# SARS-CoV-2 Virus on Psoriasis

Subjects: Dermatology

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Biological treatment is an important and effective therapy for psoriasis. During the COVID-19 pandemic, it remains unclear whether this type of therapy affects the course of SARS-CoV-2 infection. The aim of the study was to observe patients with psoriasis undergoing biological or other systemic treatment in relation to the impact of SARS-CoV-2 infection on the course of psoriasis and the COVID-19 disease itself. Materials and methods: A one-year observational study included 57 patients with diagnosed psoriasis who qualified for biological treatment and a group of 68 similar patients who were administered a different systemic treatment. Patients were analyzed monthly for psoriasis (including Psoriasis Area Severity Index (PASI) assessment) and constantly for SARS-CoV-2 infection (telephone contact). Cases of COVID-19 were confirmed by Polymerase Chain Reaction (PCR) at the study center. Results: SARS-CoV-2 infection was confirmed by a positive Real Time Polymerase Chain Reaction (RT-PCR) test in eight patients (14.0%) with psoriasis on biological therapy. None of the cases in this group required hospitalization for COVID-19. Similar data were obtained in the control group. Specifically, 11 (16%) patients were confirmed to be infected with SARS-CoV-2. These results were statistically comparable ($p > 0.05$). In the group of patients undergoing biological treatment, six (75%) of eight patients developed an exacerbation of psoriasis during SARS-CoV-2 infection, and similar results were noted in the control group, with eight (72%) patients experiencing an exacerbation of psoriasis. Conclusions: Patients with psoriasis who were administered biological treatment or other systemic therapy may experience a mild course of SARS-CoV-2 infection but might also experience a temporary exacerbation of skin lesions.

psoriasis psoriatic arthritis COVID-19 biological drugs

## 1. Introduction

Psoriasis is a chronic, immune-mediated inflammatory skin disease. It is estimated that approximately 5–30% of patients with psoriasis vulgaris suffer from psoriatic arthritis (PsA) [1]. Psoriasis treatment includes the use of external preparations and systemic medications [1]. The use of biological drugs represents an important breakthrough in the treatment of psoriasis. These drugs inhibit effector cytokines, such as TNF-alpha, IL-12, IL-17, and IL-23, that play a key role in the pathomechanism of psoriasis [2].

Coronavirus disease (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first cases were reported in Wuhan, China, in December 2019 [3]. This new virus has spread rapidly to many countries, and the ongoing SARS-CoV-2 pandemic presents us with new diagnostic and therapeutic challenges. Patients with severe psoriasis require the use of biologics to control disease severity, but it is unclear whether the achieved immunosuppression increases the risk of SARS-CoV-2 infection [4]. The aim of this study was to monitor patients with severe psoriasis who were administered biological therapy during the COVID-19 pandemic. Two key questions of this study were as follows: could the use of biological drugs have an impact on the course of COVID-19 infection? Could the use of biological drugs prevent symptomatic/asymptomatic SARS-CoV-2 infection?

## 2. Analysis on Results

In the group of patients under biological treatment, SARS-CoV-2 infection was confirmed by a positive RT-PCR test in eight patients (14.0%). All of these patients had mild clinical symptoms, including anosmia, cough, mild breathing difficulties, and fever. Hospitalization due to COVID-19 did not occur in this group. Similar data were obtained in the control group: 11 (16%) patients were confirmed to be infected with SARS-CoV-2. In this group, only mild disease was observed, and hospitalization was not required for any patient. These results were statistically comparable ($p > 0.05$). In the group of patients undergoing biological treatment, six (75%) of eight patients developed an exacerbation of psoriasis during SARS-CoV-2 infection (example of a patient before and immediately after SARS-CoV-2 infection: **Figure 1** and **Figure 2**). A similar relationship was observed in the control group, in which 8 (72%) of 11 patients with SARS-CoV-2 infection experienced an exacerbation of psoriasis. Detailed data are presented in **Table 1**. In any described patients, psoriasis therapy was not suspended in the case of SARS-CoV-2 infection. In all patients with an exacerbation of psoriasis, the condition resolved within 4–6 weeks from the diagnosis of COVID-19 and did not require intensification of systemic treatment (local treatment was increased), with the exception of two patients on cyclosporin for whom the dose was temporarily increased (4–6 weeks) by 50%. There was no situation in which the patients themselves modified their psoriasis treatment.

