

## ORIGINAL RESEARCH

### Dermatologists' attitude towards psoriasis treatment during the COVID-19 pandemic

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#### Abstract

**Background:** The COVID-19 pandemic introduced new challenges in several dimensions in healthcare services. Herein, we describe the real-life strategies and therapeutic options adopted by dermatologists regarding their patients with psoriasis being treated with or with an indication for systemic therapy during the first COVID-19 lockdown period in Portugal.

**Methods:** The study involves a web-based survey on the clinical management of systemic therapy for psoriasis during the COVID-19 pandemic administered to Portuguese dermatologists. The survey consisted of 55 questions (4 open-ended questions; 51 closed-ended questions), grouped into 6 sections.

**Results:** A total of 60 dermatologists voluntarily participated in this survey. Nearly 63% of the participants opted for suspending biologics during the COVID-19 lockdown period and 23.3% increased the time between drug administrations. Eighty percent of the participants agreed that biologics did not change the probability of acquiring COVID-19 and 58.4% believed that these drugs decreased or did not change the severity of the disease. Approximately one-third of the participants opted not to prescribe a biological agent in patients despite

clinical indication over the duration of the pandemic. Nearly 25% of the participants opted for suspending traditional immunosuppressant administration. Virtual appointments were an option for 93.3% of the participants.

**Conclusion:** The COVID-19 pandemic has significantly affected the management of patients with psoriasis being treated with or with an indication for systemic therapy. Some of the decisions made during the first lockdown period were contrary to what we know today. These decisions might have had a significant impact on patients' quality of life and on future therapeutic success. An adequate interpretation and analysis of the available data will be extremely important to an insightful adaptation of the clinical practice in future confinement or restrictive scenarios.

**Keywords:** biological agents, COVID-19, dermatology, immunosuppression, psoriasis.

#### Citation

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## Background

Over the last year, the COVID-19 pandemic has completely changed the structure and organization of society in all dimensions.<sup>1</sup> The infection, caused by SARS-CoV-2, was first recognized by its respiratory impairment, although other target

organ consequences have been subsequently identified.<sup>2</sup> Since December 2019, when the virus was first identified in China, there have been marked advances in knowledge regarding the disease and its multiorgan involvement as well as of the short-term and long-term management of patients with the disease.<sup>2</sup>

The COVID-19 pandemic has reshaped several healthcare dimensions. In an attempt to mitigate the spread of the virus, healthcare systems have had to adapt their framework to decrease the risk of infection in healthcare settings, thus limiting in-person visits to the emergent situations. The avoidance of healthcare environments in the absence of urgent reasons was particularly stressful for patients who are at greater risk of developing infections regardless of the infectious agent, including individuals with immunodeficiencies or diabetes or those on immunosuppressive therapy.<sup>3–5</sup>

Several dermatological conditions are treated with systemic immunosuppressive/immunomodulatory drugs such as cyclosporine, methotrexate or biological agents; psoriasis is a typical example.<sup>6</sup> Although the impact of these therapeutic options on increasing the risk of SARS-CoV-2 infection and disease severity remained somewhat uncertain for a long period, national and international guidelines on the topic were gradually updated based on the clinical experience.<sup>7–11</sup> More recently, guidelines on the appointment structure (in-person *versus* virtual), prioritization of clinical admissions (urgent *versus* less urgent), and the frequency of visits have also been developed.<sup>7–12</sup>

In Portugal, the first case of COVID-19 was reported on 2 March 2020, and the first lockdown period started 16 days later, lasting until 3 May 2020. During this period, non-face-to-face appointments gained special importance as a safe way to provide healthcare advice, decreasing the risk of spreading the infection.<sup>12</sup> This policy was reinforced by the patients' own desire to avoid attending healthcare centres. Faced with all these challenges, dermatologists had to reshape their practice, with a constant adaptation to balance the best care and patient safety.

The present study aims first to describe the attitudes and therapeutic options adopted by several Portuguese dermatologists – with different expertise in the management of psoriasis patients on systemic therapies – regarding the management of patients with psoriasis being treated with or with an indication for systemic therapy during the first COVID-19 lockdown period in Portugal. Secondly, it aims to compare the implemented decisions with what is now known on the therapeutic options of psoriasis and their impact on the COVID-19 pandemic.

