

LETTERS TO THE EDITOR

Impact of Sars-CoV-2 pandemic on psoriatic patients

To the Editor,

Psoriasis is a chronic inflammatory cutaneous disease that can be triggered or exacerbated by several factors such as stress, infections, and medications. During the Sars-CoV-2 pandemic, several case reports of worsening of psoriasis due to Sars-CoV-2 disease (COVID-19) or Sars-CoV-2 vaccinations have been reported.¹⁻⁴ The aim of our report is to evaluate the patients perception on the impact of Sars-CoV-2 pandemic on their cutaneous condition. We administered two surveys to psoriatic patients in the period between March 2021 and June 2021 to evaluate the impact of lockdown and Sars-CoV-2 on their cutaneous condition or treatments and to understand the perception on Sars-CoV-2 vaccination and if it could interfere with psoriasis and its treatments. Overall, 119 patients accepted to answer the survey. Psoriasis treatments were small molecules/biologic (49%), methotrexate (7%), other systemic (11%), topicals (23%), UVB (4%), and none (6%). Cardiovascular disease and psoriatic arthritis were present in 25.2% of patients followed by obesity (23.6%), autoimmune disease, neoplasm, diabetes, and anxiety. COVID-19 affected 11.7% of patients. Follow-up was not attended by 30% of patients during lockdown, in the other cases consultations were done face-to-face (50.0%), by telemedicine (6%), or there was no follow-up scheduled in that period (14%). Treatment was interrupted by 13.5% of patients and a worsening during the lockdown was referred by 34.5% of patients. Patients were not concerned about the possibility of psoriasis worsening due to Sars-CoV-2 infection in 91% of cases and were not feared that psoriasis or their psoriasis treatment could favor a COVID-19, respectively, in 88.2% and 87.4% of cases. Sixty eight percent of patients were vaccinated, among them 7.6% referred a psoriasis flare up after Sars-CoV-2 vaccination. Patients were not afraid of being vaccinated in 73.1% of cases and only 16% of patients was concerned that Sars-CoV-2 vaccine could interfere with their psoriasis and/or psoriasis treatment. Overall, 31% of patients considered themselves as "fragile patients" who needed to receive Sars-CoV-2 vaccine with a priority for their skin condition (10%), for psoriasis treatment (7.6%), for both (1.7%) and for their comorbidities (11.8%). A multivariate

logistic regression analysis was performed to evaluate any difference between who contracted COVID-19 and who did not, and who was vaccinated and who did not (Tables 1 and 2). Qualitative variables were described with absolute and relative (percentage) frequencies, whereas the only quantitative variable (age) was described with median and interquartile range, based on its non-normal distribution. Groups were compared with chi-squared or Fisher exact test when appropriate. Age was compared with Mann-Whitney test. A two-tailed p -value less than 0.05 was considered statistically significant. Stata software version 17 (StatsCorp, Texas, USA) was used for all statistical computations. Patients who had COVID-19 referred a psoriasis worsening during lockdown more frequently than patients who did not have COVID-19 (p -value 0.005), they also did not attend follow-up (p -value 0.005), stopped psoriasis treatment (p -value 0.005) and had feared that Sars-Cov-2 vaccine could interfere with psoriasis treatment (p -value 0.002) more frequently than the other group. Patients who did not receive vaccination had feared that COVID-19 could trigger a severe form of psoriasis (p -value 0.03), Sars-Cov-2 vaccine could worsen psoriasis or interfere with treatment (p -value 0.04) that psoriasis could favor vaccine adverse reaction (p -value 0.04), and that psoriasis treatment could favor vaccine adverse reaction and/or reduce vaccine effectiveness (p -value 0.009). Our results show that patients who had COVID-19 reported a psoriasis worsening, difficulties, and fear in attending appointments and continuing treatments more often than the other group. Moreover, although great effort has been done to sensitize population and psoriatic patients about the importance of Sars-CoV-2 vaccination several doubts and fears emerged through these surveys. In addition, most patients did not consider themselves as "fragile patients" underestimating the impact that their disease and immune modulating treatment could have on Sars-CoV-2 infection.⁵ In these years, patients point of view have become the focus of psoriatic patients, and in our opinion reporting patient's perception of the several aspects of pandemic is of great value. A limit of the study is that it was performed in a single center involving a relatively low number of patients.