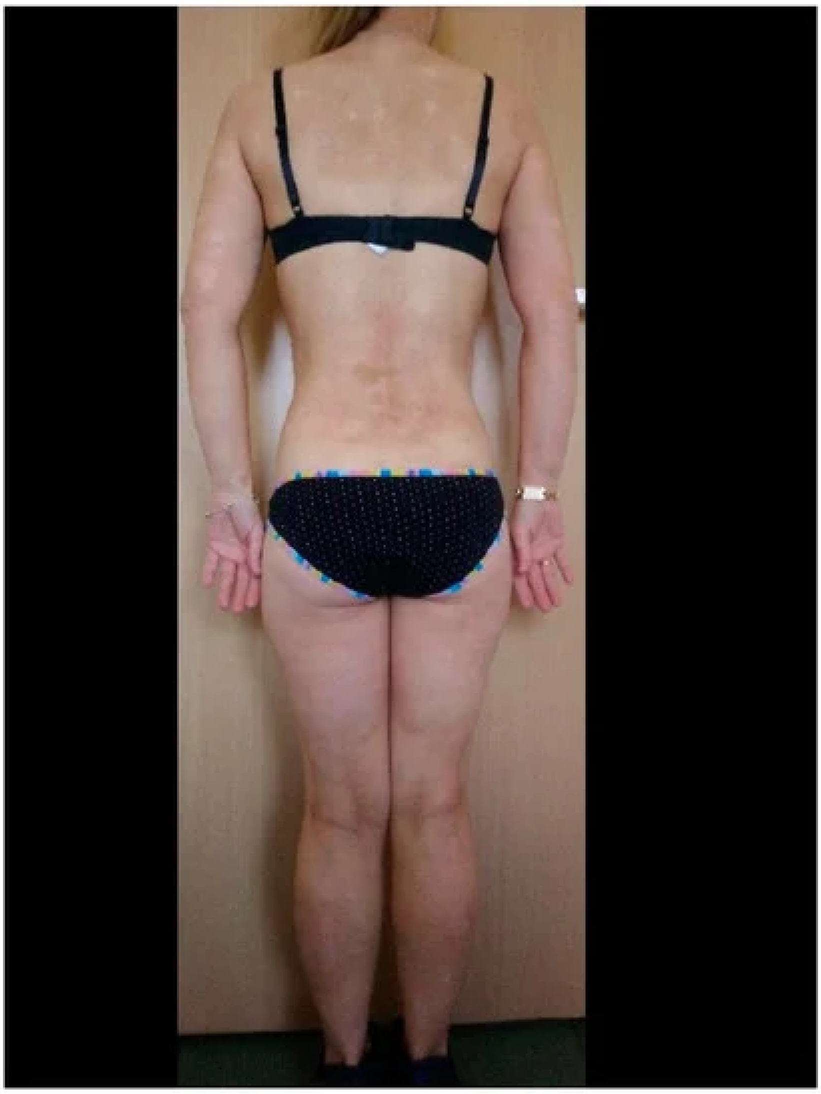

**Figure 1.** Patient before COVID-19 during biological therapy.

**Figure 2.** The same patient just after SARS-Co-V-2 infection.

**Table 1.** Characteristics of psoriasis patients who developed SARS-CoV-2 infection.

| N S/C | Sex | Age | Type of Psoriasis According to ICD-10 | Drug Name | Exacerbation of Psoriasis PASI Score before vs. after | Concomitant Diseases | Time of Exacerbation (days) |
|---|---|---|---|---|---|---|---|
| 1S | M | 72 | L40.0 | adalimumab | No<br>32–28 | Arterial hypertension | - |
| 2S | M | 60 | L40.0 | secukinumab | No<br>29–31 | - | - |
| 3S | W | 50 | L40.0 | ustekinumab | Yes<br>4–64 | Obesity | 12 |
| 4S | M | 44 | L40.0 | ustekinumab | Yes<br>23–51 | - | 24 |

