Title

The role of gender, race, and ethnicity in psoriasis patients with COVID-19 infection: A cross-sectional study.

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The role of gender, race, and ethnicity in psoriasis patients with COVID-19 infection: A cross-sectional study

Keywords: COVID-19, epidemiology, infectious disease, psoriasis, racial and ethnic disparities

Dear Editors,

Patients receiving biologic treatments may have reduced hospitalization risk from severe COVID-19 infection[1–3]; however, data on the risk, racial disparities, and outcomes for COVID-19 in patients with psoriasis is limited. It is postulated that Hispanic and other minority races who are uninsured face barriers to accessing COVID-19 testing and services. We evaluated the rates of COVID-19 infection, hospitalization, and mortality among psoriasis patients in a California-based population.

This cross-sectional study used the University of California COVID Research Data Set, a Health Insurance Portability and Accountability Act-limited medical records dataset for patients tested for COVID-19 across University of California medical centers.[4] Psoriasis diagnosis, COVID-19 testing, self-reported demographics, hospitalizations (within 2 weeks of COVID-19 test as a marker of infection severity), and mortality were collected. Specific biologic (adalimumab, ustekinumab, secukinumab, guselkumab, and etanercept) and systemic (cyclosporine and methotrexate) treatment for at least 30 days prior to COVID-19 testing were identified. Fisher exact and χ^2 tests were used for statistical analysis, with Bonferroni correction used for multiple comparisons.

Data from 290,838 patients is included in University of California COVID Research Data Set (March 2020 to October 2020), with a 3.6% (n = 10,438) positive test rate. Of these, 3566 patients had a diagnosis of psoriasis, with a 2.4% (n = 87) positive infection rate; lower than the 3.6% (n = 10,351) infection rate for those without psoriasis (P = .0002) (Table 1). This observation remained true when separately analyzing women (2.2%, P = .036) and men (2.7%, P = .0189) with psoriasis. There were no significant differences in hospitalization or mortality rate for COVID-19 positive psoriasis patients compared to those without psoriasis (P = .5523, P = .1182, respectively). Similarly, female psoriasis patients did not have significantly increased risk for COVID-19 infection, hospitalization, or mortality compared with females without psoriasis. Study results also showed no clear gender predisposition for COVID-19–related infection and complications. Lastly, there was no significant difference in infection, hospitalization, or mortality rate for psoriasis patients on systemic or biologic agents in comparison to psoriasis patients not on these treatments (P > .05) (Table 1).

When analyzing race and ethnicity data, patients without psoriasis had higher COVID-19 infection (8.4%) and hospitalization rates (23.7%) in Hispanic patients compared with non-Hispanic patients (2.0%, 19.9%, P < .00001) (Table 2). Similarly, within the psoriasis subset, Hispanic patients had higher infection (7.2%) and hospitalization rates (26.7%) compared with non-Hispanic patients (1.9%, P < .00001; 19.6%, P = .1120, respectively).

Psoriasis patients did not have increased risk for COVID-19 infection, hospitalization, or mortality, regardless of treatment modality. This may be due to interleukin-17 or tumor necrosis factor-alpha blockade that ameliorates the inflammatory cytokine storm implicated in the sequelae of COVID-19 infection,[3] and better precautions taken by patients on biologics or immunosuppressive treatments.[5] Racial disparities depicted from our study results suggest that health inequalities may be further exacerbated by the pandemic.

Limitations include the small sample size of COVID-19 positive patients with psoriasis, use of tertiary center data, de-identified data with lack of clinical details, or follow-up. Future studies with identifiable datasets and analysis of gender influences within the Hispanic population will help better assess this relationship. Understanding the mechanisms underlying COVID-19 susceptibility is fundamental to developing better guidelines for populations at risk.

What is known about this subject in regard to women and their families?

- Psoriasis affects men and women equally, with increased incidence in adults compared with children.
- Psoriasis severity may vary due to demographics, geography, and presence of comorbidities.
- Comorbid conditions associated with psoriasis, such as cardiovascular and metabolic disease, may increase risk for poor outcomes associated with COVID-19 infection.

What is new from this article as messages for women and their families?

- Female patients with psoriasis did not have increased risk of COVID-19 infection, hospitalization, or mortality compared with female patients without psoriasis.
- Biologic medications did not increase risk of COVID-19 infection, hospitalization, or mortality in patients with psoriasis.
- Hispanic patients had significantly higher rates of COVID-19 infection and hospitalization compared with non-Hispanic patients, suggesting racial and ethnic disparities may be exacerbated by the pandemic.

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Table 1.

