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CASE REPORT

Novel Coronavirus Disease (COVID-19) and Biologic Therapy for Psoriasis: Successful Recovery in Two Patients After Infection with Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)

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ABSTRACT

The outbreak of the novel coronavirus known as SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) causing COVID-19 was first reported in late December 2019. Many patients with psoriasis on biologic therapy have asked their medical providers about the effect of biologics on COVID-19. However, it is currently unknown how biologic therapy for psoriasis might impact patients with psoriasis and COVID-19. In this article, we report on the clinical course of two patients on biologic medication for psoriasis who developed COVID-19 and successfully recovered from SARS-CoV-2 infection. Both patients presented with fever and respiratory symptoms, but neither patient required hospitalization. While more research is needed, it is reassuring to know that successful recovery is possible after COVID-19 infection in patients on biologic therapy for psoriasis.

Keywords: Biologics; COVID-19; Infection; Pandemic; Psoriasis; SARS-CoV-2; Virus

Key Summary Points

Many patients with psoriasis on biologic therapy have asked their medical providers about the effect of biologics on COVID-19. However, it is currently unknown how biologic therapy for psoriasis might impact patients with psoriasis and COVID-19.

We report the clinical course for two patients on biologic medication for psoriasis who developed COVID-19 and successfully recovered from SARS-CoV-2 infection.

While more research is needed, it is reassuring to know that successful recovery is possible after COVID-19 infection in patients on biologic therapy for psoriasis.

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INTRODUCTION

The outbreak of the novel coronavirus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causing novel coronavirus disease

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(COVID-19) was first reported in late December 2019. As of May 24, 2020, there were over 5,370,893 cases and 343,617 deaths worldwide, with these numbers continuing to rise at an alarming rate [1]. Data from 72,314 patients with COVID-19 indicate that 81% of patients have mild disease while the remaining 19% have severe or critical disease [2]. Eleven biologic medications have been approved by the US Food and Drug Administration (FDA) for the treatment of psoriasis and these biologic medications modulate the immune system by inhibiting tumor necrosis factor alpha (TNFα), interleukin-17 (IL-17), or IL-23. Many patients with psoriasis on biologic therapy have asked their medical providers about the effect of biologics on COVID-19. Known risk factors for COVID-19 mortality include increasing age and comorbidities such as cardiovascular disease, hypertension, lung disease, diabetes, and cancer. However, it is currently unknown how biologic therapy for psoriasis might impact patients with psoriasis and COVID-19. In this article, we report two patients on biologic medication for psoriasis who developed COVID-19 and successfully recovered from SARS-CoV-2 infection. Patients provided written informed consent for presentation of de-identified medical data.

CASE REPORTS

Case 1

Patient 1 is an individual in their 30s with widespread plaque psoriasis who was treated with the TNF inhibitor adalimumab for 6 months prior to developing COVID-19. The patient's psoriasis began in childhood and at the time of adalimumab initiation, the patient had 20% body surface area involvement (BSA). The patient's past medical history was significant for sleep apnea, and concomitant medications included trazadone for sleep difficulty and gabapentin for chronic nerve pain. The patient improved on adalimumab 40 mg subcutaneously every other week with a reduction to 3% affected BSA 4 months after initiation. The patient tolerated treatment well, reporting a single upper respiratory tract infection 3 months after starting adalimumab, which lasted only a few days longer than normal.

The patient's initial symptoms of COVID-19 began 4 days after the last adalimumab injection. Symptoms included sore throat (lasting for 5 days), fever to 101.5 °F (lasting 5 days), and mild dry cough (lasting 8 days). The patient denied any diarrhea or loss of smell or taste but did report some non-specific gastrointestinal upset. The patient presented to the emergency department (ED) 4 days after symptom onset, was tested for SARS-CoV-2, and received a positive result in 48 h. The patient was discharged home for self-quarantine and supportive care. The patient contacted our office and we advised to hold adalimumab given the active symptoms.

The patient was recovering well at home and nearly symptom-free, but 2 weeks after symptom onset awoke with shortness of breath, respiratory discomfort, fatigue, and diaphoresis. Of note, the patient had had a fall 2 days prior, striking the left chest. This led to an evaluation in the ED with electrocardiogram, chest radiograph, complete blood count, and comprehensive metabolic panel. The differential diagnosis given in the ED included rib fracture, lower respiratory tract infection, pleuritis, pericarditis, and ongoing COVID-19 infection. Given a normal electrocardiogram, clear lung exam, and normal chest radiograph along with absence of hypoxia/tachypnea/cough, the patient was again sent home for supportive care and was told to return to the ED if high fever, oxygen saturation below 92% (self-monitored with a home oxygen saturation device), or worsening shortness of breath occured. The patient received no treatments for COVID-19 but decided to take calcium and zinc supplements.

Twenty-one days after COVID-19 symptom onset, the patient reported resolution of all symptoms. The patient reported that while the COVID-19 symptoms were similar to previous colds and influenza infections experienced, the COVID-19 symptoms lasted longer. As directed, the patient plans to hold the next dose of adalimumab until being symptom free for 1 month.

Case 2

Patient 2 is an individual in their 40s with generalized plaque psoriasis for over 20 years who had received the IL-12/IL-23 inhibitor ustekinumab for 3 years prior to COVID-19 diagnosis. The patient's dose of ustekinumab was 90 mg every 3 months, which had been increased from 45 mg 2 years prior because of gradually worsening disease. Since starting ustekinumab, the patient has not noticed any differences in frequency of upper respiratory tract infections. The patient does not take other medications and has no significant past medical history.

