study.

TABLE 1. Questions 1–3

Country	High Income* Economy 1=yes 0=No	What is the effect of resource availability on recommendations?	Are you still having in-person clinics?	a) Are you conducting any elective endoscopy in IBD patients; b)for which indications have you been undertaking endoscopy?*
Bangladesh (n = 2)	0	Significant effect. Limited PPE, COVID-19 testing and hospital beds	Yes but reduced (n = 1) No to private practice, yes in government hospital (n = 2)	a)No (n = 2)
Brazil (n = 4)	0	No effect. Difference between public and private system	Yes = 1, Yes but reduced = 2, No = 1	a) No to elective (n = 4) b)Active colitis, cancer, bleeding, obstruction
Canada (n = 3)	1	No effect	No = 1, Yes but reduced = 2	a) No to elective (n = 1) Diagnostic endoscopy in IBD to decide on treatment (n = 2) b)Active colitis, bleeding, cancer, obstructions
China (n = 4)	0	Traffic restrictions limited access. Some limitation on PPE	Yes = 1, Yes but reduced = 1, No = 2	a)Yes (n = 4)
France (n = 1)	1	No effect	Yes, but reduced	No to elective Active colitis, bleeding, diagnosis before starting biological therapy.
Hong Kong (n = 1)	1	No effect	Yes	a)No
India (n = 2)	0	1 center had no effect 1 center had limit on testing	Yes, but reduced (n = 2)	a) No b) Active colitis
Indonesia (n = 1)	0	No effect	Yes	a)No
Israel (n = 2)	1	No effect	Yes, but reduced (n = 2)	a)No to surveillance but yes to assessing response to biological therapy n = 1 No, n = 1 b)Active colitis, bleeding
Kenya (n = 2)	0	Limitations (not specified)	Yes, but reduced (n = 2)	a)No (n = 2)
Korea (n = 1)	1	No effect	Yes	a)No b) Active colitis, newly diagnosed
Kuwait (n = 1)	1	?	Yes, but reduced	a)No b) Active colitis, bleeding, anemia, severe diarrhea
Malaysia (n = 2)	0	No effect	Yes, but reduced (n = 2)	a)No b)undiagnosed lower GI symptoms, bleeding, refractory to therapy, rule out cytomegalovirus
Mexico (n = 1)	0	No effect	Yes, but reduced	a)No b)prebiological therapy, bleeding, rule out infection
Myanmar (n = 2)	0	?	Yes	a)No b)IBD flare having endoscopy
Nepal (n = 1)	0	No effect	No	a)No
New Zealand (n = 1)	1	No effect	Yes, but reduced	a) No b) emergency indications
Pakistan (n = 2)	0	Difference between private and public system	Yes, but reduced (n = 2)	a)No (n = 2) b)if endoscopy necessary COVID-19 test done first
Philippines (n = 1)	0	Profound effect	No	No
Portugal (n = 2)	1	No effect	No (n = 1) Yes, but reduced (n = 1)	a)No (n = 2)