## Methods

This is a nationwide cross-sectional study involving a web-based survey on the clinical management of systemic therapy for psoriasis during the COVID-19 pandemic. The web-based survey was developed by the Portuguese Group of Psoriasis and made available to all members of the Portuguese Society of Dermatology and Venereology from 5 November to 26 November 2020. The participants had to be dermatologists who had treated patients with psoriasis with systemic therapies. Participation in the study was voluntary. The

survey consisted of 55 questions (4 open-ended questions; 51 closed-ended questions), grouped into 6 sections. The first section included information regarding participants' experience with patients with psoriasis. The second section included information on participants' attitudes during the first COVID-19 lockdown period, whereas the third section included questions on their attitudes after the first COVID-19 lockdown period. The fourth section included information regarding participants' perception on the impact of immunosuppressive/immunomodulator therapy during the COVID-19 pandemic. The fifth section included information regarding face-to-face and non-face-to-face consultations during the COVID-19 pandemic. The last (sixth) section included information regarding participants' awareness of the international and national recommendations made available during the COVID-19 pandemic.

A descriptive analysis is presented. Categorical variables are described using their absolute or relative frequencies, as appropriate. Continuous variables are described as mean  $\pm$  SD.

## Results

A total of 60 Portuguese dermatologists who treated patients with psoriasis agreed to participate in this study. The participants had a mean age of  $49.5 \pm 12.1$  years, with a slight female predominance (56.7%). Almost half of the physicians had been dermatology consultants for over 20 years and 65.0% worked in a public healthcare institution. A total of 59 dermatologists (98.3%) managed patients with psoriasis with biological agents and 62.7% of those had more than 15 patients under this class of drugs. Regarding traditional immunosuppressants 43.3% of the participants had more than 15 patients being treated with cyclosporine or methotrexate. Further details are presented in Table 1.

### First COVID-19 lockdown period

Approximately 63% of the dermatologists opted for the cessation of the biological agents during the COVID-19 lockdown period. Half of these (50%) had suspended treatment in several patients, whereas the other half (50%) suspended treatment only in special cases (not specified). Considering the dermatologists who decided to suspend the drugs, 52.6% made the decision, with the main reasons being (1) disease control (Psoriasis Area Severity Index (PASI) of 0); (2) the concomitant presence of other health risk factors in their patients for the development of more severe COVID-19; or (3) their fear of the possible negative impact of therapy during the pandemic. The remaining participants (47.4%) mentioned that the decision was based on the patient's choice. The decision to increase the time between drug administrations was made by 23.3% of the dermatologists.

The decision of suspending traditional immunosuppressants was taken by 26.7% of the participants. From these, 25.0%

**Table 1. Participant characteristics.**

Characteristics	
Total number of participants, <i>n</i> (%)	60 (100.0)
Women, <i>n</i> (%)	34 (56.7)
Men, <i>n</i> (%)	26 (43.3)
Age, mean $\pm$ SD	49.5 $\pm$ 12.1
Expertise in dermatology, <i>n</i> (%)	
Resident	3 (5.0)
Consultant	57 (95.0)
- For less than 10 years	15 (26.3) <sup>a</sup>
- For 10–20 years	14 (24.6) <sup>a</sup>
- For more than 20 years	28 (49.1) <sup>a</sup>
Workplace <sup>b</sup> , <i>n</i> (%)	
Public healthcare institution	39 (65.0)
Private healthcare institution	39 (65.0)
Solo practice	14 (23.3)
Treating patients with biological agents, <i>n</i> (%)	59 (98.3)
1–5 patients	5 (8.5) <sup>c</sup>
6–15 patients	17 (28.8) <sup>c</sup>
>15 patients	37 (62.7) <sup>c</sup>
Treating patients with traditional immunosuppressants, <i>n</i> (%)	60 (100.0)
1–5 patients	8 (13.4)
6–15 patients	26 (43.3)
>15 patients	26 (43.3)

<sup>a</sup>Proportion compared to the total number of consultants (*n*=57); <sup>b</sup>Participants could select more than one option; <sup>c</sup>Proportion compared to the total number of participants treating patients with biological agents (*n*=59).

made their decision based on the patient's choice, whilst the remaining (75.0%) did so on their own initiative. There was a greater percentage of dermatologists interrupting cyclosporine (81.3%) than methotrexate (62.5%). On the other hand, instead of completely suspending the drug, reducing the dosage of traditional immunosuppressants was a choice for 23.3% of the participants.

