Received: 2 December 2020 | Revised: 14 December 2020 | Accepted: 16 December 2020

DOI: 10.1111/dth.14691

ORIGINAL ARTICLE

DERMATOLOGIC THERAPY WILEY

The impact of COVID-19 in patients with psoriasis: A multicenter study in Istanbul

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Abstract

There is widespread concern about treatment of psoriasis in COVID-19 pandemic. We aimed to evaluate the epidemiological data, clinical characteristics, treatment features of the psoriasis patients during the pandemic period. We conducted a study in dermatology clinics of seven different tertiary centers. All adult psoriasis patients who were followed up between 11 March 2020 and 28 June 2020, were phone called or questioned in their visit to their follow-up clinics. A semistructured questionnaire was applied and patients' demographics and disease characteristics were recorded. Of 1322 patients, 52.4% were male, and 47.6% were female. According to the questionnaire responses, 964 (72.9%) of these patients could not communicate with their physician during this period, remained 358 (27.1%) patients contacted the physician by phone, email, or hospital visit. From the patients diagnosed as probable/confirmed COVID-19, 14 were female, and 9 were male. Nine of 23 (39.1%) patients were using biologic treatment. There was no statistically significant difference in terms of hospitalization from COVID-19 between the patients using biologics (n = 9) and those who did not (n = 14) (P = 1.00). No mortality was observed among them. Obesity, smoking, age, and accompanying psoriatic arthritis were not among the risk factors affecting the frequency of COVID-19. We only encountered an increased risk in diabetic patients. Also, an exacerbation of psoriasis was observed with the infection. No difference was found in patients with psoriasis in terms of COVID-19 infection in patients who use biologics and those who don't.

KEYWORDS
biological therapy, COVID-19, immunosuppression, pandemia, psoriasis, SARS-CoV-2

1 | INTRODUCTION

According to the World Health Organization (WHO), a new type of coronavirus called severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), causing viral pneumonia, was identified in Wuhan, China, in December 2019.[1] With Coronavirus disease 2019 (COVID-19) infection, the WHO pronounced on 11 March 2020 that this global epidemic was a pandemic; this was also the date upon which the first case of COVID-19 infection in Turkey was reported by the Ministry of Health.[2,3] According to the WHO's definition of COVID-19, all PCR-positive patients were accepted as confirmed COVID-19. Patients who met clinical criteria and had contact with probable or confirmed cases; and/or a suspect case with chest imaging showing findings suggestive of COVID-19 disease (multiple bilateral ground

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glass opacities, often rounded in morphology, with peripheral and lower lung distribution in chest computerized tomography) were considered as probable COVID-19.[4] Older age, cardiovascular disease, diabetes, chronic respiratory disease, hypertension and cancer were defined as risk factors for increased risk of death.[5]

Psoriasis is a chronic inflammatory disease with a worldwide frequency of approximately 2% to 3%. Elderly psoriasis patients and/or patients using conventional immunosuppressive regimens and biologic agents are at higher risk for infectious diseases. But despite some reports about psoriasis and COVID-19, there is uncertainty concerning outcomes of infection in patients with psoriasis or those treated with immunosuppressive therapies.[6,7]

The course of COVID-19 also varies between countries, so it is important for countries to create their own data for this barely understood disease. The main aim of the study was to evaluate epidemiological data for patients with psoriasis during the pandemic period in Istanbul. The secondary aim was to evaluate clinical characteristics of psoriasis patients with COVID-19 and compare rates for patients who received or did not receive immunosuppressive or biological therapies.

2 | MATERIALS AND METHODS

We conducted a study in dermatology clinics of seven different tertiary centers. All adult psoriasis patients followed up between 11 March 2020 and 28 June 2020 were phoned or questioned in visits to follow-up clinics. A semistructured questionnaire was developed and administered to patients giving verbal consent. Demographics and disease characteristics were recorded from patients' medical files.