| N S/C | Sex | Age | Type of Psoriasis According to ICD-10 | Drug Name | Exacerbation of Psoriasis PASI Score before vs. after | Concomitant Diseases | Time of Exacerbation (days) |
|---|---|---|---|---|---|---|---|
| 5S | W | 43 | L40.5 | adalimumab | Yes<br>18–33 | - | 28 |
| 6S | M | 50 | L40.0 | risankizumab | Yes<br>4–31 | Arterial hypertension | 28 |
| 7S | W | 52 | L40.0 | ustekinumab | Yes<br>8–44 | - | 21 |
| 8S | W | 52 | L40.0 | adalimumab | Yes<br>15–25 | - | 36 |
| 1C | M | 51 | L40.5 | cyclosporin | No<br>17–15 | - | - |
| 2C | M | 42 | L40.5 | PUVA | Yes<br>32–46 | Arterial hypertension | 24 |
| 3C | M | 45 | L40.0 | cyclosporin | Yes<br>28–39 | - | 38 |
| 4C | W | 62 | L40.0 | PUVA | Yes<br>12–54 | - | 42 |
| 5C | W | 55 | L40.0 | cyclosporin | No<br>19–42 | - | - |
| 6C | M | 54 | L40.5 | cyclosporin | Yes<br>33–63 | Arterial hypertension | 32 |
| 7C | M | 46 | L40.0 | methotrexate | No<br>8–7 | - | - |
| 8C | W | 69 | L40.0 | methotrexate | Yes<br>5–26 | Diabetes<br>Arterial hypertension | 25 |
| 9C | M | 38 | L40.0 | cyclosporin | Yes<br>9–52 | - | 60 |
| 10C | M | 44 | L40.0 | PUVA | Yes<br>12–33 | - | 24 |
| 11C | W | 49 | L40.0 | methotrexate | Yes<br>25–38 | - | 32 |

Legend: S—study group, C—control group, M: man, W: woman.

## 3. Current Insights

With the onset of the COVID-19 pandemic, there were alarming case reports of exacerbation of psoriasis after SARS-CoV-2 infection in patients not being treated with biological therapy [5][6][7].

The impact of SARS-CoV-2 infection on biologically treated patients with moderate to severe psoriasis is currently unclear. The primary immune response is satisfactory and leads to a decrease in viral load. Unfortunately, for reasons that remain unclear, the secondary immune response (the so-called “cytokine storm”) may be excessive and may be a factor leading to tissue integrity disorders, respiratory failure, or exacerbation of skin lesions. We cannot exclude the notion that biologics may reduce the production of pro-inflammatory cytokines, thereby reducing the negative impact of COVID-19 on the symptoms of psoriasis [5][6][7][8][9][10].

The presented work documents that all patients undergoing biological treatment had a mild course of COVID-19 and did not require hospitalization. Earlier studies also confirmed that the use of biological drugs by patients with psoriasis was associated with a much lower risk of hospitalization, although other factors, such as a patient’s age or comorbidities, should not be overlooked [11][12][13]. The current Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) guidelines recommend that biological treatments for psoriasis and psoriatic arthritis should not be discontinued or reduced during the pandemic, or when SARS-COV-2 virus infection is diagnosed. Research indicates that inappropriate treatment modification or discontinuation of treatment may worsen symptoms and reduce the response to re-treatment [14][15].

There are no conclusive data on the safety of initiating biological therapy in patients with psoriasis. In addition, a joint decision by a patient and their physician on the initiation of treatment is recommended, given that delayed treatment of psoriasis can seriously affect a patient’s physical and mental health [14][15][16].