TABLE 1. Continued

Country	High Income* Economy 1=yes 0=No	What is the effect of resource availability on recommendations?	Are you still having in-person clinics?	a) Are you conducting any elective endoscopy in IBD patients; b)for which indications have you been undertaking endoscopy?*
Puerto Rico (n = 1)	1	Remote work not possible for all patients, and not all employers provide appropriate distancing conditions. Limit on PPE availability	No	a)No b)to rule out infection
Qatar (n = 1)	1	Outpatient endoscopy not available	No	a)No
Romania (n = 1)	0	No effect	Yes but reduced	a)No
Saudi Arabia (n = 1)	1	No effect; curfew in place	Yes but reduced	a)No b) disease flares
Singapore (n = 1)	1	No effect	Yes but reduced	a)No b)disease flares, cancer
South Africa (n = 1)	0	Patient avoidance of the hospital limits access for blood testing or collecting medicines. Patients with active disease are self- medicating with prednisone that they have stored at home	Yes but reduced	a)No b) acute colitis, newly diagnosed patients pre therapy initiation
Sri Lanka (n = 1)	0	No effect	Yes but reduced	a) No b) Rectal bleeding
Taiwan (n = 1)	1	No effect	Yes	a)Yes
Thailand (n = 3)	0	Limited supply of PPE	Yes but reduced (n = 3)	a)No (n = 3)
United Kingdom (n = 1)	1	No effect	No	a)No b)acute colitis, GI bleeding
United States (n = 2)	1	No effect	No = 1, Yes but reduced = 1	a)No b) large polyp, Endoscopic stricturotomy, balloon dilatation.
Uruguay (n = 1)	1	No effect	Yes, but reduced	a)No b)Before making major change in therapy
Vietnam (n = 1)	0	No effect	Yes	a)No b)if change in treatment needed. COVID-19 test done first

Abbreviations: n refers to number of respondents from that country;? refers to unclear response on that question

*A high-income economy is defined by the World Bank as a country with a gross national income per capita of US\$12,376 or more in 2018, calculated using the Atlas method.¹⁵

**No response provided in the survey to this question.

to facilitate drug delivery. In South Africa, there was concern that patients' fears of infection reduced their willingness to pick up prescribed medications, leading to patients to use their own personal supplies of prednisone for treatment of flares. From Puerto Rico, there was a comment on limited ability to work from home and limited numbers of employers allowing for proper distancing. Finally, a respondent from India highlighted the problem of limited access to testing.

2) Are you still having in-person clinics (Table 1)?

The vast majority (43 of 52) reported a marked reduction in in-person clinics, restricting clinics to persons who were at least

moderately ill. Practices were effectively closed to in-person outpatient visits in Nepal, New Zealand, Philippines, Puerto Rico, the UK, in practices from Canada (a pediatric practice), in 2 of 4 clinics in China, in one of 3 in Brazil, in 1 of 2 in Portugal, and 1 of 2 in the US surveys. Practices from Indonesia, Korea, Myanmar, Taiwan, and Vietnam and 2 of 4 from China and 1 of 3 from Brazil were open to seeing outpatients without reduction.

3) Are you conducting any elective endoscopy in IBD patients, and if so, for which indications have you been undertaking endoscopy (Table 1)?

There was general consensus (45 of 52) that elective endoscopy was not offered. Respondents reported the use