Patients' demographic features (age, gender, body mass index [BMI], smoking, alcohol use) and disease characteristics (type of psoriasis, duration of disease, comorbidities, psoriasis treatments) were recorded.

During the COVID-19 period, patients answered questions about whether they communicated with their doctors, how they continued treatment and whether they were diagnosed with COVID-19. The data (diagnosis methods, symptoms, hospitalization duration, treatment for COVID-19, prognosis) of patients who said they were diagnosed with COVID-19 was recorded from their medical records. If patients were working during this period, they were also asked about compliance with isolation rules and whether someone in contact with them had been diagnosed with COVID-19.

In our study, the diagnosis of COVID-19 was determined as probable/confirmed COVID-19 as defined by WHO.[4] We compared our data with the data of the Ministry of Health.

2.1 | Statistics

In the descriptive statistics, the mean, SD, median lowest and highest, frequency and ratio values were used. The distribution of variables was measured with the Kolmogorov Smirnov test. Mann-Whitney's test was used to analyze the independent quantitative data. The chi-square test was used to analyze the independent qualitative data, and a Fischer test was used when chi-square test conditions were not met. The SPSS 26.0 program was used in the analyses.

3 | RESULTS

Our study enrolled 1322 patients from seven different centers; 52% (n = 693) were male and 47.6% female. The mean age was 47.0 ± 14.4 years. In our study, the age, gender, weight, height, BMI value, BMI distribution, smoking rate, smoking duration, alcohol use rate and working rate in this period were not significantly different among COVID-19 (–) and (+) groups ($P > .05$). In the COVID-19 (+) group, the DM rate was significantly higher than in the COVID-19 (–) group ($P = .024$). Rates of obesity, HT, lung disease, renal disease, liver disease, cancer and psychiatric disease did not show a statistically significant difference in the COVID-19 (–) and (+) groups ($P > .05$). Patient characteristics are included in Table 1. Almost 30% of patients (n = 369) were using topical treatment, 23.3% a conventional treatment (cyclosporin A, methotrexate [MTX]), 16.5% acitretin and 2.4% phototherapy. Of 1322 (29.3%) psoriasis patients, 388 were receiving only biological therapy, and 10 (0.8%) patients were receiving a combination of biological and immunosuppressive therapy. All patients' treatment agents and also comparisons of medicines in the COVID-19 (+) and (–) groups are given in Table 2.

According to the questionnaire responses, while 964 (72.9%) of these patients could not communicate with their physician during this period, 358 (27.1%) met their physicians by phone, email, or hospital visits. While treatment was continued in 240 of 358 (67.0%) patients who reached their physicians during the study time period, 118 (33.0%) discontinued treatment. Forty-five of these patients had switched to a different treatment from a previous agent (12.6%) (topical, acitretin, other biologics). We found that 230 of 964 (23.9%) of patients who could not reach their physicians applied to a pharmacy to continue treatment, and 252 of 964 (26.1%) chose to stop psoriasis treatment completely without contacting their physicians. While 372 of 964 patients (38.6%) who did not reach their doctors continued their current medication, 110 (11.4%) used whatever medication they had at home. There was no statistically significant difference between the COVID-19 (–) and (+) groups ($P > .05$ for all) in rates of communication with physicians, continuing treatment or drug withdrawal.

In our study, 388 of 1322 (29.3%) psoriasis patients were receiving only biological therapy, and 10 (0.8%) were receiving biological and immunosuppressive therapy together. The rate of distribution of biological treatment in COVID-19 (–) and (+) groups showed no statistically significant difference ($P > .05$).

