Atopic dermatitis is not associated with SARS-CoV-2 outcomes

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Background

Atopic dermatitis (AD) is associated with systemic T-helper 2 activation and respiratory comorbidities, e.g. asthma and allergic rhinitis. Concern exists regarding potential for poorer COVID-19 outcomes in AD patients. Few studies explored associations of AD with COVID-19 outcomes and had mixed findings.

Research Objectives

We investigated the relationship between AD and COVID-19 outcomes in adults.

Methods

- Retrospectively analyzed data from the George Washington University medical records for patients treated for SARS-CoV-2.
- Sociodemographics of the cohort were compared between those with vs. without AD and COVID-19 using chi-square and student's t-test.
- Binary logistic regression models were constructed with COVID-19 outcomes as dependent variables (acuity level of initial medical contact, hospitalization, hospitalization duration, COVID-19 symptom severity, requirement of supplemental oxygen therapy, mortality and long-term morbidity) and AD as the independent variables.
- Multivariable models were adjusted for socio-demographics and comorbidities. Crude and adjusted odds ratio (OR) and 95% confidence intervals (CI) were estimated. Intubation, extracorporeal membrane oxygenation and coagulation events were underpowered for analysis.

Results

- 436 adults with SARS-CoV-2, 48 (11.2%) with diagnosed AD
- 81.25% AD patients were non-white.
- No significant differences of age, BMI, sex, race, insurance coverage, malignancy or AIDS diagnoses or immunosuppressant use between those with vs. without AD.
- Patients *with* vs. *without* AD had lower rates of diabetes mellitus (DM; 12.50% vs. 25.65%, P=0.0449) and higher rates of obstructive lung disease (OLD; 37.50% vs. 18.06%; P=0.016).
- COVID-19 severity was associated with older age, higher BMI, non-white race, immunosuppressant use, diabetes mellitus, OLD, hypertension and chronic kidney disease.
- In unadjusted and adjusted regression models, AD patients had similar odds compared to patients without AD for all studied COVID-19 outcomes (Table 1).

Results (continued)

Table 2. Association of atopic dermatitis with COVID-19 severity and hospitalization.

Outcome	Atopic Dermatitis n (%)		Crude OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value
	Yes	No				
Hospitalization#						
No	38 (84.44)	259 (71.75)	1.00 (ref)	–	1.00 (ref)	–
Yes	7 (15.56)	102 (28.25)	0.47 (0.20-1.08)	0.0756	0.51 (0.20-1.35)	0.1772
Visit Type#						
Outpatient	22 (45.83)	141 (37.11)	1.00 (ref)	–	1.00 (ref)	–
Inpatient	26 (54.17)	239 (62.89)	0.70 (0.38-1.28)	0.2424	0.67 (0.35-1.30)	0.2304
Oxygen Therapy#						
No	41 (85.42)	313 (83.47)	1.00 (ref)	–	1.00 (ref)	–
Yes	7 (14.58)	62 (16.53)	1.07 (0.45-2.51)	0.8788	1.33 (0.55-3.58)	0.5686
COVID-19 Severity#						
Asymptomatic-Mild	42 (87.50)	314 (82.85)	1.00 (ref)	–	1.00 (ref)	–
Severe-Critical	6 (12.50)	65 (17.15)	0.69 (0.28-1.70)	0.4178	0.82 (0.29-2.30)	0.7062
Hospital duration#						
1-6 days	3 (42.86)	59 (59.60)	1.00 (ref)	–	1.00 (ref)	–
≥7 days	4 (57.14)	40 (40.40)	1.97 (0.42-9.26)	0.3924	2.24 (0.36-13.85)	0.3857
Course##						
Recovered	46 (97.87)	338 (94.15)	1.00 (ref)	-	1.00 (ref)	-
Chronic complications	1 (2.13)	12 (3.34)	0.61 (0.08-4.82)	0.6412	0.58 (0.06-5.31)	0.6328
Death	0 (0)	9 (2.51)	<0.001 (<0.001->999)	0.9631	0.002 (<0.001->999)	0.7781

Binary logistic regression models were constructed with atopic dermatitis diagnosis as the independent variable and COVID-19 outcomes as the dependent variables. Dependent variables included hospitalization (yes vs. no), visit type (inpatient vs. outpatient), oxygen therapy (yes vs. no), COVID-19 severity (severe-critical vs. asymptomatic-mild) and hospital duration (1-6 days vs ≥7 days).
Multinomial logistic regression models were constructed with atopic dermatitis diagnosis as the independent variable (yes/no) and COVID-19 course as the dependent outcome variable (chronic complications or death vs recovered).
Crude odds ratios (OR) and 95% confidence intervals (CI) were generated for unadjusted models. Adjusted OR and 95% CI were generated for age [continuous], sex [male/female], race [white/non-white], diagnosis of cancer [yes/no], AIDS [yes/no], immunosuppressant use [yes/no], smoking [current-former/never], BMI [continuous], insurance status [public/private].

Conclusions

- Findings were consistent with currently published literature suggesting AD patients are not at increased risk of worse COVID-19 outcomes.
- We studied COVID-19 outcomes not yet explored in the literature; uniquely, we demonstrate AD does not increase risk for supplemental oxygen therapy or chronic COVID-19 complications.
- Limitations: small sample size of AD patients, recruitment from a single metropolitan academic center, racial homogeneity and lack of stratified analysis by SARS-CoV-2 variants or AD features.

Disclosures

None