The Incidence and Outcomes of COVID-19 in IBD Patients: A Rapid Review and Meta-analysis

Key Words: inflammatory bowel disease, Crohn's disease, ulcerative colitis, COVID-19, SARS-CoV-2

To the Editor,

We read with interest the article by Burgueño et al examining the pathophysiology behind lower prevalence of coronavirus disease 2019 (COVID-19) in inflammatory bowel disease (IBD) patients.[1] To better understand the incidence and outcomes of COVID-19 in IBD, we queried the following databases through May 13, 2020: PubMed/Medline, Embase, Cochrane, Web of Science, LitCOVID NIH, and WHO COVID-19 to identify studies reporting data pertaining to COVID-19 in IBD population.

Our search strategy yielded 8 studies for data extraction (Table 1). Of 9177 IBD patients (in 6 studies), 32 were reported to have confirmed COVID-19 (0.3%, 95% confidence interval [CI], 0.1%–0.5%; I^2=50.9%). Five studies reported outcomes in IBD patients diagnosed with COVID-19 (n = 151, mean age 50.5 ± 11.9 years, and males 48.3%). Of these, 63 had Crohn's disease, 84 had ulcerative colitis, and 4 had indeterminate colitis. Regarding active/ongoing therapy for IBD, 16 (10.6%) were on steroids, 59 (39.1%) were on aminosalicylates, 30 (19.9%) were on immunomodulators, and 72 (47.7%) were on biologics. A total of 30 out of 106 patients (28.3%) had active IBD. Of the patients diagnosed with COVID-19 (n = 151), the following outcomes were noted: (1) hospitalization: 40.3% (95% CI, 24.6%–56.1%; I^2 = 68.9%), (2) ICU admission: 8.6% (95% CI, 0.2%–17.0%; I^2 = 72.6%), (3) need for mechanical ventilation (invasive/non-invasive): 10.7% (95% CI, 0.0%–22.0%;

TABLE 1. Characteristics of Included Studies and Baseline Demographics/Outcomes Related to COVID-19 in IBD Population

Study, year	Country	Study period	Total IBD Patients, n	IBD With COVID-19, n	IBD Patients With COVID-19								
					CD	UC	IC	Mean age, (SD)	Male Proportion, n (%)	Hospitalization, n (%)	ICU admission, n (%)	Mechanical Ventilation, n (%)	Death, n (%)
Allocca, 2020	France, Italy	NR	6000	15	9	6	0	39.1 (10.1)	4 (26.7%)	5 (33.3%)	0 (0%)	NR	0 (0%)
Bezzio, 2020	Italy	Mar 11—Mar 29	NR	79	32	47	0	47 (17.9)	44 (55.7%)	22 (27.8%)	11 (13.9%)	11 (13.9%)	6 (7.6%)
Norsa, 2020	Italy	Feb 19—Mar 23	522	0	0	0	0	NR	NR	NR	NR	NR	NR
Rodriguez-Lago, 2020	Spain	Feb 27—Apr 7	NR	40	13	23	4	58.5 (5.7)	24 (60.0%)	21 (52.5%)	0 (0%)	0 (0%)	2 (5.0%)
Taxonera, 2020	Spain	Through Apr 8	1918	12	7	5	0	52.3 (15.4)	3 (25.0%)	8 (66.7%)	4 (33.3)	3 (25.0%)	2 (16.7%)
An, 2020	China	Jan 3—Mar 30	318	0	0	0	0	NR	NR	NR	NR	NR	NR
Grassia, 2020	Italy	NR	251	0	0	0	0	NR	NR	NR	NR	NR	NR
Gubatan, 2020	USA	Mar 4—Apr 14	168	5	2	3	0	70.6 (4.2)	2 (40.0%)	1 (20.0%)	1 (20.0%)	1 (20.0%)	1 (20.0%)

Abbreviation: CD, Crohn's disease; IC, indeterminate colitis; n, number of patients; NR, not reported; SD, standard deviation; UC, ulcerative colitis.

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I^2 = 76.4%), (4) mortality: 6.3% (95% CI, 2.5%–10.1%; I^2 = 0%).

The incidence of COVID-19 in IBD population was approximately 0.3% in our pooled cohort. This is somewhat encouraging, as the incidence is on the lower side compared with the general population (0.2%–4.0%).[2] The somewhat lower incidence is likely due to the lower expression of angiotensin converting enzyme 2 (ACE2) in gastrointestinal epithelial cells, which facilitates viral entry and subsequent infection of the host. Burgueño et al demonstrated that ACE2 is not increased in patients with IBD, and further therapy with immunosuppressants/biologics may decrease the expression of these molecules, resulting in overall reassurance for IBD patients.[1] Bezzio et al argued continuation of therapy in IBD to avoid hospital/clinic visits and suppressing the "cytokine storm" associated with severe COVID-19.[3, 4] Thus, ongoing IBD therapy need not be discontinued in patients during the COVID-19 pandemic.

In conclusion, the current evidence (although weak) does suggest that the IBD population might be somewhat protected in developing COVID-19. The protection is further likely due to ongoing therapy of IBD and should not be discontinued. The incidence, severity, and outcomes related to COVID-19 needs to be compared in future studies for IBD and general population.

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