Twenty-seven (2.1%) psoriasis patients contacted by phone or interviewed at a hospital follow-up clinic stated that they had been diagnosed with COVID-19. PCR results for 18 of them were positive. Five patients showed a negative PCR test, but evidence supporting

TABLE 1 Demographic and clinical characteristics of psoriasis patients (Comparison of COVID-19 (+) and (–) patients)

			COVID-19 (–)			COVID-19 (+)			
		All (n = 1322)	Mean ± SD or n (%)			Mean ± SD or n (%)			
Age			47.0	±	14.5	46.4	±	13.4	.837 [m]
Gender	Female	629 (47.6)	615		47.3%	14		60.9%	.198 x^2
	Male	693 (52.4)	684		52.7%	9		39.1%	
Weight (kg)		79.7 ± 14.7	79.7	±	14.7	79.6	±	13.9	.964 [m]
Height (cm)		168.0 ± 9.1	168.0	±	9.1	165.6	±	11.4	.375 [m]
BMI (kg/cm^2)		28.3 ± 5.3	28.3	±	5.3	29.1	±	4.7	.228 [m]
BMI	<18.5	21 (1.6)	21		1.6%	0		0.0%	.439 x^2
	18.5-24.9	328 (24.8)	324		24.9%	4		17.4%	
	25-29.9	553 (41.8)	545		42.0%	8		34.8%	
	30 ≥	420 (31.8)	409		31.5%	11		4.8%	
Smoking	Nonsmoker	645 (48.8)	628		48.3%	17		73.9%	.052 x^2
	Active smoker	471 (35.6)	467		36.0%	4		17.4%	
	Former smoker	206 (15.6)	204		15.7%	2		8.7%	
Pack/years		19.1 ± 14.5	19.1	±	14.5	13.8	±	13.4	.266 [m]
Alcohol use	None	1098 (83.1)	1076		82.8%	22		95.7%	.178 x^2
	Chronic alcohol use	26 (2.0)	26		2.0%	0		0.0%	
	Social drink	164 (12.4)	163		12.5%	1		4.3%	
	Previous use	34 (2.6)	34		2.6%	0		0.0%	
Occupation	Unemployed	46 (3.5)	45		3.5%	1		4.3%	
	Housewife	407 (30.8)	396		30.5%	11		47.8%	
	Retired	252 (19.1)	251		19.3%	1		4.3%	
	Employee	133 (10.1)	128		9.9%	5		21.7%	
	Government official	50 (3.8)	49		3.8%	1		4.3%	
	Own business	72 (5.4)	71		5.5%	1		4.3%	
	Private sector employee	282 (21.3)	282		21.7%	0		0.0%	
	Student	50 (3.8)	50		3.8%	0		0.0%	
	Health employee	17 (1.3)	14		1.1%	3		13.0%	
	Others	13 (1.0)	13		1.0%	0		0.0%	
Working status	Not work	251 (44.1)	249		19.2%	2		8.7%	.416 x^2
	Full-time Part-time	133 (23.4) 185 (32.5)	128		9.9%	5		21.7%	
	All	COVID-19 (–)			COVID-19 (+)			*P*	
	(n = 1322)	n	%		n	%			
Obesity	(–) 902 (68.2)	890	68.5		12	52.2		.093	x^2
	(+) 418 (31.6)	407	31.3		11	47.8			
Diabetes mellitus	(–) 1135 (85.9)	1119	86.1		16	69.6		.024	x^2
	(+) 187 (14.1)	180	13.9		7	30.4			
Hypertension	(–) 1056 (79.9)	1037	79.8		19	82.6		.742	x^2
	(+) 266 (20.1)	262	20.2		4	17.4			
Pulmonary disease	(–) 1260 (95.3)	1237	95.2		23	100.0		.564	x^2
	IPF 35 (2.6)	35	2.7		0	0.0			
	COPD 17 (1.3)	17	1.3		0	0.0			
	Others 10 (0.3)	10	0.8		0	0.0			
Renal disease	(–) 1296 (98.0)	1273	98.0		23	100.0		1.000	x^2
	(+) 26 (2.0)	26	2.0		0	0.0			

(Continues)

TABLE 1 (Continued)

