



## COVID-19 and psoriasis: a concise systematic review

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### Abstract

**Introduction:** The effects on human health caused by the severe acute respiratory syndrome of coronavirus 2 (SARS-CoV-2) lead to hyperinflammation processes, which can lead to meta-inflammation. This process can aggravate skin diseases, especially psoriasis. This is a chronic inflammatory skin disease associated with significant morbidity. This problem affects about 2-3% of people worldwide. **Objective:** to demonstrate, through a concise systematic review, the main considerations about the relationship between COVID-19 and psoriasis, showing the possible mechanisms for the worsening of this dermatological disease. **Methods:** The research was carried out from June 2021 to July 2021 and developed based on Scopus, PubMed, Science Direct, Scielo, and Google Scholar, following the Systematic Review-PRISMA rules. The quality of the studies was based on the GRADE instrument and the risk of bias was analyzed according to the Cochrane instrument. **Results:** Psoriasis is a common chronic inflammatory skin disease and is autoimmune. Patients with COVID-19 may have features of hyper inflammation and even meta-inflammation. The triggering or exacerbating factor of psoriasis may be medications and, in addition, patients with COVID-19 may have psoriasis exacerbation. Reports indicated that psoriasis patients using biological products were no longer susceptible to COVID-19 and

the severe clinical course of the disease. It is envisioned that the use of azithromycin in cases of COVID 19 with pre-existing psoriasis can alleviate psoriatic lesions. **Conclusion:** The COVID 19 pandemic had a direct impact on dermatological diseases, especially psoriasis. Difficulty in accessing health care services and the stress load caused exacerbations in psoriasis cases. Studies recommend avoiding classic immunosuppressive agents such as methotrexate, cyclosporine, and TNF alpha inhibitors. Reports indicated that psoriasis patients using biological products were no longer susceptible to COVID-19 and the severe clinical course of the disease.

**Keywords:** COVID-19. SARS-CoV-2. Psoriasis. Dermatological diseases. Hyperinflammation. Meta-inflammation.

### Introduction

In the COVID-19 pandemic scenario, the effects on human health caused by the severe acute respiratory syndrome of coronavirus 2 (SARS-CoV-2) lead to hyperinflammation processes, which can lead to meta-inflammation [1]. This process can aggravate dermatological diseases, especially psoriasis [2,3]. This is a chronic inflammatory skin disease associated with significant morbidity [4]. This problem affects about 2-3% of people worldwide [5,6].

In this regard, COVID-19 is a highly contagious respiratory infection caused by SARS-CoV-2. The

pandemic has affected the treatment of psoriasis and an increasing number of studies in the current literature have focused on the relationship between psoriasis and COVID-19 from different perspectives. In this sense, conventional immunosuppressive therapies, such as methotrexate and cyclosporine, and anti-tumor necrosis factor agents should not be preferred due to the increased risk of infection, especially in high-risk areas. The use of cyclosporine may pose additional risk due to the side effect of hypertension. The treatment approach must be personalized, considering the advantages and disadvantages of each case separately [7,8].

In this context, primary and appendage mucocutaneous presentations can be the initial or evolutionary signs of COVID-19. It may most commonly present as an exanthatic or morbilliform maculopapular eruption, generalized urticaria, or pseudoflowering (pernio-like acral lesions or vasculopathy eruptions). Studies show that patients with active COVID-19 infection should maintain biological immunosuppressants or not until complete recovery occurs, in at least 4 weeks [9].

Also, the COVID 19 pandemic changed the approach for all patients who need close contact during a dermatological consultation. The world's health systems were overwhelmed, and many centers were unable to serve a large number of patients. Thus, patients with psoriasis had only limited access to necessary health care [10,11].

Therefore, the present study aimed to highlight, through a concise systematic review, the main considerations about the relationship between COVID-19 and psoriasis, showing the possible mechanisms for the aggravation of this dermatological disease.

## Methods

### Study Design

The rules of the Systematic Review-PRISMA Platform (Transparent reporting of systematic reviews and meta-analysis-[HTTP://www.prisma-statement.org/](http://www.prisma-statement.org/)) were followed [12].