TABLE 2. Questions 4–6

Country	If an IBD patient develops COVID-19, how does this affect other treatment?	What is the role of surgery in IBD in the face of COVID-19? Does COVID-19 affect the indications for surgery or the scope of surgical interventions?	If, in a low resource area and there is no access to biologicals, how does one address steroid use in the current environment of COVID-19 concern?
Bangladesh (n = 2)	No cases yet (n = 2)	Limited surgery availability (n = 1) Urgent surgeries only (n = 1)	Avoid steroids or use lowest possible dose (n = 1) No change in steroid dosing unless COVID-19 positive (n = 1)
Brazil (n = 4)	D/C immunomodulatory therapy	Urgent surgeries only	Avoid steroids (n = 1) Selective use (n = 2) Only use budesonide (n = 1)
Canada (n = 3)	D/C immunomodulatory therapy Rapid steroid taper	Urgent surgeries only	Selective use (n = 3) Use budesonide (n = 2)
China (n = 4)	Reduce or discontinue immunomodulatory therapy D/C steroids (n = 2)	Urgent surgeries only Pre-op testing for COVID-19 (n = 1)	Avoid steroids (n = 3). Use budesonide (n = 1)
France (n = 1)	D/C immunomodulatory therapy D/C steroids	Urgent surgeries only	Avoid steroids. Good access to biological therapy
Hong Kong (n = 1)	D/C immunomodulatory therapy D/C steroids	Urgent surgeries only	Avoid steroid use; use budesonide
India (n = 2)	D/C immunomodulatory therapy (n = 1) May continue therapy depending on severity of and IBD (n = 1)	Urgent surgeries only Laparoscopy after COVID testing (n = 1)	Steroids use more selective, taper more rapid
Indonesia (n = 1)	D/C immunomodulatory therapy	No change in approach to surgery	Avoid steroid use
Israel (n = 2)	D/C immunomodulatory therapy	Urgent surgeries only (n = 1) No change in surgeries (n = 1, pediatric)	Steroids as needed
Kenya (n = 2)	Impact on steroid use (No = 1) No change (n = 1)	No change in approach to surgery (n = 1) Urgent surgeries only (n = 1)	Use more thiopurines and if using steroids patient is in isolation (n = 1) Taper rapidly, reduce dose (n = 1)
Korea (n = 1)	D/C immunomodulatory therapy D/C steroids	Urgent surgeries only	Avoid steroid use, rapid tapering Use budesonide
Kuwait (n = 1)	Switch IV biological therapy to SC Avoid steroids	?	Avoid steroids
Malaysia (n = 2)	Continue maintenance therapy (n = 1) D/C immunomodulatory therapy (n = 1)	Urgent surgeries only	Rapid steroid taper
Mexico (n = 1)	5ASA, budesonide, vedolizumab continued; D/C other immunomodulatory therapy D/C steroids	Urgent surgeries only	Selective steroid use where biological therapy can not be accessed budesonide used.
Myanmar (n = 2)	D/C immunomodulatory therapy	Urgent surgeries only. Done in negative pressure operating room.	Avoid steroids; use budesonide
Nepal (n = 1)	Use lower dose steroids	Urgent surgeries only	Avoid steroid use, rapid tapering
New Zealand (n = 1)	D/C immunomodulatory therapy	Urgent surgeries only	Avoid steroid use
Pakistan (n = 2)	Continue 5ASA, thiopurines, reduce steroids, biological therapy not available (n = 1) No cases yet (n = 1)	Urgent surgeries only Pre-op testing for COVID-19 (n = 1)	No change in steroid use (n = 1) Use as little as possible (n = 1)

TABLE 2. Continued

Country	If an IBD patient develops COVID-19, how does this affect other treatment?	What is the role of surgery in IBD in the face of COVID-19? Does COVID-19 affect the indications for surgery or the scope of surgical interventions?	If, in a low resource area and there is no access to biologicals, how does one address steroid use in the current environment of COVID-19 concern?
Philippines (n = 1)	No change in mild cases	Avoiding surgery as much as possible	Shorten period of steroid use
Portugal (n = 2)	D/C immunomodulatory therapy Rapid steroid taper	Urgent surgeries only	Use steroids if needed even if Covid-19 positive (n = 1) Using steroids to induce remission if starting biologicals but otherwise avoiding doses above 10 mg (n = 1)
Puerto Rico (n = 1)	No cases yet	Urgent surgeries only	Avoid steroids; good access to biologicals
Qatar (n = 1)	Only biological therapy discontinued	Urgent surgeries only	If steroids required patient would be in isolation
Romania (n = 1)	No cases yet	Urgent surgeries only	Avoid steroids; good access to biologicals
Saudi Arabia (n = 1)	Continue 5ASA, thiopurines; Continue biological therapy depending on disease severity D/C steroids	Urgent surgeries only	Avoid steroids
Singapore (n = 1)	No cases yet	Urgent surgeries only	Avoid steroids; good access to biologicals
South Africa (n = 1)	No cases yet	Surgeries on hold (no mention of urgent cases)	Avoid steroid use except in acute severe colitis
Sri Lanka (n = 1)	No cases yet	Urgent surgeries only (i.e. obstruction or abscess in Crohn's disease)	Lower doses and short courses when needed
Taiwan (n = 1)	Continue immunomodulatory therapy D/C steroids	No change	Avoid steroids; good access to biologicals
Thailand (n = 3)	D/C immunomodulatory therapy D/C steroids	Urgent surgeries only (n = 2) Avoid surgery when possible (n = 1)	Use steroids with taper
Uruguay (n = 1)	No cases yet	Urgent surgeries only	?
United Kingdom (n = 1)	D/C immunomodulatory therapy	Urgent surgeries only Laparoscopy after COVID testing	Rapid steroid taper
United States (n = 2)	D/C thiopurine and anti TNF; Continue Vedolizumab and Ustekinumab (n = 1) D/C immunomodulatory therapy D/C steroids (n = 1)	Urgent surgeries only	Use steroids if necessary after 7 days of infection onset (n = 1) Avoid steroids (n = 1)
Vietnam (n = 1)	No cases yet	Urgent surgeries only Pre-op testing for COVID-19 (n = 1)	No change in steroid use; confirm COVID-19 negative