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TABLE 1 Comparison of survey's answers between who contracted COVID-19 and who did not

Survey questions	COVID-19		p-value
	Yes (n = 15)	No (n = 104)	
Median (IQR) age, Years	50 (41-59)	60 (49-68)	0.02
Males, n (%)	10 (66.7)	59 (56.7)	0.47
Psoriasis type, n (%)			
Psoriasis in plaque	12 (80.0)	97 (93.3)	0.11
Pustular Psoriasis	3 (20.0)	6 (5.8)	0.09
Erythrodermic psoriasis	0 (0.0)	1 (1.0)	1.00
Treatment during lockdown (March 2020-1° Follow-up), n (%)			
Topical	4 (26.7)	24 (23.1)	0.75
Methotrexate	1 (6.7)	8 (7.7)	1.00
Other systemic	0 (0.0)	13 (12.5)	0.37
UVB	0 (0.0)	5 (4.8)	1.00
Biologic-small molecules	9 (60.0)	51 (49.0)	0.43
None	1 (6.7)	7 (6.7)	1.00
Treatment during vaccination campaign (February 2021—to date), n (%)			
Topical	2 (13.3)	26 (25.0)	0.52
Methotrexate	2 (13.3)	12 (11.5)	0.69
Other systemic	1 (6.7)	15 (14.4)	0.69
UVB	0 (0.0)	1 (1.0)	1.00
Biologic-small molecules	9 (60.0)	51 (49.0)	0.43
None	1 (6.7)	1 (1.0)	0.24
Comorbidities, n (%)			
Obesity	5 (33.3)	23 (22.1)	0.34
Diabetes	1 (6.7)	11 (10.6)	1.00
Inflammatory Bowel Disease	0 (0.0)	2 (1.9)	1.00
Psoriatic Arthritis	5 (33.3)	25 (24.0)	0.44
Cardiovascular Diseases	4 (26.7)	26 (25.0)	1.00
Autoimmune Diseases	0 (0.0)	14 (13.5)	0.21
Kidney Diseases	0 (0.0)	2 (1.9)	1.00
Liver Diseases	1 (6.7)	6 (5.8)	1.00
Anxiety	0 (0.0)	12 (11.5)	0.36
Cancer	0 (0.0)	13 (12.5)	0.37
None	5 (33.3)	34 (32.7)	1.00
Smoke, n (%)			
Yes	4 (26.7)	35 (33.7)	0.59
No	4 (26.7)	34 (32.7)	0.77
Former	6 (40.0)	35 (33.7)	0.77
Covid-19 Survey			
Did you have COVID-19? n (%)			
No	-	-	-
Asymptomatic	3 (20.0)	-	-
Mild	10 (66.7)	-	-
Severe	1 (6.7)	-	-
Did you attend follow-up during Lockdown? n (%)			
Yes, face to face	4 (26.7)	65 (62.5)	0.01

TABLE 1 (Continued)