		All (n = 1322)	COVID-19 (–) Mean ± SD or n (%)		COVID-19 (+) Mean ± SD or n (%)		
Liver disease	(–) 1282 (97.0)	1261	97.1	21	91.3	.146	x^2
	(+) 39 (3.0)	37	2.8	2	8.7		
Coronary heart disease	(–) 1242 (93.9)	1221	94.0	21	91.3	.646	x^2
	(+) 80 (6.1)	78	6.0	2	8.7		
Malignancies	(–) 1286 (97.3)	1264	97.3	22	95.7	.473	x^2
	(+) 36 (2.7)	35	2.7	1	4.3		
Psychiatric diseases (Depression)	(–) 1239 (93.7)	1217	93.7	22	95.7	1.000	x^2
	(+) 83 (6.3)	82	6.3	1	4.3		
Psoriatic arthritis	(–) 994 (75.2)	979	75.4	15	65.2	.558	x^2
	(+) 328 (24.8)	320	24.6	8	34.8		
Duration of disease (month)		194.0 ± 141.6		193.5 ± 117.4		.741 [m]	

Note: "x^2" chi-square test; "[m]" Mann-Whitney U test.
Abbreviations: COPD, chronic obstructive pulmonary disease; IPF, interstitial pulmonary fibrosis.

TABLE 2 Treatment agents of psoriasis patients

Treatment agents	COVID-19 (–) (n = 1299) Mean ± SD/n%	COVID-19 (+) (n = 23) Mean ± SD/n%	Drug used All patients (n = 1322) Mean ± SD/n%	COVID (+) drug used in all patients
Etanercept	26 (2.0%)	0 (0.0%)	26 (2.0%)	0/1322 (0.0%)
Infliximab	10 (0.8%)	0 (0.0%)	10 (0.8%)	0/1322 (0.0%)
Adalimumab	90 (6.9%)	0 (0.0%)	90 (6.8%)	0/1322 (0.0%)
Ustekinumab	103 (7.9%)	2 (8.7%)	105 (7.9%)	2/1322 (0.1%)
Secukinumab	106 (8.2%)	4 (17.4%)	110 (8.3%)	4/1322 (0.3%)
Ixekizumab	22 (1.7%)	1 (0.1%)	23 (1.7%)	1/1322 (0.1%)
Certolizumab	19 (1.7%)	2 (8.7%)	21 (1.6%)	2/1322 (0.1%)
Risankizumab	1 (0.1%)	0 (0.0%)	1 (0.1%)	0/1322 (0.0%)
(MTX+ biologics)	9 (0.8%)	0 (0.0%)	9 (0.8%)	0/1322 (0.0%)
Topical	363 (27.9%)	6 (26.1%)	369 (27.9%)	6/1322 (0.4%)
Phototherapy	32 (2.4%)	0 (0.0%)	32 (2.4%)	0/1322 (0.0%)
Acitretin	213 (16.4%)	5 (21.7%)	218 (16.5%)	5/1322 (0.4%)
MTX	285 (21.9%)	3 (13.0%)	288 (21.8%)	3/1322 (0.2%)
Cyclosporine	20 (1.5%)	0 (0.0%)	20 (1.5%)	0/1322 (0.0%)

TABLE 3 Contact history and treatment characteristics of psoriasis patients

		COVID-19 (–) n	%	COVID-19 (+) n	%	*P*	
Has anyone you contacted been diagnosed with COVID-19?	(–)	1287	99.1%	12	52.2%	.000	x^2
	(+)	9	0.7%	11	47.8%		
Treatment of choice	Biological	379	29.2%	9	39.1%	.419	x^2
	Not biological	910	70.1%	14	60.9%	.470	x^2
	Biological + Methotrexate	10	0.8%	0	0.0%	.428	x^2
	Immunosuppressive[a]	691	53.2%	12	52.2%	.802	x^2
	Nonimmunosuppressive	608	46.8%	11	47.8%		

Note: "x^2" chi-square test.
[a]Immunosuppressive: Methotrexate, cyclosporine, biologics; Nonimmunosuppressive: Topical, acitretin.

