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Impact of Biologics on SARS-COV-2 Disease Course When Infused Within 2 Weeks of Acquiring the Infection Among IBD Patients

SARS-CoV-2 was first identified in Wuhan in December 2019 and since then it has progressed into a pandemic that evolves continuously. As of May 5, 2022, there have been more than 81 million cases and 994,187 deaths in the United States. Inflammatory bowel disease (IBD) is a chronic inflammatory disorder of the gastrointestinal tract consisting of ulcerative colitis and Crohn’s disease treated with immunosuppressive/immunomodulatory agents. Over the course of the pandemic different aspects of the interaction between SARS-COV-2 and IBD medications have been studied. At the onset of the pandemic there was decreased use of infusible biologics. Despite the passage of time an area that has not been explored is the impact of biologics on the clinical course of SARS-COV-2 when given soon after the detection of infection. Our aim was to determine the impact of biologics on the clinical course of SARS-COV-2 among patients with IBD, when given 1–2 weeks postinfection among stable patients. This is of critical importance because patients may delay getting their scheduled treatment, which in turn could adversely affect their clinical condition.

To achieve our objective, we conducted a retrospective cohort study using data from Veteran Affairs Health System (VAHS). The study period extended from January 20, 2020 to April 18, 2022. Patients with either ulcerative colitis or Crohn’s disease diagnosed before January 20, 2020 were identified using a previously validated algorithm. In this cohort we identified patients who tested positive for SARS-COV-2 via real-time polymerase chain reaction during the study period. Among the patients who tested positive we further identified those who received an infusible biologic within 2 weeks of testing positive for SARS-COV-2. The infusible biologics consisted of infliximab, infliximab-dyyb, infliximab-abda, and vedolizumab. We only evaluated infusible biologics because we could accurately determine their exact date of administration as compared with self-injectables in which this is not possible to ascertain accurately. From the VAHS data repository, we collected demographic data and data on comorbidities. The diagnosis of SARS-COV-2 and infusion of biologics was confirmed by doing individual chart review of every patient. The final cohort comprised of patients with IBD who had stable SARS-COV-2 infection (ie, not requiring home oxygen, medications, or hospitalization) and who received an infusible biologic within 2 weeks of detection of the infection.

None of the patients had symptoms of COVID-19 as documented in the nursing infusion note.

Our outcome of interest was to determine the clinical course of SARS-COV-2 post biologic infusion. We evaluated 4 parameters that could signal worsening of the SARS-COV-2 infection: (1) emergency room visit related to SARS-COV-2, (2) any medication requirement for SARS-COV-2, (3) outpatient oxygen requirement for COVID-19, and (4) hospitalization for COVID-19. To achieve this, all charts were individually reviewed to determine if any of the parameters were met in the 2 weeks following biologic infusion.

After applying the inclusion criteria, a total of 107 patients were included from 58 infusion centers across the country (Table 1). Our cohort comprised of patients who were predominantly male (85%), White (73%), diagnosed with ulcerative colitis (52%), with a median age of 52 years (range, 24–83). Among this group, 42 (40%) patients received an infusion 0–7 days post testing positive for SARS COV-2, and 65 (60 %) received it 8–14 days posttesting. Infliximab and its biosimilars were predominant with 67 patients (63%) on infliximab, 28 (26%) on infliximab abda, and 6 (6%) on infliximab dyyb. Vedolizumab was used by 40 (37%) patients. Most of the patients had some comorbidities, with hypertension and diabetes being the most common.

In assessing the 4 parameters used to evaluate the clinical course of SARS-COV-2 postinfusion, there was no evidence of exacerbation of SARS-COV-2 symptoms in the 2 weeks following infusion. No patient required outpatient medications, home oxygen, an emergency room visit, or hospitalization for the management of SARS-COV-2. Infusible biologics did not seem to impact the clinical course of stable outpatients with SARS-COV-2.

A major strength of our study was the usage of a nationwide cohort of patients with IBD overseen in the VAHS. Because their SARS-COV-2 was detected in the VAHS and they were getting their care including an infusible biologic at regular intervals in the VAHS, we would expect that any worsening of the clinical course of SARS-COV-2 would also be evaluated in the VAHS and...
recorded in the notes. We only looked at infusible biologics to be sure of the exact date of administration as relates to the date of SARS-COV-2 detection. Every chart was individually reviewed by 2 adjudicators and all clinical notes were evaluated. Limitations of this study include external validity considerations because the VA cohort is predominantly composed of older White males. The findings of this study are very reassuring in that they do not detect any signal of worsening of stable SARS-COV-2 when biologics are given soon after the detection of infection. This is important because still more than 80,000 cases are still being detected daily in the United States. Our findings suggest that patients should maintain their scheduled use of biologics in the setting of stable SARS-COV-2 and not delay their infusion. Delays of infusion could possibly lead to worsening of IBD symptoms, or the development of antibodies, and it is best not to have any interruption.

In conclusion, in a nationwide cohort of patients with IBD who had stable SARS-COV-2 and received biologics within 1 or 2 weeks of SARS-COV-2 detection no patient was hospitalized or required outpatient medications for COVID-19. Considering these findings, it would be reasonable for patients with IBD, who are stable after acquiring SARS-COV-2, to continue with their scheduled biologic infusion while further prospective data in larger cohorts are collected.

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Conflicts of interest
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| Table 1. Patient Characteristics | N  | %  |
|---------------------------------|----|----|
| Patients, n                     | 107| 100|
| Age, y                          |    |    |
| Median age                      | 52 |    |
| Range                           | 24.00–83.00 |    |
| Gender                          |    |    |
| F                               | 16 | 15 |
| M                               | 91 | 85 |
| Race                            |    |    |
| White                           | 78 | 73 |
| Black/African American           | 19 | 18 |
| Native Hawaiian or other Pacific Islander | 2 | 2 |
| Unknown/unanswered/declined to answer | 8 | 7 |
| Type of IBD                     |    |    |
| UC                              | 56 | 52 |
| CD                              | 51 | 48 |
| Infusion during Week 1          |    |    |
| Infliximab                      | 27 | 26 |
| Vedolizumab                     | 15 | 14 |
| Infusion during Week 2          |    |    |
| Infliximab                      | 40 | 37 |
| Vedolizumab                     | 25 | 23 |
| Comorbidities                   |    |    |
| Hypertension                    | 50 | 47 |
| Diabetes                        | 29 | 27 |
| Congestive heart failure        | 9  | 8  |
| Chronic pulmonary disease       | 16 | 15 |
| Renal failure                   | 8  | 8  |
| Liver disease                   | 8  | 8  |

CD, Crohn’s disease; IBD, inflammatory bowel disease; UC, ulcerative colitis.