Survey questions	COVID-19		p-value
	Yes (n = 15)	No (n = 104)	
Yes, telemedicine	3 (20.0)	6 (5.8)	0.09
No, I did not manage to get in contact with the hospital	1 (6.7)	11 (10.6)	1.00
No, for logistical problems	4 (26.7)	3 (2.9)	0.005
No, because I was afraid to go to the hospital	0 (0.0)	3 (2.9)	1.00
No, because I had no follow-up scheduled in that period	3 (20.0)	16 (15.4)	0.71
Did you stop your treatment during the lockdown? n (%)			
No, it was prescribed by the dermatologist face to face	3 (20.0)	62 (59.6)	0.005
No, I wasn't doing any treatment	1 (6.7)	10 (9.6)	1.00
No, it was automatically provided by the pharmacy	2 (13.3)	14 (13.5)	1.00
No, I received the prescription by telemedicine	4 (26.7)	7 (6.7)	0.03
Yes, for difficulties to contact the hospital	1 (6.7)	6 (5.8)	1.00
Yes, I was afraid that the treatment could interfere with COVID-19	-	-	-
Yes, for logistical problems	2 (13.3)	2 (1.9)	0.08
Yes, I was afraid to go to the hospital and/or to the pharmacy	0 (0.0)	3 (2.9)	1.00
Yes, because I had COVID-19	2 (13.3)	0 (0.0)	0.02
Did your psoriasis got worse during Lockdown? n (%)			
Yes	10 (66.7)	31 (29.8)	0.005
No	6 (33.3)	73 (70.2)	0.005
Were you afraid that Sars-CoV-2 could interfere with psoriasis? n (%)			
No	8 (53.3)	83 (79.8)	0.045
Yes, that I could not attend follow-up due to COVID-19 and pandemic restrictions.	1 (6.7)	6 (5.8)	1.00
Yes, that I had to stop treatments for psoriasis	4 (26.7)	8 (7.7)	0.045
Yes, that COVID-19 could trigger a severe form of psoriasis	3 (20.0)	6 (5.8)	0.09
Yes, for all the reasons above	0 (0.0)	4 (3.9)	1.00
Were you afraid that psoriasis could increase the probabilities to contract COVID-19 or to have a more severe form of COVID-19? n (%)			
No	13 (86.7)	92 (88.5)	0.69
Yes, to increase the probabilities	0 (0.0)	7 (6.7)	0.59
Yes, to contract a more severe form	1 (6.7)	1 (1.0)	0.24
Yes, both	1 (6.7)	4 (3.9)	0.50
Were you afraid that your psoriasis treatment could increase the probabilities to contract COVID-19 or to have a more severe form of COVID-19? n (%)			
No	10 (66.7)	94 (90.4)	0.01
Yes, to increase the probabilities	3 (21.4)	5 (4.8)	0.05
Yes, to contract a more severe form	1 (6.7)	2 (1.9)	0.34
Yes, both	1 (6.7)	3 (2.9)	0.42
Vaccine survey			
Did you get Sars-CoV-2 Vaccination? n (%)			
No	8 (53.3)	30 (28.9)	0.06
Yes, first dose with AstraZeneca	0 (0.0)	17 (16.4)	0.12
Yes, second dose with AstraZeneca	2 (13.3)	5 (4.8)	0.21
Yes, first dose with Pfizer	0 (0.0)	18 (17.3)	0.12
Yes, second dose with Pfizer	5 (33.3)	25 (24.0)	0.53
Yes, first dose with Moderna	0 (0.0)	1 (1.0)	1.00
Yes, second dose with Moderna	0 (0.0)	8 (7.7)	0.59

(Continues)

TABLE 1 (Continued)

Survey questions	COVID-19		p-value
	Yes (n = 15)	No (n = 104)	
Did you have a psoriasis flare up after the vaccination?			
Yes	0 (0.0)	9 (8.7)	0.30
No	7 (46.7)	65 (62.5)	0.24
Not done	8 (53.3)	30 (29.9)	0.06
Were you afraid to be vaccinated? n (%)			
No	9 (60.0)	78 (75.0)	0.22
Yes	6 (40.0)	26 (25.0)	0.22
Are you afraid that vaccine can interfere with psoriasis or your psoriasis treatment? n (%)			
No	10 (66.7)	90 (86.5)	0.05
Yes, with psoriasis	0 (0.0)	5 (4.8)	1.00
Yes, with psoriasis treatment	4 (26.7)	6 (5.8)	0.002
Yes, both	1 (6.7)	4 (3.9)	0.50
Are you afraid that psoriasis can interfere with the vaccine? n (%)			
No	12 (80.0)	94 (90.4)	0.23
Yes, that psoriasis can favor vaccine adverse reaction.	2 (13.3)	3 (2.9)	0.12
Yes, that psoriasis can reduce vaccine effectiveness	1 (6.7)	3 (2.9)	0.45
Yes, both	0 (0.0)	3 (2.9)	1.00
Are you afraid that psoriasis treatment can interfere with the vaccine? n (%)			
No	12 (80.0)	89 (85.6)	0.70
Yes, that treatment can favor vaccine adverse reaction.	3 (20.0)	7 (6.7)	0.11
Yes, that treatment can reduce vaccine effectiveness	0 (0.0)	4 (3.9)	1.00
Yes, both	0 (0.0)	4 (3.9)	1.00
Do you consider yourself a "fragile patient" who should have a priority for vaccination? n (%)			
No	14 (93.3)	68 (65.4)	0.04
Yes, for psoriasis	0 (0.09)	12 (11.5)	0.36
Yes, for psoriasis treatment	1 (6.7)	8 (7.7)	1.00
Yes, for both	0 (0.0)	2 (1.9)	1.00
Yes, for comorbidities	0 (0.0)	14 (13.5)	0.21

TABLE 2 Comparison of survey's answers between who was vaccinated for Sars-CoV-2 and who was not