Psoriasis patients within the UC CORDS who tested positive for COVID-19 and had been on medication for psoriasis for at least 30 days prior to COVID-19 test compared with patients without psoriasis and not on medications, respectively (up to October 29, 2020)

Variables	COVID-19 (+) test			Hospitalizations COVID-19 (+)[b]			Mortality COVID-19 (+)[c]		
Condition (age range, average age—y)	Psoriasis, *n* (%)	Control, *n* (%)[d]	*P*[a]	Psoriasis, *n* (%)	Control, *n* (%)[d]	*P*[a]	Psoriasis, *n* (%)	Control, *n* (%)[d]	*P*[a]
Total (24–89, 51)	87 (2.4)	10,351 (3.6)	.0002	19 (21.8)	1999 (19.3)	.5523	4 (4.6)	221 (2.1)	.1182
Male[f]	45 (2.7)	5026 (3.8)	.0189	13 (28.9)	1114 (22.2)	.2801	3 (6.7)	132 (2.6)	.1169
Female[f]	42 (2.2)	5325 (3.4)	.0036	6 (14.3)	885 (16.6)	.6855	1 (2.4)	89 (1.7)	.5098
Medication (age range, average age—y)	**On medication, *n* (%)**	**Control, *n* (%)[e]**	***P*[a]**	**On medication, *n* (%)**	**Control, *n* (%)[e]**	***P*[a]**	**On medication, *n* (%)**	**Control, *n* (%)[e]**	***P*[a]**
Systemic (26–69, 60)	4 (2.9)	83 (2.4)	.5761	2 (50.0)	17 (20.5)	.2063	0 (0)	4 (4.8)	N/A
Biologic (16–78, 51)	7 (2.5)	80 (2.4)	.9850	1 (14.3)	18 (22.5)	1	0 (0)	4 (5.0)	N/A

N/A, not applicable; UC CORDS, University of California COVID Research Data Set; wk, weeks; y, years.

[a] Statistical analysis of those with psoriasis to those without psoriasis using χ^2 test for >5 patients or Fisher exact test for <5 patients; significant if <.05.

[b] Hospitalization within 2 wk (1 wk prior or subsequent to testing) of COVID-19 test.

[c] Death any time after COVID-19 test.

[d] Patients without psoriasis.

[e] Patients with psoriasis who are not on the specified medications.

[f] Gender is self-identified by the patients on their initial intake forms.

Table 2.

Infection, hospitalizations, and mortality rates of patients testing positive for COVID-19 by race and ethnicity within UC CORDS cohort

	White, non-Hispanic[f]	Asian, non-Hispanic		Black, non-Hispanic		Hispanic		Other[d]
Variables	*n* (%)	*n* (%)	*P*[a]	*n* (%)	*P*[a]	*n* (%)	*P*[a]	*n* (%)
COVID-19 (+) test								
Control[e]	2514 (2.0%)	607 (2.4%)	.00001	543 (3.4%)	<.00001	4355 (8.4%)	<.00001	2332 (3.8%)
Psoriasis	41 (1.8%)	11 (3.1%)	.0947	0 (0%)	.2589	30 (7.2%)	<.00001	5 (1.2%)
Hospitalizations COVID-19 (+)[b]								
Control[e]	462 (18.4%)	149 (24.6%)	.0001	137 (25.2%)	.00005	1032 (23.7%)	<.00001	219 (9.4%)
Psoriasis	10 (24.4%)	0 (0%)	.0192	0 (0%)	.2	8 (26.7%)	.1655	1 (25.0%)
Mortality COVID-19 (+)[c]								
Control[e]	59 (12.8%)	27 (18.1%)	.00009	17 (12.4%)	.5747	100 (9.7%)	.1781	18 (8.2%)
Psoriasis	3 (7.3%)	0 (0%)	.2	0 (0%)	.2	1 (3.3%)	1.0	0 (0%)

UC CORDS, University of California COVID Research Data Set; wk, weeks.

[a] Statistical analysis compared with White, non-Hispanic population using χ^2 test for >5 or Fisher exact test for <5 patients; significant if <.02 with Bonferroni correction for multiple comparisons.

[b] Hospitalization within 2 wk (1 wk prior or subsequent to testing) of COVID-19 test.

[c] Death any time after COVID-19 test.

[d] Includes Pacific Islander/Hawaiian Native, American Indian, multiracial, other, and unknown.

[e] Patients without psoriasis.

[f] Race and ethnicity are self-reported by the patients on their initial intake forms.

Conflicts of interest

None.

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Study approval

N/A.

Disclaimer

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