Abbreviations: n refers to number of respondents from that country. “?” refers to unclear response on that question. D/C, discontinue.

of endoscopy in emergencies (eg, bleeding or acute severe disease or cancer) or when endoscopy would change management or be therapeutic. The responses included provisos for urgent indications from 1 of 2 centers in India, Romania, Portugal, Pakistan, and Hong Kong. In Myanmar and Saudi Arabia, elective endoscopy was cancelled, but endoscopy

would be undertaken in the setting of an IBD flare. In contrast, a few practices maintained nonurgent endoscopy. For example, 1 center in Israel performed endoscopy to assess mucosal healing, and Taiwan carried out endoscopy for clinical trials and to document rationale for drug reimbursement.

TABLE 3. Questions 7–9

Country	How should one investigate and manage someone presenting with potentially new onset IBD? How is this affected by resource availability?	Considering that at least 5% of persons with COVID-19 present with isolated GI symptoms when a patient with IBD presents with worsening GI symptoms are you routinely testing for COVID-19?	What is the role of noninvasive markers in assessing disease if endoscopy is not available? For example, ESR, CRP, fecal calprotectin, WBC / platelet count, radiology? How does resource availability affect this testing?*
Bangladesh (n = 2)	No change from pre-COVID Some limitation on access to endoscopy and imaging	Yes (n = 2)	Some limitation on access to imaging (n = 1) All testing done (n = 1)
Brazil (n = 4)	Avoid endoscopy	No (n = 3), Yes (n = 1)	All testing done (n = 3) Limited imaging access (n = 1)
Canada (n = 3)	Doing colonoscopy. Avoid IV biologics if possible	No (n = 3)	All testing done (n = 1) Limited imaging access (n = 2)
China (n = 4)	Avoid endoscopy and in person testing (n = 2) Doing endoscopy (n = 1) Doing endoscopy and test for COVID 19 first (n = 1)	Yes (n = 4)	All testing done
France (n = 1)	Limited endoscopy	Yes	All testing done
Hong Kong (n = 1)	Limited endoscopy COVID-19 test first	Yes	All testing done
India (n = 2)	Avoid endoscopy (n = 1) Doing endoscopy (n = 1)	No (n = 1) Yes (n = 1)	All testing done
Indonesia (n = 1)	No change from pre-COVID	Yes	All testing done
Israel (n = 2)	No change from pre-COVID (n = 1) Patients reluctant for testing. Empiric treatment (n = 1)	No (n = 2)	All testing done Fecal calprotectin at home (n = 1)
Kenya (n = 2)	No change from pre-COVID-19 (n = 2)	No (n = 2)	All testing done (n = 2)
Korea (n = 1)	No change except for avoiding steroids and doing COVID-19 testing	No	All testing done
Kuwait (n = 1)	No change from pre-COVID-19 except endoscopy is limited	No	All testing done
Malaysia (n = 2)	Avoid endoscopy (n = 1) No change from pre-COVID-19 (n = 1)	Yes (n = 1) No (n = 1)	All testing done (n = 2)
Mexico (n = 1)	Endoscopy in suspected UC; diagnosis delayed in CD	No	All testing done
Myanmar (n = 2)	Endoscopy is limited	No	All testing done
Nepal (n = 1)	Limited access to endoscopy. Using mostly CT scan.	No	Using mostly CT scan and bloodwork. Fecal calprotectin not available.
New Zealand (n = 1)	If subacute use labs not endoscopy	No	All testing done
Pakistan (n = 2)	Endoscopy being done	No (n = 1) Yes (n = 1)	All testing done
Philippines (n = 1)	Endoscopy used to aid in diagnosis and management of IBD in moderate to severe cases	Yes	Imaging tested preferred to serum and stool
Portugal (n = 2)	No change (n = 1) Less endoscopy and more imaging, noninvasive testing (n = 1)	No but yes if IBD work up is negative (n = 1) Yes (n = 1)	All testing done (n = 1) More abdominal ultrasound and fecal calprotectin (n = 1)
Puerto Rico (n = 1)	Outpatient endoscopy and imaging not available	No	All testing done except limited imaging
Qatar (n = 1)	If steroids required patient would be in isolation. Delay biological therapy	Yes for anyone with severe symptoms presenting to the ED. Rest of milder cases managed by telemedicine only and no COVID-19 testing	All testing done but patients avoiding attending clinics for testing