Nearly 37% of the participants opted for a switch of treatment. Most of the dermatologists switched to the prescription of a different biological agent (not specified), and none switched to a traditional immunosuppressant. From the group that decided to switch treatment in patients receiving traditional immunosuppressants, the majority switched to a biological agent.

Regarding dermatologists' attitude towards the prescription of a biological agent during the lockdown period, 33.3% admitted that they opted not to prescribe a biological agent due to the pandemic, even in patients with a clinical indication. On the other hand, from those who decided to prescribe biologics, 28.3% did not change their practice during the pandemic and 38.4% opted to restrict the biological agents to highly selected

cases (not specified). The COVID-19 pandemic did not influence the choice of biological agent prescribed for 40.0% of the participants.

When the prescription of traditional immunosuppressants was considered, 40.0% of the dermatologists decided not to do so due to the pandemic. Of those who decided to prescribe these drugs, the lockdown period did not influence the decision for 44.4% and 55.6% opted to restrict immunosuppressant agents to highly selected cases (not mentioned). When there was a choice of drug to prescribe, 44.4% of the dermatologists opted for methotrexate.

Virtual consultations were implemented by 93.3% of the dermatologists (phone or video call). Further details on data from the first COVID-19 lockdown period are provided in Table 2.

## Post-COVID-19 lockdown period

After the first COVID-19 lockdown period in Portugal (19 March to 3 May 2020), 50.0% of the dermatologists decided to retain their restrictions on the treatment options, whereas

**Table 2. Information regarding the first COVID-19 lockdown period.**

<b>Decisions</b>	
Total number of participants, <i>n</i> (%)	60 (100.0)
Decision to suspend biological agents [Yes], <i>n</i> (%)	38 (63.3)
<i>In which cases?</i>	
Several patients	19 (50.0) <sup>a</sup>
Only in special cases (not specified)	19 (50.0) <sup>a</sup>
<i>Who made the suggestion?</i>	
Physician	20 (52.6) <sup>a</sup>
Patient	18 (47.4) <sup>a</sup>
Decision to increase time between biological agent administrations [Yes], <i>n</i> (%)	14 (23.3)
Decision to suspend traditional immunosuppressants [Yes], <i>n</i> (%)	16 (26.7)
<i>Who made the suggestion?</i>	
Physician	12 (75.0)
Patient	4 (25.0)
<i>Which agent(s) was(were) suspended?<sup>b</sup></i>	
Methotrexate	10 (62.5)
Cyclosporine	13 (81.3)
Decision to reduce the dosage of traditional immunosuppressants [Yes], <i>n</i> (%)	14 (23.3)
Decision to switch treatment in patients receiving either biological agents or traditional immunosuppressants [Yes], <i>n</i> (%)	22 (36.6)
Decision to initiate a biological agent in patients with that clinical indication [Yes], <i>n</i> (%)	40 (66.7)
<i>In which cases?</i>	
All the patients with that clinical indication	17 (42.5) <sup>c</sup>
Only in highly selected cases (not specified)	23 (57.5) <sup>c</sup>
<i>Did the COVID-19 pandemic influence your choice of agent? [Yes], <i>n</i> (%)</i>	
	24 (60.0) <sup>c</sup>
Decision to initiate a traditional immunosuppressant in patients with that clinical indication [Yes], <i>n</i> (%)	36 (60.0)
<i>In which cases?</i>	
All the patients with that clinical indication	16 (44.4) <sup>d</sup>
Only in highly selected cases (not specified)	20 (55.6) <sup>d</sup>
<i>Any preferred agent? [Yes], <i>n</i> (%)</i>	
Methotrexate	21 (58.3) <sup>d</sup>
Cyclosporine	16 (76.2) <sup>e</sup>
5 (23.8) <sup>e</sup>	
Decision to implement non-face-to-face consultation [Yes], <i>n</i> (%)	56 (93.3)