### Data sources and research strategy

The search strategies for this systematic review were based on the keywords (MeSH Terms): "*COVID-19. SARS-CoV-2. Psoriasis. Dermatological diseases. Hyperinflammation. Meta-inflammation*". The research was carried out from June 2021 to July 2021 and developed based on Scopus, PubMed, Science Direct, Scielo, and Google Scholar. Also, a combination of the keywords with the booleans "OR", "AND", and the operator "NOT" were used to target the scientific articles

of interest.

### Study Quality and Bias Risk

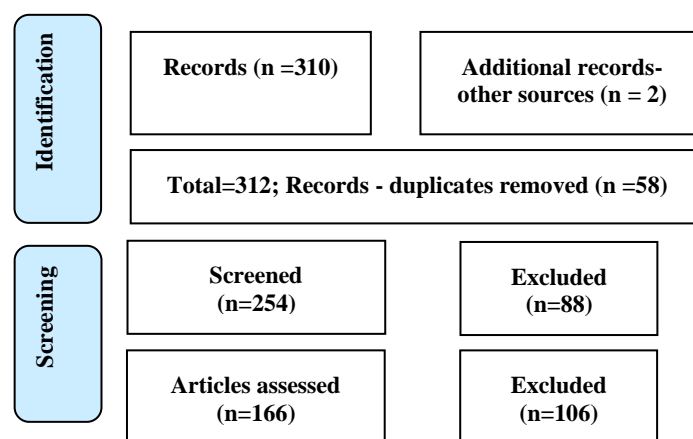
The quality of the studies was based on the GRADE instrument [13] and the risk of bias was analyzed according to the Cochrane instrument [14]. Two independent reviewers carried out research and study selection. Data extraction was performed by reviewer 1 and fully reviewed by reviewer 2. A third investigator decided on some conflicting points and made the final decision to choose the articles.

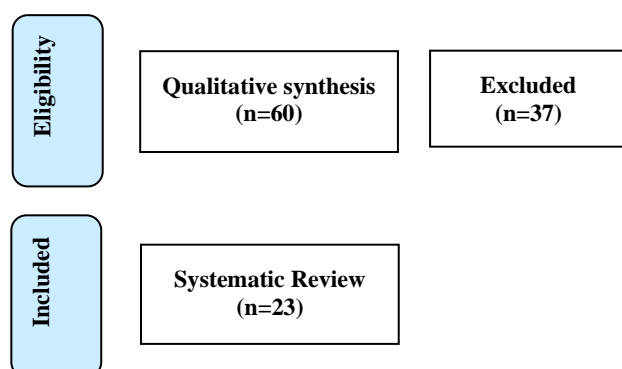
## Results and Development

After the selectivity of articles and literary findings through the following descriptors *COVID-19, SARS-CoV-2, Psoriasis, Dermatological diseases, Hyperinflammation, Meta-inflammation*, a total of 312 studies were analyzed, with only 23 medium and high-quality studies selected, according to the rules of the GRADE, and with bias risks that do not compromise scientific development, based on the Cochrane instrument (**Figure 1**).

After a complete analysis of the selected articles, it was found that psoriasis is a common chronic inflammatory skin disease, being autoimmune. A review study examined the overall infection risks of non-biological and biological systemic drugs for psoriasis. Thus, in patients with active infection, conventional systemic drugs such as tofacitinib and biological products for psoriasis should be temporarily discontinued. In uninfected patients, switching to safer alternatives should be considered. Interleukin (IL)-17, IL-12/23, and IL-23 inhibitors are associated with a low risk of infection, with IL-17 and IL-23 favored over IL-12/23 inhibitors. Furthermore, studies suggest that IL-17 and IL-23 blockers are safer than tumor necrosis factor alpha-blockers. The drugs apremilast, acitretin, and dupilumab have favorable safety data and can be safely started and continued in uninfected patients [15].

**Figure 1.** Scheme for selecting the stud





In this context, it is known that psoriasis is an immune-mediated genetic disease. Patients with COVID-19 may have features of hyper inflammation and even meta-inflammation. The triggering or exacerbating factor of psoriasis can be medications and, in addition, patients with COVID-19 may have psoriasis exacerbation [16].