TABLE 3. Continued

Country	How should one investigate and manage someone presenting with potentially new onset IBD? How is this affected by resource availability?	Considering that at least 5% of persons with COVID-19 present with isolated GI symptoms when a patient with IBD presents with worsening GI symptoms are you routinely testing for COVID-19?	What is the role of noninvasive markers in assessing disease if endoscopy is not available? For example, ESR, CRP, fecal calprotectin, WBC / platelet count, radiology? How does resource availability affect this testing?*
Romania (n = 1)	No change	No	All testing done
Saudi Arabia (n = 1)	No change except for COVID test first	Yes	All testing done
Singapore (n = 1)	No change	No, but yes before biological started	All testing done
South Africa (n = 1)	Avoid endoscopy, steroids and thiopurines	No	All testing done
Sri Lanka (n = 1)	Flexible sigmoidoscopy and biopsy	No	All testing done
Taiwan (n = 1)	No change except for COVID test first	No	All testing done
Thailand (n = 3)	Avoid endoscopy	No	Fecal calprotectin and imaging less available
Uruguay (n = 1)	No change	No	All testing done. Increased use of fecal calprotectin
United Kingdom (n = 1)	Avoid endoscopy; treat empirically	No	All testing done. Fecal calprotectin at home
United States (n = 2)	Endoscopy being done (n = 2). COVID-19 testing first (n = 1) empiric 5ASA(n = 1)	No (n = 1) Yes (n = 1)	All testing done except limited imaging
Vietnam (n = 1)	No change except for COVID test first	No	All testing done

Abbreviations: n refers to number of respondents from that country. “?” refers to unclear response on that question.

4) If an IBD patient develops COVID-19, how does this affect other treatment (Table 2)?

There was consensus to stop or rapidly taper steroids. The slim majority of respondents (30 of 52) would stop or reduce immunomodulatory therapy but responses varied, including some who reported they had yet to experience such cases and did not present a plan in case that occurred. One American suggested continuing ustekinumab and vedolizumab, a respondent from Mexico would continue vedolizumab and budesonide, and a respondent from Taiwan discontinued steroids but maintained other immunomodulatory drugs. Respondents from Saudi Arabia, Singapore, and India suggested the approach to the immunomodulatory drugs would depend on the severity of the COVID-19 infection and the severity of the IBD. One respondent from Malaysia reported continuing usual maintenance therapy, and 1 respondent from Malaysia reported stopping immunomodulatory therapy. When specified, 5-ASA was consistently continued. A respondent from Kuwait reported switching intravenous biological therapy to subcutaneous. A respondent from Pakistan reported that the fear and stigma of testing positive for SARS-CoV-2 infection inhibited patients in his jurisdiction from accessing medical care. Several respondents stated that they had yet to encounter

IBD cases with COVID-19, so they did not state a specific plan of management.