<sup>a</sup>Proportion compared to the total number of participants who suspended biological agents (*n*=38); <sup>b</sup>Participants could select more than one option; <sup>c</sup>Proportion compared to the total number of participants who decided to initiate treatment with biological agents (*n*=40); <sup>d</sup>Proportion compared to the total number of participants who decided to initiate treatment with traditional immunosuppressants (*n*=36); <sup>e</sup>Proportion compared to the total number of participants who preferred to initiate a specific traditional immunosuppressants (*n*=21).

the other half returned to their usual practice. However, 11.7% of the participants in the latter group mentioned that they would immediately change their practice in the face of a new infectious peak.

When asked about their attitude towards a new lockdown, 25.0% of the dermatologists answered that they would resume the measures that they had implemented in the first wave, 26.7% answered that they would act as before the emergence

of the COVID-19 pandemic, and 48.3% answered that they would have a restrictive attitude but not as strong as they did during the first wave.

When asked about their attitude on the appointment format, 93.3% of the dermatologists answered that they decreased the number of virtual appointments, gradually resuming face-to-face appointments. Further details on data from the post-COVID-19 lockdown period are provided in Table 3.

**Table 3. Information regarding the post-COVID-19 lockdown period.**

Total number of participants	60 (100.0)
Decision to suspend restrictions regarding treatment implemented during the first lockdown [Yes]	30 (50.0)
Immediately return to the restrictions that were implemented during the first COVID-19 lockdown period in the face of a new infectious peak	7 (11.7)
Which action will you take regarding a new lockdown?	
Resume the measures implemented during the first lockdown	15 (25.0)
Act as before the COVID-19 pandemic	16 (26.7)
Be restrictive but not as heavy as during the first lockdown	29 (48.3)
Decision to gradually return to the face-to-face consultation format [Yes]	56 (93.3)

All the results were made available in *n* (%), with *n* representing the number of cases and the percentage representing the proportion compared to the total number of participants.

## Participants' opinion on the impact of therapeutic options for psoriasis during the COVID-19 pandemic

Portuguese dermatologists were asked about their opinion on the impact of biological agents on the risk of SARS-CoV-2 infection; 80% of the participants answered that, in their opinion, this type of drugs did not change the probability of infection, whereas 10.0% defended that these drugs could increase the risk of SARS-CoV-2 infection and 1.7% answered that these drugs decreased the risk of infection. Regarding the impact of biological agents on the clinical evolution and prognosis of COVID-19, 23.3% answered that these drugs were responsible for an increased risk of severe disease, 16.7% mentioned that biological agents could decrease the disease severity, and 41.7% answered that biological agents did not change the severity of COVID-19. Regarding the preference for a biological agent during the COVID-19 pandemic, 38.3% of the dermatologists answered that they did not have a preferred agent. From those who had a preference, only 1.7% preferred TNF inhibitors, whilst the vast majority selected IL-17 and IL-23 inhibitors.

The opinion of Portuguese dermatologists regarding the impact of traditional immunosuppressants on the risk of infection by SARS-CoV-2 was also addressed; 30.0% answered that they believed these drugs to be responsible for an increased risk of SARS-CoV-2 infection, none thought that these agents could decrease the risk, and 56.7% mentioned that traditional immunosuppressants did not have any impact on the risk of infection. Regarding the impact of these agents on the evolution and prognosis of the disease, 45.0% believed that traditional immunosuppressants were responsible for an increase of severity of COVID-19, 6.6% mentioned that these agents were responsible for a decreased disease severity, and 21.7% referred that these drugs did not change the course of the disease.

When the dermatologists were asked if there was, in their opinion, an association between a specific agent and the increase of COVID-19 severity, from those who answered

positively (46.7%), cyclosporine was the most mentioned drug (53.5%), followed by methotrexate (26.7%) and TNF inhibitors (11.7%).