	SARS-CoV-2 vaccination		p-Value
	Yes (n = 81)	No (n = 38)	
Median (IQR) age, Years	62 (52-69)	52.5 (42-59)	0.0001
Males, n (%)	45 (55.6)	24 (63.2)	0.43
Psoriasis type, n (%)			
Psoriasis in plaque	76 (93.8)	33 (86.89)	0.20
Pustular Psoriasis	4 (4.9)	5 (13.2)	0.14
Erythrodermic psoriasis	1 (1.2)	0 (0.0)	1.00
Treatment during lockdown (March 2020-1° Follow-up), n (%)			
Topical	21 (25.9)	7 (18.4)	0.49
Methotrexate	7 (8.6)	2 (5.3)	0.72
Other systemic	9 (11.1)	4 (10.5)	1.00

TABLE 2 (Continued)

	SARS-CoV-2 vaccination		
	Yes (n = 81)	No (n = 38)	p-Value
UVB	3 (3.7)	2 (5.3)	0.65
Biologic-small molecules	40 (49.4)	20 (52.6)	0.74
None	4 (4.9)	4 (10.5)	0.27
Treatment during vaccination campaign (February 2021—to date), n (%)			
Topical	24 (29.6)	4 (10.5)	0.02
Methotrexate	8 (9.9)	6 (15.8)	0.35
Other systemic	12 (14.8)	4 (10.5)	0.77
UVB	1 (1.2)	0 (0.0)	1.00
Biologic-small molecules	37 (45.7)	23 (60.5)	0.13
None	0 (0.0)	2 (5.3)	0.10
Comorbidities, n (%)			
Obesity	18 (22.2)	10 (26.3)	0.62
Diabetes	9 (11.1)	3 (7.9)	0.75
Inflammatory Bowel Disease	1 (1.2)	1 (2.6)	0.54
Psoriatic Arthritis	22 (27.2)	8 (21.1)	0.47
Cardiovascular Diseases	24 (29.6)	6 (15.8)	0.11
Autoimmune Diseases	11 (13.6)	3 (7.9)	0.54
Kidney Diseases	2 (2.5)	0 (0.0)	1.00
Liver Diseases	5 (6.2)	2 (5.3)	1.00
Anxiety	7 (8.6)	5 (13.2)	0.45
Cancer	11 (13.6)	2 (5.3)	0.22
None	23 (28.4)	16 (42.1)	0.14
Smoke, n (%)			
Yes	25 (30.9)	14 (36.8)	0.52
No	24 (29.69)	14 (36.8)	0.43
Former	31 (38.3)	10 (26.3)	0.20
Covid-19 Survey			
Did you have COVID-19? n (%)			
No	74 (91.4)	30 (79.0)	0.06
Asymptomatic	1 (1.2)	2 (5.3)	0.24
Mild	5 (6.2)	5 (13.2)	0.20
Severe	0 (0.0)	1 (2.6)	0.32
Did you attend follow-up during Lockdown? n (%)			
Yes, face to face	43 (53.1)	26 (68.4)	0.16
Yes, telemedicine	7 (8.6)	2 (5.3)	0.72
No, I did not manage to get in contact with the hospital	10 (12.4)	2 (5.3)	0.33
No, for logistical problems	6 (7.4)	1 (2.6)	0.43
No, because I was afraid to go to the hospital	1 (1.2)	2 (5.3)	0.24
No, because I had no follow-up scheduled in that period	14 (17.3)	5 (13.2)	0.57
Did you stop your treatment during the lockdown? n (%)			
No, it was prescribed by the dermatologist face to face	42 (51.9)	23 (60.5)	0.38
No, I wasn't doing any treatment	7 (8.6)	4 (10.5)	0.74
No, it was automatically provided by the pharmacy	13 (16.1)	3 (7.9)	0.27
No, I received the prescription by telemedicine	9 (11.1)	2 (5.3)	0.50

(Continues)

TABLE 2 (Continued)