5) What is the role of surgery in the face of COVID-19? Does COVID-19 affect the indications for surgery or the scope of surgical interventions (Table 2)?

Broadly, only urgent surgeries were undertaken. However, in Indonesia, Kenya, Taiwan, and 1 Israeli center (a pediatric center), approaches to surgery did not change, suggesting that elective surgeries in IBD continued. In 1 center each from China, India, Pakistan, and Vietnam, surgery was undertaken after a negative COVID-19 test. It was not clear whether emergency surgery would have been undertaken in these centers in a patient with a positive test, especially if asymptomatic.

6) If in a low resource area and there is no access to biologicals, how does one address steroid use in the current environment of COVID-19 concern (Table 2)?

Some respondents declared avoidance of steroids, but the majority declared selective steroid use and a more rapid taper than usual. The use of steroids in ulcerative colitis (UC) was singled out as more likely. Vietnam, Portugal, 1 of the 2 Pakistani sites, 1 of 4 Chinese sites, and both Israeli sites would

use steroids. Two of the 3 pediatricians answering would use steroids. One clinician from Bangladesh would use steroids after the patient is proven to be COVID-19 negative. A respondent from Kenya stated that if a patient was using steroids, the patient would be kept in isolation. One respondent each from Hong Kong, Korea, Mexico, Myanmar, and Brazil and 2 from Canada and 1 from China would use more locally acting steroids (eg, budesonide).

- 7) How should one investigate and manage someone presenting with potential new onset IBD? How is this affected by resource availability (Table 3)?

Colonoscopy was still being performed for diagnosis of IBD in 1 of 2 US centers, 1 of 2 Indian centers, 1 of 2 Israeli centers, 1 of 2 Malaysian centers, 1 of 2 Pakistani centers, and centers in Canada, Indonesia, Kenya, Korea, Portugal, Romania, Singapore, and Taiwan. In one of the Portuguese centers, there was a preference for imaging and noninvasive testing such as fecal calprotectin. In the Philippines, endoscopy was undertaken in more active cases. In 1 center each in China, Hong Kong, Korea, Saudi Arabia, Taiwan, and Vietnam, endoscopy was only undertaken after negative COVID-19 viral testing. Some centers were avoiding endoscopy even in this scenario of new onset disease, including centers in Brazil, South Africa, Thailand, the UK, and 2 of 4 centers from China, 1 of 2 centers from India, and 1 of 2 centers from Malaysia. In cases of likely colitis, responses from 1 of 2 US centers, 1 of 2 Pakistani centers, and the UK reported use of empiric treatment, particularly with 5-ASA. Canadian respondents reported avoiding intravenous biologicals in favor of subcutaneous dosing when biologicals were being initiated to avoid attendance at in-person infusion clinics. Respondents from Taiwan, Uruguay, Vietnam, and a pediatric center in Israel reported no change in their approach to IBD management.

- 8) Considering that at least 5% of persons with COVID-19 present with isolated GI symptoms when a patient with IBD presents with worsening GI symptoms are you routinely testing for COVID-19 (Table 3)?