Most participants (98.3%) mentioned that they were aware of the guidelines and recommendations that emerged during the COVID-19 pandemic. Regarding COVID-19 vaccination, 60.0% of the dermatologists answered that they will suggest the vaccine to all their patients, regardless of ongoing or future treatment. All the participants answered that they would suggest the vaccine to all patients being treated with or with an indication for a biological agent, and 95.0% of the participants would suggest it to those already receiving/set-to-start traditional immunosuppressants. Further details on the participants' opinion on the impact of the therapeutic options for psoriasis during the COVID-19 pandemic are provided in Table 4.

## Discussion

Our study provides data on the experience of a group of dermatology consultants, with different expertise in the management of patients with psoriasis with systemic therapies, when managing and treating these patients during the first COVID-19 lockdown period. During this period, information and guidelines were scarce and most clinical decisions had to be made based on peer-to-peer discussions or on the individual's balance between the best treatment care and the perceived patient safety. A thoughtful review of the decisions made by a heterogeneous group of dermatologists, with different expertise in the treatment of psoriasis patients, will help the adaptation of a faster response in the scenario of a future lockdown period.

Our results demonstrate that several dermatologists decided to suspend biological agents and traditional immunosuppressants, probably related to the described association of these drugs with the increased risk for upper respiratory tract infections, which culminates in an increased risk of worsening psoriasis.<sup>4,13</sup> The proportion of dermatologists that decided to suspend

**Table 4. Data on dermatologists' opinion on the impact of therapeutic options for psoriasis during the COVID-19 pandemic.**

<b>Opinion</b>	
Total number of participants	60 (100.0)
<i>Regarding biological agents and SARS-CoV-2 infection</i>	
<i>Do they increase or decrease the risk of infection?</i>	
Increase	6 (10.0)
Decrease	1 (1.7)
No impact	48 (80.0)
No opinion	5 (8.3)
<i>Do they impact on the evolution/prognosis of the disease caused by the infectious agent?</i>	
Increase the severity	14 (23.3)
Decrease the severity	10 (16.7)
No impact on the severity	25 (41.7)
No opinion	11 (18.3)
<i>Do you have any preferred agent to use during the COVID-19 pandemic?</i>	
No	23 (38.3)
Yes. Which agents?	37 (61.7)
- TNF inhibitors	1 (1.7)
- Dual IL-12/23 inhibitors	11 (18.3)
- IL-17 inhibitors	36 (60.0)
- IL-23 inhibitors	35 (58.3)
<i>Regarding traditional immunosuppressants and SARS-CoV-2 infection</i>	
<i>Do they increase or decrease the risk of infection?</i>	
Increase	18 (30.0)
Decrease	0 (0.0)
No impact	34 (56.7)
No opinion	8 (13.3)
<i>Do they impact on the evolution/prognosis of the disease caused by the infectious agent?</i>	
Increase the severity	27 (45.0)
Decrease the severity	4 (6.6)
No impact on the severity	13 (21.7)
No opinion	16 (26.7)
Is there an association between any specific therapeutic agent and the increase of severity of COVID-19?	
No	2 (3.3)
Do not know/not enough data	30 (50.0)
Yes. Which one?	28 (46.7)
Cyclosporine	15 (53.6)
Methotrexate	7 (25.0)
TNF inhibitors	3 (10.7)
Other agents (not specified)	3 (10.7)
Were you aware of the guidelines and recommendations that emerged during the COVID-19 pandemic?	
No	1 (1.7)
Yes. Which ones? <sup>a</sup>	59 (98.3)

(Continued)

**Table 4. (Continued)**

Opinion	
National guidelines and recommendations	57 (95.0)
International guidelines and recommendations	46 (76.7)
Will you suggest the COVID-19 vaccine to all your patients? <sup>b</sup>	36 (60.0)
Yes	36 (60.0)
No, but at least to those already receiving/set-to-start biological agents	24 (40.0)
No, but at least to those already receiving/set-to-start traditional immunosuppressants	21 (35.0)
No, but at least to those already under/set-to-start phototherapy	2 (3.3)
No, but at least to those already receiving/set-to-start acitretin	2 (3.3)

<sup>a</sup>Participants could select more than one option; <sup>b</sup>Participants could select more than one option if they did not select the answer 'All patients'.