TABLE 4 Characteristics of psoriasis patients diagnosed with probable/confirmed COVID-19 disease

Patient number	Age (years)/ gender	Comorbidities	Smoking/alcohol use	Therapy at the moment of diagnosis	Clinic	PCR (nasal/ pharyngeal swab)	CT	Hospitalization (yes/no) (If yes how many days)	ICU (yes/no)	Outcome
1	50/F	None	–	Topical	Symptomatic	Positive	–	Yes (5 d)	No	Recovered
2	35/M	DM, Obesity	7 pack/y (active smoker), social alcohol use	Topical	Symptomatic	Positive	+	Yes (7 d)	No	Recovered
3	24/M	None	–	Topical	Symptomatic	Positive	+	No (home treatment)	No	Recovered
4	32/F	None	–	Topical	Symptomatic	Positive	Not taken	No (home treatment)	No	Recovered
5	49/F	PsA	–	Topical	Symptomatic	Positive	+	Yes (2 d)	No	Recovered
6	53/M	None	15 pack/y (formerly smoker)	Topical	Symptomatic	Positive	+	Yes (12 d)	No	Recovered
7	28/M	None	8 pack/y-smoking (active)	Acitretin	Symptomatic	Positive	–	No (home treatment)	No	Recovered
8	42/F	Obesity, depression	3 pack/y (active smoker)	Acitretin	Symptomatic	Negative	+	No (home treatment)	No	Recovered
9	54/F	DM, obesity	–	Acitretin	Symptomatic	Negative	+	Yes (14 d)	No	Recovered
10	54/F	HT, obesity, PsA	–	Acitretin	Symptomatic	Positive	+	Yes (14 d)	No	Recovered
11	64/F	CAD, obesity, PsA	–	Acitretin	Symptomatic	Positive	Not taken	No (home treatment)	No	Recovered
12	57/F	Obesity	–	Methotrexate	Symptomatic	Positive	–	No (home treatment)	No	Recovered
13	54 /F	DM, HT, CAD, obesity, PsA	–	Methotrexate	Symptomatic	Negative	+	Yes (7 d)	No	Recovered
14	29/F	None	–	Methotrexate	Symptomatic	Positive	_	No (home treatment)	No	Recovered
15	44/M	None	10 pack/y (active smoker)	Secukinumab Anti-IL-17	Symptomatic	Positive	+	Yes (15 d)	No	Recovered
16	66/M	DM, HT, PsA	40 pack/y (formerly smoker)	Secukinumab Anti–IL-17	Symptomatic	Positive	–	No (home treatment)	No	Recovered
17	59/F	DM, obesity, PsA	–	Secukinumab Anti–IL-17	Symptomatic	Negative	+	Yes (5 d)	No	Recovered
18	73/F	DM, CA (previous)	–	Secukinumab Anti–IL-17	Symptomatic	Sample not gone	+	No (home treatment)	No	Recovered
19	45/F	DM, HT, obesity PsA	–	Certolizumab Anti-TNF-α	Symptomatic	Positive	Not taken	No (home treatment)	No	Recovered
20	49/M	PsA	–	Certolizumab Anti–TNF-α	Symptomatic	Positive	+	Yes (14 d)	No	Recovered

(Continues)

TABLE 4 (Continued)

Patient number	Age (years)/gender	Comorbidities	Smoking/alcohol use	Therapy at the moment of diagnosis	Clinic	PCR (nasal/pharyngeal swab)	CT	Hospitalization (yes/no) (If yes how many days)	ICU (yes/no)	Outcome
21	45/M	None	–	Ustekinumab Anti–IL-12/–23	Symptomatic	Positive	–	No (home treatment)	No	Recovered
22	35/M	Obesity	–	Ustekinumab Anti–IL-12/–23	Symptomatic	Positive	+	Yes (4 d)	No	Recovered
23	27/F	None	–	İxekizumab Anti–IL-17	Symptomatic	Positive	–	No (home treatment)	No	Recovered

Note: CT (+): bilateral peripheral ground-glass opacities; CT (–): no evidence for pneumonia.
Abbreviations: CAD, coronary artery disease; CT, computerized tomography; DM, diabetes mellitus; F, female; HT, hypertension, ICU, intensive care unit; IPF, interstitial pulmonary fibrosis; M, male; PsA, psoriatic arthritis.