The patient first noticed symptoms of COVID-19 11 weeks after the last ustekinumab dose. The patient is unsure as to how the illness was contracted as the patient did not have an exposure to a patient with known COVID-19. The patient first experienced a fever of 100.8 °F and fatigue, both lasting 8 days. The day after fever onset, the patient developed shortness of breath, which lasted 7 days. The patient also reported mild nausea for the first 3 days following initial symptoms. The patient denied any loss of smell or taste. The patient was evaluated in the emergency department 2 days after symptoms began and received a positive SARS-CoV-2 result in 24 h.

The patient was not hospitalized for the disease and received no medications for COVID-19. Symptoms were treated at home with rest and acetaminophen, which reduced the fever. The patient reports becoming symptom free 9 days after COVID-19 symptom onset. Compared to prior colds and influenza infections, the patient reports COVID-19 illness lasted about as long. However, with COVID-19, the patient experienced more fatigue and shortness of breath. The patient plans to restart ustekinumab after one full month of being symptom free.

DISCUSSION

The recent COVID-19 pandemic raises the question of how patients with psoriasis receiving biologic therapies fare with this infection. As of 2015, it is estimated that over 300 million patients worldwide have benefited from biologic therapy; thus data on infection course in this population is important to understand [3].

The two patients reported here were younger than age 60 and did not have COVID-19 risk factors such as cardiovascular disease, hypertension, lung disease diabetes, or cancer. Both patients reported COVID-19 symptoms of fever, cough/shortness of breath, and nausea or gastrointestinal symptoms. Neither patient required hospitalization or supplemental oxygen and both did well with supportive therapy. Patient 1, receiving a TNF inhibitor, recovered after approximately 21 days, while patient 2, receiving an IL-12/IL-23 inhibitor, recovered after 9 days. However, as a result of the small number of patients reported here, no firm conclusions can be drawn about the impact of specific therapies on disease outcomes. In terms of hospitalization, Quartuccio et al. studied 5596 patients on biologic therapy with a diagnosis of rheumatoid arthritis, ankylosing spondylitis, psoriatic arthritis, and severe psoriasis. They found that 4.2% were hospitalized because of infection, with upper and lower respiratory tract infections being the most common [4].

While there are no data for how biologic therapy affects patients' risk of acquiring SARS-CoV-2 specifically, data from the Psoriasis Longitudinal Assessment and Registry (PSOLAR) showed that the rates of serious infection were not greater for ustekinumab or etanercept, but higher for adalimumab and infliximab, compared to patients on non-biologic/non-methotrexate psoriasis therapy [5]. The cumulative incidence rate of serious infections was 1.45 per 100 patient-years across treatment cohorts, and the rates were 0.83, 1.47, 1.97, and 2.49 per 100 patient-years in the ustekinumab, etanercept, adalimumab, and infliximab cohorts, respectively, and 1.05 per 100 patient-years in the non-methotrexate/non-biologics cohort. A prospective study from the Association of British Dermatologists Biologic Intervention Register (BADBIR) did not find a significantly higher risk of serious infections for etanercept, adalimumab, and ustekinumab compared with non-biologic therapies for

patients with psoriasis [6]. The incidence rates of serious infections per 1000 person-years were 14.18, 15.25, 13.78, and 15.07 for non-biologic therapy, etanercept, adalimumab, and ustekinumab respectively. Risk factors for contracting a serious infection while on biologic therapy included female gender, the presence of comorbidities such as chronic obstructive pulmonary disease (COPD), alcohol use, infliximab use, and retired patients [7]. Furthermore, an analysis of pivotal clinical trials and long-term registry data reveal that on the whole, psoriasis biologics do not show substantial increases in infection risk compared to placebo [8].

An area of open investigation is whether immunomodulators may be beneficial to prevent tissue damage caused by the inflammatory response to SARS-CoV-2. A study of 522 patients with COVID-19 from China revealed elevated serum TNFα, IL-6, and IL-10 in those patients with more severe disease [9]. Currently, there are clinical trials underway investigating adalimumab [10], the JAK inhibitor ruxolitinib [11], and IL-6 inhibitors for the mitigation of cytokine storm in patients with COVID-19 [12, 13]. However, it is important to note that these trials are primarily targeting patients with established, severe COVID-19 disease, and the results may not translate into understanding the effect of these immunomodulatory agents on SARS-CoV-2 acquisition or in patients with mild COVID-19 disease.

CONCLUSION

These two cases add to the existing literature on infection and biologic therapy for psoriasis given that little is known about the pathogenicity of SARS-CoV-2 in patients on biologic therapy for psoriasis. This article describes two patients who contracted COVID-19 on biologic therapy for psoriasis and successfully recovered. These two patients experienced fever, respiratory symptoms, and gastrointestinal symptoms but did well with supportive therapy without the need for hospitalization. It is important for patients on biologic therapy for psoriasis to have informed conversations with their healthcare providers regarding risks and benefits of continuing or starting treatment. While more research is needed, it is reassuring to know that successful recovery is possible after COVID-19 infection in patients on biologic therapy for psoriasis.

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Compliance with Ethics Guidelines. Patients provided written informed consent for presentation of de-identified medical data.

Data Availability. Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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