	SARS-CoV-2 vaccination		
	Yes (n = 81)	No (n = 38)	p-Value
Yes, for difficulties to contact the hospital	5 (6.2)	2 (5.3)	1.00
Yes, I was afraid that the treatment could interfere with COVID-19	-	-	
Yes, for logistical problems	2 (2.5)	2 (5.3)	0.59
Yes, I was afraid to go to the hospital and/or to the pharmacy	1 (1.2)	2 (5.3)	0.24
Yes, because I had COVID-19	2 (2.5)	0 (0.0)	1.00
Did your psoriasis got worse during Lockdown? n (%)			
Yes	24 (59.6)	17 (44.7)	0.11
No	57 (70.4)	21 (55.3)	0.11
Were you afraid that Sars-CoV-2 could interfere with psoriasis? n (%)			
No	65 (80.3)	26 (68.4)	0.16
Yes, that I could not attend follow-up due to COVID-19 and pandemic restrictions.	4 (4.9)	3 (7.9)	0.68
Yes, that I had to stop treatments for psoriasis	8 (9.9)	4 (10.5)	1.00
Yes, that COVID-19 could trigger a severe form of psoriasis	3 (3.7)	6 (15.8)	0.03
Yes, for all the reasons above	2 (2.5)	2 (5.3)	0.59
Were you afraid that psoriasis could increase the probabilities to contract COVID-19 or to have a more severe form of COVID-19? n (%)			
No	72 (88.9)	33 (86.8)	0.75
Yes, to increase the probabilities	4 (4.9)	3 (7.9)	0.68
Yes, to contract a more severe form	1 (1.2)	1 (2.6)	0.54
Yes, both	4 (4.9)	1 (2.6)	1.00
Were you afraid that your psoriasis treatment could increase the probabilities to contract COVID-19 or to have a more severe form of COVID-19? n (%)			
No	73 (90.1)	31 (81.6)	0.24
Yes, to increase the probabilities	5 (6.3)	3 (7.9)	0.71
Yes, to contract a more severe form	2 (2.5)	1 (2.6)	1.00
Yes, both	1 (1.2)	3 (7.9)	0.10
Vaccine survey			
Did you get Sars-CoV-2 Vaccination? n (%)			
No	-	-	-
Yes, first dose with AstraZeneca	17 (21.0)	-	-
Yes, second dose with AstraZeneca	7 (8.6)	-	-
Yes, first dose with Pfizer	18 (22.2)	-	-
Yes, second dose with Pfizer	30 (37.0)	-	-
Yes, first dose with Moderna	1 (1.2)	-	-
Yes, second dose with Moderna	8 (9.9)	-	-
Did you have a psoriasis flare up after the vaccination?			
Yes	9 (11.1)	-	-
No	72 (88.9)	-	-
Not done	-	-	-
Were you afraid to be vaccinated? n (%)			
No	60 (74.1)	27 (71.1)	0.73
Yes	21 (25.9)	11 (29.0)	0.73
Are you afraid that vaccine can interfere with psoriasis or your psoriasis treatment? n (%)			
No	74 (91.4)	26 (68.4)	0.001
Yes, with psoriasis	2 (2.5)	3 (7.9)	0.17

TABLE 2 (Continued)

	SARS-CoV-2 vaccination		p-Value
	Yes (n = 81)	No (n = 38)	
Yes, with psoriasis treatment	5 (6.2)	5 (13.2)	0.20
Yes, both	1 (1.2)	4 (10.5)	0.04
Are you afraid that psoriasis can interfere with the vaccine? n (%)			
No	78 (96.3)	28 (73.7)	0.001
Yes, that psoriasis can favor vaccine adverse reaction.	1 (1.2)	4 (10.5)	0.04
Yes, that psoriasis can reduce vaccine effectiveness	2 (2.5)	1 (5.3)	0.59
Yes, both	0 (0.0)	3 (7.9)	0.03
Are you afraid that psoriasis treatment can interfere with the vaccine? n (%)			
No	73 (90.1)	28 (73.7)	0.02
Yes, that treatment can favor vaccine adverse reaction.	6 (7.4)	4 (10.5)	0.72
Yes, that treatment can reduce vaccine effectiveness	2 (2.5)	2 (5.3)	0.59
Yes, both	0 (0.0)	4 (10.5)	0.009
Do you consider yourself a "fragile patient" who should have a priority for vaccination? n (%)			
No	55 (67.9)	27 (71.1)	0.73
Yes, for psoriasis	9 (11.1)	3 (7.9)	0.75
Yes, for psoriasis treatment	7 (8.6)	2 (5.3)	0.72
Yes, for both	1 (1.2)	1 (2.6)	0.54
Yes, for comorbidities	9 (11.1)	5 (13.2)	0.75

AUTHOR CONTRIBUTIONS

GB, GC, FS, and MAM administered the surveys. GB and FS collected the data. GS analyzed the data. GB and MAM wrote the paper. MAM and RS reviewed the paper. All authors (GB, GS, GC, FS, RS, and MAM) read and approved the final manuscript.

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CONFLICT OF INTEREST

No conflict of interests.

DATA AVAILABILITY STATEMENT

The data that supports the findings of this study are available in the supplementary material of this article.

ETHICAL APPROVAL

Authors declare human ethics approval was not needed for this study.

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