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Incidence and Patterns of COVID-19 Among Inflammatory Bowel Disease Patients From the Nancy and Milan Cohorts



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The first cases of COVID-19 infection were reported in December, 2019, in Wuhan, China. Italy (in particular Lombardy) and France (in particular North-east) have been gravely hit. Both physicians and inflammatory bowel disease (IBD) patients are deeply concerned that immunosuppressants or biologics may increase the risk of COVID-19 infection. International Organization For the Study of Inflammatory Bowel Disease has put in place an international registry, Surveillance Epidemiology of Coronavirus Under Research Exclusion, for tracking all the cases with IBDs infected by COVID-19 (Surveillance Epidemiology of Coronavirus Under Research Exclusion registry: <http://www.covidibd.org>). It will describe the outcomes of infected patients and the association between IBD-related medications and these outcomes.

Immune-mediated inflammatory disorders, including IBD, are known to be associated with changes in host defense. Hence, one could speculate that patients with immune-mediated inflammatory disorders may be more susceptible to COVID-19 infection. However, reports from areas exposed to a high risk of COVID-19 infection interestingly have not reported cases of IBD patients with COVID-19.¹ Ongoing registries cannot address this issue because of the lack of accurate denominator data.

Methods

In a large cohort of IBD patients from France (Nancy University Hospital, 2000 patients) and Italy (Humanitas, Milan, 4000 patients), all consecutive IBD patients infected by COVID-19 were included since the beginning of the pandemic. COVID-19 cases were identified via regular telemedicine visits and infusion center visits. Diagnosis of COVID-19 was made by routinely used polymerase chain reaction nasopharyngeal swab testing for all patients. The cumulative incidence was calculated. The denominator was based on prospectively maintained databases used to identify patients eligible for clinical trials at both centers.

Results

The characteristics of these 15 COVID-19–positive IBD patients are reported in Table 1. Nine patients have Crohn's disease, 3 patients had an active disease, and all but 1 were treated with biological therapy and/or immunosuppressive therapy at the time of the COVID-19 infection diagnosis. Four patients are male, and all but 1 are younger than age 60 years, and 2 patients have comorbidities, including obesity and hypertension, that are considered risk factors for a worse outcome of COVID-19 infection.² Five of 15 patients were hospitalized, but none of them required intensive care and no deaths were reported.

The cumulative incidence of COVID-19–positive IBD patients in our cohort is 0.0025, which is broadly similar to that observed in the general population (current cumulative incidence in France and Italy, 0.0017). By contrast, the mortality rate (13%) and need for intensive care support (6%) are much higher in the general population than in our combined cohort (no cases).

Discussion

A key feature of COVID-19–related acute respiratory distress syndrome is the activation of the immune system characterized by a cytokine storm.³ IBD patients might be protected by the use of potent anti-inflammatory drugs such as anti-tumor necrosis factor therapy and present milder disease or be asymptomatic more frequently than in the general population. Anti-tumor necrosis factor therapy has been associated with a low risk of opportunistic viral infections in a large French administrative database.⁴ Interestingly, no fatalities have been reported in patients undergoing

Abbreviation used in this paper: IBD, inflammatory bowel disease.

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Table 1. Characteristics of IBD Patients With Infection by COVID-19

Patient	Country	Age, y	Sex	Diagnosis	Comorbidity	Disease activity	Therapy	Hospitalization	Intensive care	Death
1	France	37	F	CD	Renal transplantation	Remission	Steroid (5 mg/d), tacrolimus, everolimus, infliximab	Yes	No	No
2	France	34	M	CD	Primary sclerosing cholangitis	Remission	Infliximab	No	No	No
3	France	33	F	CD	Chronic paranoid psychosis	Active	Infliximab	Yes	No	No
4	France	46	F	CD	No	Remission	Infliximab	No	No	No
5	Italy	61	F	UC	Arthrosis, muscular dystrophia	Remission	Infliximab	No	No	No
6	Italy	46	F	UC	Hypertension, obesity	Remission	Vedolizumab	Yes	No	No
7	Italy	49	F	CD	Arthritis	Remission	Ustekinumab	No	No	No
8	Italy	39	F	CD	No	Remission	Adalimumab	No	No	No
9	Italy	26	M	CD	No	Remission	Ustekinumab	No	No	No
10	Italy	53	F	UC	Obesity	Active	Steroid (15 mg/d)	Yes	No	No
11	Italy	28	F	CD	No	Remission	Clinical trial (guselkumab vs ustekinumab vs placebo)	No	No	No
12	Italy	42	F	CD	Ankylosing spondylitis	Remission	Adalimumab	No	No	No
13	Italy	26	F	UC	No	Remission	Mesalamine	No	No	No
14	Italy	28	M	UC	No	Active	Azathioprine	Yes	No	No
15	Italy	38	M	UC	Mitral prolapse	Remission	Infliximab, azathioprine	No	No	No

NOTE. Active disease was determined by a partial Mayo score greater than 2, Harvey-bradshaw index greater than 4 and/or a Mayo score greater than 1, Simple endoscopic score for Crohn's disease greater than 2.

CD, Crohn's disease; F, female; M, male; UC, ulcerative colitis.

transplantation treated with chemotherapy or other immunosuppressive treatments during Severe Acute Respiratory Syndrome coronavirus and Middle East Respiratory Syndrome coronavirus outbreaks.⁵ A similar trend recently was reported during the recent COVID-19 pandemic.^{6,7}

Other hypotheses cannot be excluded. The young age of the IBD population and the low rate of comorbidities, including diabetes, heart disease, and lung disease, known to be associated with a poor outcome during COVID-19 infection,² also may play a role. The European Crohn's and Colitis Organization guidelines recommend vaccination against some viruses, including influenza virus. It has been hypothesized that vaccination may protect against viral infections in general.

In conclusion, we found that IBD patients do not have an increased risk of developing COVID-19 infection and develop less severe forms when infected in a large cohort of 6000 IBD patients treated in referral centers from high-incidence areas.

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Reprint requests

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Conflicts of interest

These authors disclose the following: Mariangela Allocca has received consulting fees from Nikkiso Europe, and lecture fees from Janssen, AbbVie, and Pfizer; Gionata Fiorino has received consultancy fees from Ferring, MSD, AbbVie, Takeda, Janssen, Amgen, Sandoz, Samsung Bioepis, and Celltrion; Silvio Danese has served as a speaker, consultant, and advisory board member for Schering-Plough, Abbott (AbbVie) Laboratories, Merck and Co, UCB Pharma, Ferring, Cellerix, Millenium Takeda, Nycomed, Pharmacosmos, Actelion, Alfa Wasserman, Genentech, Grunenthal, Pfizer, Astra Zeneca, Novo Nordisk, Cosmo Pharmaceuticals, Vifor, and Johnson and Johnson; and Laurent Peyrin-Biroulet has received personal fees from AbbVie, Janssen, Genentech, Ferring, Tillots, Pharmacosmos, Celltrion, Takeda, Boehringer Ingelheim, Pfizer, Index Pharmaceuticals, Sandoz, Celgene, Biogen, Samsung Bioepis, Alma, Sterna, Nestle, Enterome, Allergan, MSD, Roche, Arena, Gilead, Hikma, Amgen, BMS, Vifor, Norgine, Mylan, Lilly, Fresenius Kabi, Oppilan Pharma, Sublimity Therapeutics, Applied Molecular Transport, OSE Immunotherapeutics, Entera, and Theravance, has received grants from AbbVie, MSD, and Takeda, and has received stock options from CTMA. The remaining authors disclose no conflicts.