Clinicians from 17 countries did not test for COVID-19 on flare of gastrointestinal symptoms. This included both high resource countries like Canada, Korea, and Taiwan and lower resource countries like Vietnam. In Korea and Taiwan, this was a response to the relatively low community prevalence of COVID-19 in their countries. In Canada, though, clinicians did not have open access to testing, so it was limited to persons with respiratory symptoms. Respondents from 8 countries, both low and high resource regions, reported that they routinely tested persons with IBD with new gastrointestinal symptoms. In Brazil, India, Malaysia, Pakistan, Portugal, and the United States, there were those who reported testing and those who did not. Hence, it was not uniform in all countries. Indications for testing have been rapidly changing, so these approaches may have even been

different for those who responded at the beginning of the study period compared with the end of the period of survey collection.

- 9) What is the role of noninvasive markers in assessing disease if endoscopy is not available? For example, ESR, CRP, fecal calprotectin, WBC, platelet count, radiology? How does resource availability affect this (Table 3)?

Blood testing, fecal calprotectin, and imaging were widely performed. However, imaging access was limited in 1 of 4 Brazilian centers, 2 of 3 Canadian centers, both American centers, Puerto Rico, and Thailand. In some Canadian regions, access and funding for fecal calprotectin was limited. In Qatar, patients tended to avoid clinics, and therefore, it was difficult to investigate them. This was also reported in response to question 1 by a South African respondent and in question 6 by an Israeli respondent.

Table 4 shows the number of COVID-19 cases, the number of COVID-19 cases per 1 million people, and the number of COVID-19 tests undertaken as of May 16, 2020.¹⁵

DISCUSSION

The management of persons with IBD across the world in the setting of the COVID-19 pandemic shares many similarities. Gastroenterologists were heeding the recommendations of established gastroenterology bodies with adaptations based on local resources. Of note, gastroenterologists from some high resource countries, such as Canada, and from lower resource countries both reported impediments in access to PPE. Some clinicians reported unique issues limiting patient access to clinics or completing diagnostic testing, such as traffic restrictions in China or patient fear of attending clinics in Israel, Qatar, and South Africa. Some gastroenterologists reported no change in their approaches to IBD patients including no reduction in endoscopy services. This was mostly reported in countries with low COVID-19 patient burdens and was true of both higher and lower resource countries. Most countries had reduced outpatient clinics, reduced outpatient endoscopy and reduced surgery. Several countries retained outpatient endoscopy for persons with IBD as part of management decision-making. Nearly all who responded as to which endoscopies would be allowed reported undertaking endoscopy for urgent IBD scenarios such as active bleeding, severe colitis to assess for infection, certain bowel obstructions, and cancers. Many centers were undertaking endoscopy for new onset IBD to assist with diagnosis. There was near uniform agreement on reducing or avoiding steroid use. Most clinicians reduced or stopped oral immunomodulatory therapy or steroids. However, multiple clinicians from Romania, Singapore, Taiwan, and Uruguay and 1 from Malaysia did not change their management approaches. In the Surveillance Epidemiology of Coronavirus Under Research Exclusion (SECURE)-IBD database, steroid use was associated with worse outcomes in IBD patients who were affected by COVID-19.¹⁶ Others reported not having dealt