Therefore, there is concern about the susceptibility of patients with psoriasis to the use of biological products in the presence of COVID-19. Another review study examined whether biological treatment of psoriasis increases the risk of SARS-CoV-2 infection and whether biological products affect the clinical course of COVID-19 in these patients. According to 8,769 medical reports, about 0.3% of patients with psoriasis had COVID-19 and the hospitalization rate was 0.1%. No deaths due to COVID-19 were reported among 10509 patients. Reports indicated that psoriasis patients using biological products were no longer susceptible to COVID-19 and the severe clinical course of the disease [17].

In addition, one study found that the association of restriction of outdoor activities and loss of income with patient-reported outcomes of psoriasis during the COVID-19 pandemic, approximately 43.7% of 926 patients described moderate to very marked worsening of psoriasis. Furthermore, the limitation of outdoor activity was found to be positively correlated with the worsening of psoriasis, stress and anxiety, and depression [18].

Therefore, the impact of COVID 19 on the course of psoriasis promotes hyperinflammation. Inflammation biomarkers such as C-reactive protein and ferritin were found to be significantly elevated in patients with Covid-19 [19]. In their series of 52 patients, Kutlu and Metin found that 9.6% of patients with COVID-19 who were previously admitted to a dermatology clinic had psoriasis. This points out that patients with psoriasis may be more vulnerable to COVID 19 [20]. Furthermore, Ozaras et al reported a case of psoriasis possibly aggravated by COVID 19 [21]. In this context, it has been shown that psoriasis can be aggravated by the use of hydroxychloroquine. As evidence, the authors Kutlu and Metin reported a 71-year-old patient with COVID-19 who

had a worsening of psoriasis after using hydroxychloroquine and oseltamivir [22].

In this sense, it is understood that hydroxychloroquine can increase the production of IL-17, resulting in increased growth of keratinocytes [23]. Furthermore, Sachdeva et al identified 18 cases of psoriasis affected by hydroxychloroquine. Of the 18 cases, 50.0% had new-onset psoriasis, 27.8% experienced a worsening of psoriatic lesions, and 22.2% had relapsed psoriasis. Despite this, a single-blind randomized controlled trial showed that azithromycin may be a potential therapeutic option for chronic plaque psoriasis through its immunomodulatory effect on epidermal Langerhans cells and keratinocytes [24]. Thus, it is seen that the use of azithromycin in cases of COVID 19 with pre-existing psoriasis can alleviate psoriatic lesions.

In this setting, a study updated guidelines on the management of psoriatic disease during the COVID-19 pandemic. The Task Force (TF) updated the evidence for the 22 original statements and added 5 new recommendations. The statements guide the treatment of patients with the psoriatic disease on topics including how the disease and its treatments affect the risk of COVID-19, how medical care can be optimized during the pandemic, what patients should do to decrease the risk of infection with COVID-19, including re-vaccination, and what they should do if they contract COVID-19 [25].

Furthermore, one study characterized the evolution of COVID-19 in patients with psoriasis. Of 374 physician-reported patients in 25 countries, 71% were receiving a biologic, 18% were receiving a non-biological, and 10% were not receiving any systemic psoriasis treatment. In all, 348 patients (93%) fully recovered from COVID-19, 77 (21%) were hospitalized and 9 (2%) died. The increased risk of hospitalization was associated with age, male gender, non-white ethnicity, and comorbid chronic lung disease. Still, hospitalization was more frequent in patients using non-biological systemic therapy than in those using biologicals [26].

## Conclusion

The COVID 19 pandemic directly impacted dermatological diseases, in particular psoriasis. Difficulty in accessing health care services and the stress load caused exacerbations in psoriasis cases. Studies recommend avoiding classic immunosuppressive agents such as methotrexate, cyclosporine, and TNF alpha inhibitors. Reports indicated that psoriasis patients using biological products were no longer susceptible to COVID-19 and the severe clinical course of the disease.

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The authors declare no conflict of interest

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