COVID-19 infection from clinical, tomographic and other laboratory findings was also accepted for a diagnosis of COVID-19. In our study, with these findings, 23 patients were diagnosed with COVID-19 infection. In Table 3, the characteristics of the patients diagnosed with COVID-19 are presented. Eleven of 23 (47.8%) patients were hospitalized due to illness; mean hospitalization time was 8.4 ± 4.9 days. No patient stayed in the intensive care unit (ICU), and death due to the disease was not observed.

Fifty-five per cent of the patients (n = 15) diagnosed with COVID-19 experienced exacerbation of psoriasis after the disease. Eleven (47.8%) of 23 patients had a history of contact with COVID-19 positive people. In the COVID-19 (+) group, the history of contacting someone with COVID-19 was statistically significantly higher than in the COVID-19 (–) group (P = .000).

Of patients diagnosed with probable/confirmed COVID-19, 14 were female, and 9 were male. Nine of the 23 (39.1%) patients used biologic treatments. There was no statistically significant difference in terms of hospitalization from COVID-19 between patients using biologics (n = 9) and those not using them (n = 14) (P = 1.00). For hospitalization, there was no statistically significant difference between patients who used immunosuppressives (n = 12) and those who did not (n = 11) (P = .54).

The percentage of patients with COVID-19 did not differ between groups using biologics or immunosuppressives (Table 4).

According to the Nomenclature of Territorial Units for Statistics (NTUS-1), the number of laboratory-confirmed cases in Istanbul (from the date of the first case of COVID-19 reported in Turkey to 28 June 2020) was 108 749.[2]

Again according to NTUS-1 for the same period, the total deaths caused by COVID-19 were reported as 2687 for Istanbul and the incidence as 17.3.[2] Among the 1322 patients with psoriasis in our study, none of the 23 patients with COVID-19 infection died.

4 | DISCUSSION

Various studies have been conducted in the international literature on psoriasis during the COVID-19 pandemic period.[8-11] Bardazzi et al reached 238 patients by phone, and 176 were receiving biological or biosimilar treatments. Nasal swabs were taken in only two patients, and positivity was detected in both of them.[8] In a multicenter study from Northern Italy, the authors included 5206 psoriasis patients and found the incidence of COVID-19 to be 5.6 per 10 000 person-months, similar to 5.9 in the general population.[12] Carugno et al reported that there were no confirmed severe cases of COVID-19 observed in 159 psoriasis patients. Almost completely mild symptoms were observed even in patients who continued biological therapy. No aggressive course was detected.[13]

Megna et al evaluated 168 psoriasis patients via telephone between 9 March 2020 and 8 April 2020. Forty-five per cent were using anti-IL-17, 23% anti-TNF-alpha, 24% ustekinumab and 8.4% anti-IL23. While symptoms were observed in 3 of 168 patients, none had a nasal or pharyngeal swab confirming COVID-19.[11]

Ebrahimi et al conducted research in the MEDLINE database (PubMed) for the key terms "psoriasis biologic" and "COVID-19". They evaluated 8769 case-controlled medical reports, 17 case series and 1723 patients using biologics. They found that 0.3% of patients had COVID-19, with a 0.1% hospital stay, out of a total of 10 509 patients with psoriasis. No deaths were reported among the 10 509 patients.[7]