The observed control group reacted in a similar manner to SARS-CoV-2 infection as patients on biological treatment. Specifically, no severe cases of COVID-19 and no cases requiring hospitalization were noted in either group. All patients were only symptomatically treated and did not require systemic steroids, heparin, or oxygen therapy. The patients only used antipyretic drugs.

None of our patients modified or suspended psoriasis treatment during SARS-Co-V-2 infection, and this excludes any additional impact on the course of psoriasis during COVID-19. This is different from other observations in which patients themselves decided to change or suspend such treatment [17]. It should be emphasized that, in the studied group of patients, a smaller than expected effect was observed in several patients after one year of biological treatment, which was often due to poor adherence (limitations related to the COVID-19 pandemic). It seems that completely uncontrolled psoriasis in individual patients could lead to instability during SARS-Co-V-19 infection.

It can be assumed that the transient exacerbations of psoriasis are associated with viral infection as a non-specific factor, which is similar to what is often observed with other infections in patients with psoriasis. However, due to the small study group, it was difficult to assess the impact of drugs on the course of SARS-CoV-2 infection. This is a significant limitation of this study. However, a similar observational study in patients with atopic dermatitis and immunosuppressive therapy also found no effect on the severity of COVID-19 [18]. The possible negative effects of this type of therapy should be emphasized. In the case of biological treatment, there are indications of an increased risk of infection in adult psoriasis patients treated with biological drugs. An analysis of data from 11,466 adults with psoriasis in the Psoriasis Longitudinal Assessment and Registry revealed an increased risk of serious infections with adalimumab and infliximab compared with and without non-biological systemic therapy. The rates of serious infections among patients treated with infliximab, adalimumab, etanercept, and ustekinumab were 2.49, 1.97, 1.47, and 0.83 per 100 patient-years, respectively [19]. No similar infections were recorded in the follow-up.

## References


1. Braun-Falco, O.; Burgdorf, W.H.C.; Plewig, G.; Wolff, H.H.; Landthaler, M. Dermatology. In Psoriasis, 3rd ed.; Springer: Heidelberg, Germany, 2009.
2. Armstrong, A.W.; Read, C. Pathophysiology, Clinical Presentation, and Treatment of Psoriasis: A Review. JAMA 2020, 323, 1945–1960.
3. Hu, B.; Guo, H.; Zhou, P.; Shi, Z.L. Characteristics of SARS-CoV-2 and COVID-19. Nat. Rev. Microbiol. 2021, 19, 141–154.
4. Conforti, C.; Giuffrida, R.; Dianzani, C.; Di Meo, N.; Zalaudek, I. COVID-19 and psoriasis: Is it time to limit treatment with immunosuppressants? A call for action. Dermatol. Ther. 2020, 33, e13298.
5. Nasiri, S.; Araghi, F.; Tabary, M.; Gheisari, M.; Mahboubi-Fooladi, Z.; Dadkhahfar, S. A challenging case of psoriasis flare-up after COVID-19 infection. J. Dermatol. Treat. 2020, 31, 448–449.
6. Kutlu, Ö.; Metin, A. A case of exacerbation of psoriasis after oseltamivir and hydroxychloroquine in a patient with COVID-19: Will cases of psoriasis increase after COVID-19 pandemic? Dermatol Ther. 2020, 33, e13383.
7. Ozaras, R.; Berk, A.; Ucar, D.H.; Duman, H.; Kaya, F.; Mutlu, H. Covid-19 and exacerbation of psoriasis. Dermatol. Ther. 2020, 33, e13632.
8. Zhao, M. Cytokine storm and immunomodulatory therapy in COVID-19: Role of chloroquine and anti-IL-6 monoclonal antibodies. Int. J. Antimicrob. Agents 2020, 55, 105982.
9. Talamonti, M.; Galluzzo, M.; Chiricozzi, A.; Quaglino, P.; Fabbrocini, G.; Gisondi, P.; Marzano, A.V.; Potenza, C.; Conti, A.; Parodi, A.; et al. Characteristic of chronic plaque psoriasis patients treated with biologics in Italy during the COVID-19 Pandemic: Risk analysis from the PSO-BIO-COVID observational study. Expert Opin. Biol. Ther. 2021, 21, 271–277.

