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Incidence of severe COVID-19 outcomes in psoriatic patients treated with systemic therapies during the pandemic: A Biobadaderm cohort analysis



To the Editor: The use of systemic treatments in psoriatic patients during the pandemic has been the subject of extensive debate. In March 2020, we performed a specific study within the cohort of Biobadaderm Registry, a previously described national, multicenter, prospective cohort.¹

Our primary objective was to analyze the incidence of COVID-19 infections and severe outcomes in a cohort of psoriatic patients treated with systemic therapies and to compare it with that of the general population.

We reviewed all Biobadaderm patient records and contacted the patients when needed. We collected information about current comorbidities related to COVID-19 and COVID-19 outcomes in all active patients of the registry. We used the latest data updated on July 6, 2020.

We estimated the age and sex standardized incidence ratio (SIR) defined as the ratio of the observed cases to the expected number of cases according to the Spanish population. The main analysis examined hospitalization, intensive care unit (ICU) admissions, and death in polymerase chain reaction (PCR)-confirmed patients included in Biobadaderm compared with PCR-confirmed cases published by the Spanish Ministry of Health.² Also 95% confidence intervals (CI) were calculated for each SIR to compare significance between the Spanish figures and those of Biobadaderm.

In our study, we found that of 2329 current active patients with systemic therapy, 73 patients (3.13%) had suffered from COVID-19, 13 patients (0.56%) required hospitalization, 1 patient (0.04%) needed ICU care, and 1 (0.04%) patient died. Patient characteristics are detailed in [Table I](#). The profile of COVID-19 cases was similar to that of the population

of origin (Biobadaderm) in age and sex,³ but with higher percentages of comorbidities like hypertension (27% vs 22%) or diabetes mellitus (16% vs 11%).

In our main analysis ([Table II](#)), the SIR for COVID-19 infection, hospitalization, ICU care, and death were slightly higher in psoriatic patients treated with systemic therapies compared with the general population of Spain, but this was not significant: 1.58 (0.98-2.41), 1.55 (0.67-3.06), 1.78 (0.05-9.93), 1.38 (0.03-7.66), respectively.

The results are consistent with the article published by Gisoni et al³ during the peak of the Italian pandemic that suggests that psoriatic patients receiving biologic treatments are not associated with worse outcomes.

Strengths of this study are that we analyzed a prospective cohort, we know the base population, and we can calculate the incidences. This study, therefore, avoids problems of other ongoing international registries based on case notifications, which do not have a well-defined base population and likely suffer from selection bias.⁴ Although the first data were reassuring at the start of the pandemic, some authors consider that it is necessary to confirm them using prospective studies of incidence with adequate denominators.⁵

The limitations of this study include the lack of serologic or molecular confirmations for the diagnosis of COVID-19 of all possible cases, which is because in cases of mild courses of the disease, testing was often not done during the period of the study.

The findings of this prospective cohort study suggest that classic systemic or biologic treatments increase neither the susceptibility nor the severity of COVID-19.

This work was conducted within the BIOBADADERM Study Group. The following members participated in acquisition of data and review of the manuscript: Esteban Daudén, Mar Llamas-Velasco, Cristina Santamaría (Hospital Universitario de la Princesa); Gregorio Carretero, Jaime Vilar-Alejo, Blanca Madrid Álvarez (Hospital Universitario de Gran Canaria Dr Negrín); Raquel Rivera, Carmen García-Donoso, M^a del Mar Onteniente Gomis, Diana Batista Cabrera (Hospital Universitario 12 de Octubre); Carlos Ferrándiz, José Manuel Carrascosa, Ferrán Ballescá (Hospital Universitari Germans Trias i Pujol); Pablo de la Cueva, Patricia Molina Mejías (Hospital Universitario Infanta Leonor); Isabel Belinchón, Carlos García Giner, Alfred Perez (Hospital General Universitario de Alicante); Fran J. Gómez-García (Hospital Universitario Reina Sofía); Enrique Herrera-Ceballos, Enrique Herrera-Acosta, Eliseo Martínez-García, Cristina Sánchez (Hospital Universitario Virgen de la Victoria); José Luis

Table I. SARS-CoV-2 infection characteristics of patients treated with systemic therapies