An Italian retrospective observational case-controlled study by Gisondi et al examined the hospital stay and mortality rates of 980 chronic plaque psoriasis patients who received biological or immunosuppressive therapy, and no hospitalization or death was observed.[12] However, 1.2% of 257 353 people residing in Verona were affected by COVID-19, with a 0.2% hospitalization rate and 0.08% mortality rate reported. Another study from Lombardy, Italy (10 060 574 residents) evaluated 1193 psoriasis patients, and patients on biologic therapy had increased risk of infection with SARS-CoV-2 and hospitalization, but no increased risk of ICU admission or death were observed compared to the general population (0.012% and 0.1%, respectively).[14]

According to the Turkey Statistical Institute's address-based population registration system, the population of Istanbul was 15 519 267 in 2019.[15] According to NTUS-1, the number of laboratory-confirmed COVID-19 cases in Turkey from the first case reported up to 28 June 2020 was 198 284; during the same period, Istanbul had 108 749 cases, a rate of 0.7%.[2] Our study observed COVID-19 in 23 of 1322 psoriasis patients (1.8%), a higher rate than that for the Istanbul population.

Again according to NTUS-1, up to 28 June 2020, the total number of deaths caused by COVID-19 was 2687 for Istanbul, with an incidence of 17.3.[2] Among the 1322 patients with psoriasis in our study, none of the 23 patients with COVID-19 infection died.

Our study was similar to previous studies. We found the percentage of patients with COVID-19 did not differ between those receiving biologic/immunosuppressive treatments and those who were not. There was no statistically significant difference in terms of hospitalization between patients using biologics (n = 9) and those who were not (n = 14) (P = 1.00); nor was there any statistically significant difference between the percentage of patients using immunosuppressives (n = 12) and those who were not (n = 11) (P = 0.54). No patient stayed in the ICU, and no deaths occurred due to COVID-19. According to our data, the frequency of COVID-19 does not increase in patients using immunosuppressants, including those receiving biological therapy with a diagnosis of psoriasis. Although the number of patients diagnosed with COVID-19 is not very high, the course of COVID-19 does not change with immunomodulating or immunosuppressive therapy. Interestingly, obesity, smoking, age and accompanying psoriatic arthritis were not among the factors affecting the frequency of COVID-19. We only encountered an increased risk in diabetic patients. We also found no difference between immunosuppressive treatments or biological agents in terms of susceptibility to COVID-19. However, an exacerbation of psoriasis was observed with the infection, which may be related to cessation of psoriasis treatments.

5 | LIMITATIONS

Grading on tomographic evaluation could be important in evaluating disease prognosis. Even though our study was multicentered, our data were limited to Istanbul. A similar study could be conducted with clinics located in different centers countrywide.

6 | CONCLUSION

Our study found no difference in patients with psoriasis in terms of getting COVID-19 while using biologics. Our study is the first multicentered study for Turkey on COVID-19 in patients with psoriasis. In this respect, it is important both for Turkey and for international data.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

Conception: Asude Kara Polat, Ayse Serap Karadag, Ilknur Kıvanc Altunay. Design: Asude Kara Polat, Ayse Serap Karadag, Ayse Esra Koku Aksu, Ilknur Kıvanc Altunay. Supervision: Asude Kara Polat, Ilteris Oguz Topal, Ayse Serap Karadag, Ayse Esra Koku Aksu, Ilknur Kıvanc Altunay, Burhan Engin. Data collection and/or processing: Asude Kara Polat; Ilteris Oguz Topal; Ayse Serap Karadag, Hasan Aksoy; Ayse Esra Koku Aksu; Filiz Topaloglu Demir; Tugba Ozkok Akbulut; Tugba Kevser Uzuncakmak; Ilknur Kıvanc Altunay. Analysis and/or interpretation: Asude Kara Polat; Ilteris Oguz Topal; Ayse Serap Karadag, Ayse Esra Koku Aksu; Ezgi Ozkur; Filiz Topaloglu Demir; Ilknur Kıvanc Altunay. Literature review: Asude Kara Polat; Ayse Serap Karadag; Ezgi Ozkur; Ilknur Kıvanc Altunay. Writing: Asude Kara Polat, Ayse Serap Karadag; Ayse Esra Koku Aksu; Ezgi Ozkur; Ilknur Kıvanc Altunay. Critical review: Asude Kara Polat; Ilteris Oguz Topal; Ayse Serap Karadag; Ayse Esra Koku Aksu; Ezgi Ozkur; Burhan Engin; Ilknur Kıvanc Altunay.