10. Camela, E.; Fabbrocini, G.; Cinelli, E.; Lauro, W.; Megna, M. Biologic Therapies, Psoriasis i COVID-19: Our Experience at the Psoriasis Unit of the University of Naples Federico II. Dermatology 2021, 237, 13–14.
11. Mahil, S.K.; Dand, N.; Mason, K.J.; Yiu, Z.Z.; Tsakok, T.; Meynell, F.; Coker, B.; McAteer, H.; Moorhead, L.; Mackenzin, T.; et al. Factors associated with adverse COVID-19 outcomes in patients with psoriasis-insights from a global registry-based study. J Allergy Clin. Immunol. 2021, 147, 60–71.
12. Attauabi, M.; Seidelin, J.B.; Felding, O.K.; Wewer, M.D.; Arp LK, V.; Sarikaya, M.Z.; Egebergd, A.; Vladimirovae, N.; Bendtsenab, F.; Burischab, J. Coronavirus disease 2019, immune-mediated inflammatory diseases and immunosuppressive therapies—A Danish population-based cohort study. J. Autoimmun. 2021, 118, 102613.
13. Polat Ekinci, A.; Pehlivan, G.; Gökalp, M.O. Surveillance of psoriatic patients on biologic treatment during the COVID-19 pandemic: A single-center experience. Dermatol Ther. 2021, 34, e14700.
14. Mease, P.J.; Calabrese, L.H.; Duffin, K.C.; Haberman, R.H.; Firmino, R.; Scher, J.U.; Schick, L.; Winthrop, K.; Merola, J.F. Psoriasis and Psoriatic Arthritis in the Context of the COVID-19 Pandemic: A Plenary Session from the GRAPPA 2020 Annual Meeting. J. Rheumatol. 2021.
15. Announcement of the Polish Society of Rheumatology and the National Consultant in the Field of Rheumatology for Patients and Doctors in Connection with the Spreading COVID-19 Infection Based on the Eular Guidelines of 17/03/2020. Available online: https://www.eular.org/recommendations_management.cfm (accessed on 1 March 2021).
16. Gelfand, J.M.; Armstrong, A.W.; Bell, S.; Anesi, G.L.; Blauvelt, A.; Calabrese, C.; Dommasch, E.D.; Feldman, S.R.; Gladman, D.; Kircik, L.; et al. National Psoriasis Foundation COVID-19 Task Force Guidance for Management of Psoriatic Disease during the Pandemic: Version 1. J. Am. Acad. Dermatol. 2020, 83, 1704–1716.
17. Talamonti, M.; Galluzzo, M.; Chiricozzi, A.; Quaglino, P.; Fabbrocini, G.; Gisondi, P.; Marzano, A.; Potenza, C.; Conti, A.; Parodi, A.; et al. Management of biological therapies for chronic plaque psoriasis during COVID-19 emergency in Italy. Eur. Acad. Dermatol. Venereol. 2020, 34, e770–e772.
18. Miodońska, M.; Bogacz, A.; Mróz, M.; Mućka, S.; Bożek, A. The Effect of SARS-CoV-2 Virus Infection on the Course of Atopic Dermatitis in Patients. Medicina 2021, 22, 521.
19. Kalb, R.E.; Fiorentino, D.F.; Lebwohl, M.G.; Toole, J.; Poulin, Y.; Cohen, A.D.; Goyal, K.; Fakharzadeh, S.; Calabro, S.; Chevrier, M.; et al. Risk of Serious Infection with Biologic and Systemic Treatment of Psoriasis: Results from the Psoriasis Longitudinal Assessment and Registry (PSOLAR). JAMA Dermatol. 2015, 151, 961.