Characteristics	SARS-CoV-2 infection						
	Possible case,* n = 36 (%)	Probable case,† n = 16 (%)	PCR confirmed case,‡ n = 21 (%)	Hospitalized case, n = 13 (%)	ICU case, n = 1 (%)	Death case, n = 1 (%)	All cases, n = 73 (%)
Sex							
Male	21 (58)	11 (69)	11 (52)	10 (77)	0 (0)	1 (100)	43 (59)
Female	15 (42)	5 (31)	10 (48)	3 (23)	1 (100)	0 (0)	30 (41)
Age (y), median (p25-p75)	51.3 (38.8-59.8)	49.9 (32.7-54.6)	54.8 (49.6-68.3)	54.8 (51.5-68.3)	51.2 (NA)	79.5 (NA)	51.8 (39.6-60.0)
Plaque psoriasis, yes	35 (97)	15 (94)	19 (90)	12 (92)	1 (100)	1 (100)	69 (95)
Psoriatic arthritis, yes	2 (6)	2 (13)	5 (24)	4 (31)	1 (100)	0 (0)	9 (12)
Treatment							
Anti-TNF	6 (16)	5 (31)	2 (10)	1 (8)	0 (0)	0 (0)	13 (18)
Classic systemics treatments	3 (9)	2 (12)	4 (19)	2 (15)	0 (0)	0 (0)	9 (12)
Anti-IL-12/IL-23	9 (25)	4 (25)	3 (14)	4 (31)	0 (0)	0 (0)	16 (22)
Anti-IL17	6 (17)	5 (32)	2 (10)	1 (8)	0 (0)	0 (0)	13 (18)
Apremilast	6 (17)	0 (0)	6 (29)	2 (15)	0 (0)	1 (100)	12 (16)
Fumarates	1 (3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)
Anti-IL-23p19	5 (14)	0 (0)	4 (19)	3 (23)	1 (100)	0 (0)	9 (12)
Changes in current treatment							
No	29 (81)	12 (75)	20 (95)	12 (92)	1 (100)	1 (100)	61 (84)
Preventive minimization	3 (8)	2 (13)	0 (0)	0 (0)	0 (0)	0 (0)	5 (7)
Preventive suspension	4 (11)	2 (13)	1 (5)	1 (8)	0 (0)	0 (0)	7 (10)
Hypertension, yes	11 (31)	3 (19)	6 (29)	5 (38)	0 (0)	1 (100)	20 (27)
Diabetes mellitus, yes	7 (19)	2 (13)	3 (14)	5 (38)	0 (0)	0 (0)	12 (16)
Cardiovascular disease, yes	6 (17)	2 (13)	4 (19)	4 (31)	0 (0)	1 (100)	12 (16)
Respiratory tract disease, yes§	8 (22)	4 (25)	1 (5)	3 (23)	0 (0)	NA	13 (18)
ARA II or ACE treatments, yes	8 (22)	3 (19)	5 (24)	4 (31)	0 (0)	1 (100)	16 (22)
Relative hospitalized or death by COVID-19*	3 (10)	2 (17)	2 (22)	5 (100)	1 (100)	NA	7 (14)
Time since first symptom, median (p25-p75)*	20.5 (12-26)	23 (15-41)	18 (13.5-30)	23 (13-30)	30 (NA)	14 (NA)	20 (13-30)
COVID-19 outcome							
Mild symptoms or asymptomatic	35 (97)	12 (75)	11 (52)	0 (0)	0 (0)	0 (0)	58 (79)
Hospitalization	1 (3)	4 (25)	8 (38)	13 (100)	0 (0)	0 (0)	13 (18)
ICU admission or similar	0 (0)	0 (0)	1 (5)	0 (0)	1 (100)	0 (0)	1 (1)
Death	0 (0)	0 (0)	1 (5)	0 (0)	0 (0)	1 (100)	1 (1)

ARA II, angiotensin II receptor antagonists; ACE, angiotensin-converting enzyme; IL, interleukin; TNF, tumor necrosis factor.

*Possible case: febrile respiratory infection with compatible symptoms.

†Probable case: clinical criteria with an epidemiological link or any person meeting the diagnostic criteria.

‡Confirmed case: laboratory confirmation of SARS-CoV-2, irrespective of clinical signs and symptoms.

§Few missing data.

Table II. Adjusted Cumulative Incidence and Standardized Incidence Ratio of psoriatic patients treated with systemic therapies and compared with equivalent definition in the general population of Spain

	Observed cases in Biobadaderm	Expected cases	Adjusted cumulative incidence 9 5CI% (per 100,000 patient-years)	SIR 95 CI%
All PCR-confirmed cases vs Spanish-confirmed cases	21	13.3	959.5 (593-1469)	1.58 (0.98-2.41)
PCR Hospitalized cases vs Spanish hospitalized cases	8	5.2	349.8 (149.4-692.6)	1.55 (0.67-3.06)
PCR ICU cases vs Spanish ICU cases	1	0.6	33.5 (0-192)	1.78 (0.05-9.93)
PCR death cases vs Spanish death cases	1	0.7	69.5 (0-398.3)	1.38 (0.03-7.66)