DATA AVAILABILITY STATEMENT

Data openly available in a public repository that issues datasets with DOIs.

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REFERENCES

1. World Health Organization. Novel Coronavirus (2019-nCoV) SITUATION REPORT- 1. January 21, 2020. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200121-sitrep-1-2019-ncov.pdf?sfvrsn=20a99c10_4.

2. COVID-19 Situation report, Turkey. https://covid19.saglik.gov.tr/Eklenti/37778/0/covid-19-durum-raporupdf.pdf?_tag1=B647A4A46C8B41228B2C445361452762CAEFD728.
3. World Health Organization. Coronavirus disease 2019 (COVID-19) Situation Report – 51. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200311-sitrep-51-covid-19.pdf?sfvrsn=1ba62e57_10.
4. WHO COVID-19 Case definition. https://www.who.int/publications/i/item/WHO-2019-nCoV-Surveillance_Case_Definition-2020.1.
5. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. *JAMA*. 2020;323(13):1239-1242.
6. Abdelmaksoud A, Goldust M, Vestita M. Comment on "COVID-19 and psoriasis: Is it time to limit treatment with immunosuppressants? A call for action". *Dermatol Ther*. 2020;e13360.33(4):
7. Ebrahimi A, Sayad B, Rahimi Z. COVID-19 and psoriasis: biologic treatment and challenges. *J Dermatolog Treat*. 2020;1-5.
8. Bardazzi F, Loi C, Sacchelli L, Di Altobrando A. Biologic therapy for psoriasis during the covid-19 outbreak is not a choice. *J Dermatolog Treat*. 2020;31(4):320-321.
9. Conforti C, Giuffrida R, Dianzani C, Di Meo N, Zalaudek I. Biologic therapy for psoriasis during the COVID-19 outbreak: the choice is to weigh risks and benefits. *Dermatol Ther*. 2020;e13490.33(4):
10. Di Lernia V, Goldust M, Feliciani C. Covid-19 infection in psoriasis patients treated with cyclosporin. *Dermatol Ther*. 2020;e13739.33(4):
11. Megna M, Ruggiero A, Marasca C, Fabbrocini G. Biologics for psoriasis patients in the COVID-19 era: more evidence, less fears. *J Dermatolog Treat*. 2020;31(4):328-329.
12. Gisondi P, Facheris P, Dapavo P, et al. The impact of the COVID-19 pandemic on patients with chronic plaque psoriasis being treated with biological therapy: the northern Italy experience. *Br J Dermatol*. 2020;183(2):373-374.
13. Carugno A, Gambini DM, Raponi F, et al. COVID-19 and biologics for psoriasis: a high-epidemic area experience-Bergamo, Lombardy, Italy. *J Am Acad Dermatol*. 2020;83(1):292-294.
14. Damiani G, Pacifico A, Bragazzi NL, Malagoli P. Biologics increase the risk of SARS-CoV-2 infection and hospitalization, but not ICU admission and death: real-life data from a large cohort during red-zone declaration. *Dermatol Ther*. 2020;e13475.33(5):
15. https://data.tuik.gov.tr/Bulten/Index?p=Adrese-Dayali-Nufus-Kayit-Sistemi-Sonuclari-2019-33705.

How to cite this article: Kara Polat A, Oguz Topal I, Karadag AS, et al. The impact of COVID-19 in patients with psoriasis: A multicenter study in Istanbul. *Dermatologic Therapy*. 2021;34:e14691. https://doi.org/10.1111/dth.14691