All the results were made available in *n* (%), with *n* representing the number of cases and the percentage representing the proportion compared to the total number of participants.

TNF, tumour necrosis factor.

biological agents in our study is higher than that registered in Italy in the PSO-BIO-COVID study – an observational study that aimed to evaluate the impact of COVID-19 on the management of psoriasis during the pandemic and that was supported by the Italian Society of Dermatology<sup>14</sup> – which might represent a more defensive strategy from Portuguese dermatologists. The current and updated knowledge shows that biological agents do not seem to increase the risk of infection by SARS-CoV-2 compared to the risk for rest of the population.<sup>2,7,11,15</sup> In addition, evidence suggests that patients being treated with biological drugs do not develop a more severe spectrum of the disease or have a worse prognosis.<sup>2,7,11,14,15</sup> Interestingly, COVID-19 seems to induce an immune event known as a 'cytokine storm', an inappropriate host-inflammatory response that seems to be even more exacerbated in patients with more severe disease.<sup>10,15</sup> Therefore, several targeted therapies – some of them also used in psoriasis, such as ixekizumab or adalimumab – have been introduced in clinical trials to evaluate their effectiveness in treating patients with SARS-CoV-2 infection.<sup>15</sup>

Despite the greater concern of Portuguese dermatologists regarding TNF inhibitors, current data also seem to indicate that patients recently exposed to these biological agents do not have a higher risk of hospitalization or mortality associated with COVID-19 when compared to the rest of the population.<sup>16</sup> Traditional immunosuppressants were also a point for disagreement among Portuguese dermatologists. However, recent data seem to indicate that exposure to methotrexate or cyclosporine do not increase the risk of hospitalization or mortality compared with patients infected with SARS-CoV-2 without recent exposure to these drugs.<sup>16–18</sup>

Several participants decided not to prescribe the appropriate therapy in certain situations due to the COVID-19 pandemic. Undertreatment, a problem that has been identified in the past, discussed for several years and intensified during the

COVID-19 pandemic, might induce the worsening of psoriasis and condition the future response to the various therapeutic options to be proposed.<sup>19</sup> An inadequate treatment results in an incalculable impact on the patients' quality of life.<sup>19</sup> A group of Portuguese dermatologists claim that they would have an equally restrictive attitude in future lockdowns. It is important to reinforce that, from what we know today about the impact of the different therapeutic options on SARS-CoV-2 infection, this attitude does not seem appropriate and might have negative effects in their patients' quality of life.

The increase in the number of virtual appointments was a solution adopted by clinicians and healthcare administrations to ensure the proper and possible support for their patients when there was a lack of information about SARS-CoV-2. This strategy sought to decrease the risk for the patients but also the risk for disseminating the infection at healthcare centres.<sup>12</sup> However, objective examination and medical evaluation are irreplaceable in dermatology and the long-term implementation of virtual appointments is unsustainable. We now know that the risk of being infected by COVID-19 is markedly reduced by ensuring proper hygiene measures, social distancing and the use of facemasks.<sup>20–22</sup> Additionally, the awareness of the entire population for COVID-19-associated signs and symptoms and the prevention strategies that have been implemented in healthcare facilities will ultimately contribute to a gradual resumption of phototherapy and face-to-face visits. Lastly, the recent approval of vaccines that demonstrated a high safety and efficacy profile was an essential milestone in this long path to resume our society to the pre-COVID-19 era.<sup>23</sup>

## Conclusion

Our study summarizes the strategies and clinical decisions of several Portuguese dermatology consultants – with different

expertise in the management of patients with psoriasis with systemic therapies – on how to manage patients with psoriasis on systemic treatments during the first COVID-19 lockdown in Portugal. Some of the decisions made during that period

were contrary to what is known today about the therapeutic options in psoriasis and the COVID-19 pandemic. Our analysis highlights and discusses important healthcare practice adaptations that will be essential for future lockdown periods.

**Contributions:** All authors contributed equally to the preparation of this review. All named authors meet the International Committee of Medical Journal Editors (ICMJE) criteria for authorship for this article, take responsibility for the integrity of the work as a whole and have given their approval for this version to be published.

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