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Pfizer, Janssen, Novartis, Lilly, and Abbott and has participated as speaker for Almirall, Janssen, and Gebro Pharma. Dr Rodríguez Fernández-Freire acted as a consultant and speaker for Janssen-Cilag, AbbVie, MSD, Pfizer, Novartis, Lilly, Almirall, Celgene, and Leo-Pharma. Dr Carretero has been reimbursed by Janssen, Abbvie, Novartis, Pfizer, MSD, and Celgene for advisory service and conference. Dr García-Donoso participated as AB from AbbVie and Almirall and speaker for Janssen, Lilly, and Celgene. Dr Llamas-Velasco acted as a consultant and speaker and participated in clinical trials for Janssen-Cilag, AbbVie, Celgene, Pfizer, Novartis, Lilly, Almirall, and Leo-Pharma. Dr Herrera-Ceballos has served as a consultant and/or speaker for and/or participated in clinical trials as IP and sponsored by companies that manufacture drugs used for the treatment of psoriasis, including AbbVie, Janssen-Cilag, LEO Pharma, Lilly, Novartis and Pfizer. Dr Botella-Estrada has served as a consultant and/or paid speaker for and/or participated in clinical trials sponsored by companies that manufacture drugs used for the treatment of psoriasis, including AbbVie, Celgene, Janssen-Cilag, LEO Pharma, Lilly, Novartis, and Pfizer. Dr Ruiz-Genao has been reimbursed by Pfizer, Janssen, Celgene, Abbvie, Novartis, and LeoPharma for advisory services and conferences. Dr Riera-Monroig received travel grants for congresses from Abbvie, Almirall, Janssen, LEO-Pharma, and Novartis. Dr Garcia-Doval received travel grants for congresses from Abbvie, MSD, and Pfizer. None of the other authors has any conflicting interests to disclose.

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Analysis of availability of online dermatology appointments during the COVID-19 pandemic



To the Editor: ZocDoc is an online appointment scheduling platform that hosts thousands of independent practices and hospitals.¹ Wait times for online dermatology appointments have been reported; to our knowledge, the impact of COVID-19 on appointment availability and wait times has not been studied.² Our objective was to characterize dermatology appointment wait times on ZocDoc based on dermatologist density during the COVID-19 pandemic.

In April 2020, searches for “dermatologist” were conducted on ZocDoc in chronological order of the most to least dermatologist-dense areas in the United States as of 2016.³ Overlapping providers between cities and duplicate providers were excluded. Data analyzed included provider characteristics, days until the next available appointment, and video appointment availability. Descriptive statistics were generated, and Pearson correlation coefficients and *t* tests were calculated. All data analyses were performed by using the Excel Data Analysis Toolpak (Microsoft Corporation, Redmond, WA).

A total of 615 providers were obtained for 20 searches on ZocDoc; 67% were dermatologists (Table I). Mean appointment wait times for the most and least dermatologist-dense locations were 3.9 and 6.8 days, respectively. There was no significant correlation between provider density and wait times and no significant difference in overall mean wait times for dermatologists (5.7 days) versus nondermatologists (5.4 days). When stratified by specialty, overall mean wait times ranged from 2 to 6 days, excluding primary care (17.3 days).

All providers in Bethesda/Rockville, MD; Swainsboro, GA; Amarillo, TX; and Yakima, WA offered video appointments (Supplemental Fig 1; available via Mendeley at <https://doi.org/10.17632/>

Table I. ZocDoc appointment search results for “dermatologist” in the most and least dermatologist-dense locations

Characteristics	Density rank																				
	1	2	3	4	5	6	7	8	9	10	703	704	705	706	707	708	709	710	711	712	
Location	Upper East Side, NY	Palo Alto, CA	Santa Monica, CA	Boston, MA	Middlesex County, MA	Lower Manhattan, NY	Hanover, NH	Bethesda and Rockville, MD	Annapolis, MD	Portland, ME	Swainsboro, GA	Amarillo, TX	Flint, MI	South Bend, IN	Dayton, OH	Mojave, CA	Beaumont, TX	Yakima, WA	Lexington, KY	Jamaica, NY	
Providers, n	116	107	63	54	4	18	2	54	2	0	32	30	18	20	4	12	39	24	0	16	
Specialty, n (%)																					
Dermatology	113 (97.4)	75 (70.1)	47 (74.6)	32 (59.3)	1 (25.0)	16 (88.9)	2 (100.0)	35 (64.8)	2 (100.0)	17 (53.1)	4 (13.3)	11 (61.1)	5 (25.0)	4 (100.0)	8 (66.7)	14 (35.9)	11 (45.8)				16 (100.0)
Family medicine	18 (16.8)	5 (7.9)	4 (6.3)	12 (22.2)	1 (25.0)		9 (16.7)	7 (13.0)		1 (3.1)	10 (33.3)	4 (22.2)	6 (30.0)		1 (8.3)	12 (30.8)	2 (8.3)				
Internal medicine	5 (4.7)	4 (6.3)	6 (11.1)	1 (1.9)	1 (25.0)	2 (11.1)				1 (3.1)	1 (3.3)	1 (5.6)	2 (10.0)		1 (8.3)	5 (12.8)					
Physician assistant	3 (2.6)									12 (37.5)	8 (26.7)			1 (5.0)							
Nurse practitioner	1 (0.9)	1 (1.6)	1 (1.6)	3 (5.6)	1 (25.0)					1 (3.1)	7 (23.3)			2 (11.1)		1 (8.3)	3 (7.7)	2 (8.3)			
Primary care	2 (1.9)	2 (3.2)												5 (25.0)		2 (5.1)	4 (16.7)				
Other																					
Addiction	1 (0.9)																				
Cardiology																					
Allergist								1 (1.9)													
								1 (1.9)													

Continued