TABLE 4. Number of COVID-19 Cases and COVID-19 Tests Done as of May 16 2020¹⁶

Country	Number of COVID-19 cases	COVID-19 Cases/1 million	COVID-19 Tests/1 million
Bangladesh (n = 2)	23,870	145	1125
Brazil (n = 4)	245,595	1156	3464
Canada (n = 3)	78,017	2069	34,816
China (n = 4)	82,954	58	?
France (n = 1)	179,927	2757	21,218
Hong Kong (n = 1)	1056	141	22,470
India (n = 2)	100,340	73	1671
Indonesia (n = 1)	18,010	66	698
Israel (n = 2)	16,643	1927	58,540
Kenya (n = 1)	912	17	836
Korea (n = 1)	11,065	216	14,693
Kuwait (n = 1)	15,691	3681	58,253
Malaysia (n = 2)	6941	215	13,717
Mexico (n = 1)	49,219	382	1338
Myanmar (n = 1)	188	3	268
Nepal (n = 1)	375	13	3450
New Zealand (n = 1)	1499	311	47,892
Pakistan (n = 2)	42,125	191	1754
Philippines (n = 1)	12,718	116	2238
Portugal (n = 2)	29,209	2864	63,969
Puerto Rico (n = 1)	?	?	?
Qatar (n = 1)	33,969	11,816	56,243
Romania (n = 1)	17,036	885	16,290
Saudi Arabia (n = 1)	57,345	1650	17,324
Singapore (n = 1)	28,343	4849	42,132
South Africa (n = 1)	16,433	278	8023
Sri Lanka (n = 1)	992	46	2074
Taiwan (n = 1)	440	18	2914
Thailand (n = 1)	3031	43	4099
UK (n = 1)	246,406	3632	39,543
United States (n = 2)	1,544,557	4670	36,646
Uruguay (n = 1)	734	211	9752
Vietnam (n = 1)	324	3	2828

with a case of COVID-19 in an IBD patient and hence did not respond as to how they would manage that dilemma.

The use COVID-19 testing as part of management approach for persons with IBD was variable. In Taiwan and 1 American center, COVID-19 testing was undertaken before further IBD-related diagnostics; a respondent from Vietnam would test for COVID-19 if changing drug treatment; in Bangladesh, they would only reduce steroids if the patient was COVID-19 positive; and in 1 center each from China, Pakistan, and Vietnam, they would undertake COVID-19 testing before surgery. Of note, when IBD patients had new or increased gastrointestinal symptoms, a minority reported testing for COVID-19. The survey was not structured to determine if this was because the jurisdictions within which

they practiced had limited access to COVID-19 testing or if the clinicians simply thought this was unnecessary. All centers had access to standard blood testing, most had access to fecal calprotectin (including some centers accessing a home version, which facilitated patient isolation practices), and most had usual access to imaging. Some centers (2 in Canada, 1 in the United States, 1 in Bangladesh, and 1 in Thailand) had limited access to cross-sectional imaging. In the case of Canada and the United States, this was deliberate on the part of the health system to reduce patient contact with hospital staff for nonurgent testing.

Table 4 shows the distribution of cases of COVID-19 and of tests for COVID-19 per 1 million inhabitants. One can see that there were several countries with fewer than 400 per 1

million cases; however, there was a marked discrepancy in testing frequency. Testing ranged from 268 out of 1 million inhabitants (Myanmar) to 47,892 out of 1 million inhabitants (New Zealand). Undoubtedly, the experience of respondents was impacted by the burden of disease in their communities. Several had yet to experience cases of IBD in which patients were infected with COVID-19. It will be important to repeat this survey again to determine if views changed as the disease burden changes.

This study had some notable limitations. Clinicians within every country may have different practice approaches so that a survey response from 1 or 2 clinicians does not necessarily reflect what may be done by most clinicians in that country. It is unknown to what extent the responses reflect the majority of gastroenterologists managing IBD patients in each jurisdiction, especially because the respondents were leaders in IBD management in their respective countries. However, even with reports from 1 or 2 clinicians from each country, it allows insight into the uniformity or key differences in the practice of IBD around the world during the COVID-19 pandemic. Though some respondents reported limitations to PPE access or COVID-19 testing, not reporting such limitations does not mean that they did not exist in those jurisdictions. In several countries, there are dual private and publicly funded health care systems. Respondents were not asked to distinguish their answers for each of the 2 systems, although some respondents did report those differences.

In summary, regardless of resources and health care system, gastroenterologists around the world were generally taking a similar approach to the management of IBD. For the most part, they were adhering to published guidelines on IBD management in the COVID-19 era. There were some notable differences in care approach due to reduced service availability, resource availability, and community prevalence of COVID-19. Countries that had 2 or more respondents showed how responses could vary within a country, and so these results should not be taken to reflect a consensus of an entire country's approach to managing IBD.

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