The Clinical and Humanistic Burden of Mild-to-Moderate Atopic Dermatitis in the United States: Analyses of the National Health and Wellness Survey

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BACKGROUND

- AD is a chronic inflammatory disorder with a 1-year prevalence of 10% in the US general population[1]
- It is associated with substantial burden
  - Patients experience increased rates of anxiety, depression, and sleep disorders compared with matched non-AD controls and report significantly lower QoL[2]
  - Among chronic skin conditions, AD has the greatest impact on QoL,[3,4] and, among chronic diseases overall, its impact is second only to that of cerebral palsy and greater than that of cystic fibrosis and diabetes[3]
- Few studies have explored patient-reported burden in mild-to-moderate AD

OBJECTIVES

- **To assess the patient burden of mild-to-moderate AD among US adults compared with matched non-AD controls**
- **To quantify the association between AD disease severity and QoL and psychosocial impact**

METHODS

Participants

- The NHWS is an annual, cross-sectional, Internet-based survey of adults (18 years and older) conducted across multiple countries and captures information on demographics, health characteristics, disease history, and health outcomes
- This study included US adult participants from the 2017 NHWS who reported physician-diagnosed AD (and/or eczema) with self-reported severity of mild or moderate, and propensity-matched respondents without AD/eczema (non-AD controls)
  - Propensity score matching was based on statistical comparisons between demographic and clinical characteristics. Those characteristics with *P* values <0.10 were entered into a logistic regression to calculate propensity scores that were then used to match each individual in the AD cohort with an individual in the non-AD control cohort

Assessments

- Rates of self-reported comorbidities (yes/no), anxiety in the preceding 12 months, depression severity (PHQ-9), sleep difficulties in the past 12 months (none to severe, 4-level verbal rating scale), health status (EQ-5D-5L), and QoL (SF-36v2) were assessed
- Individuals in the AD cohort were compared with propensity score–matched non-AD controls using χ^2 or analysis of variance

RESULTS

- Overall, 4496 respondents reported an AD diagnosis of any severity
- Of these, 4321 reported mild or moderate AD
  - The majority (74.5%) reported mild severity (**Table 1**)
- Substantial comorbidity was observed in respondents with mild-to-moderate AD compared with non-AD controls (**Figure 1**)
- More respondents with mild-to-moderate AD experienced anxiety, moderate-to-severe depression, and moderate-to-severe sleep difficulties than did non-AD controls (**Table 2**)
  - Likewise, the impact of sleep difficulties was greater in respondents with mild-to-moderate AD than in non-AD controls (**Table 2**)
- An increased burden in patients with mild-to-moderate AD compared with that in non-AD controls was consistently observed in health status (EQ-5D-5L) (**Table 2**) and QoL (SF-36v2) (**Figure 2**)
  - Impact on health status was apparent in both the EQ-5D-5L index score and the VAS score (**Table 2**)
  - Impact on QoL was reported consistently for SF-36v2 mental and physical component summary scores and across all 8 domain scores (**Figure 2**)

Table 1. Demographic and Clinical Characteristics

	Non-AD Controls N=4321	Mild-to-Moderate AD N=4321	Mild AD N=3218	Moderate AD N=1103	*P* Value[a]
Age, mean (SD), years	42.3 (17.0)	42.9 (17.3)	43.9 (17.5)	39.9 (16.2)	0.10
Female, n (%)	3037 (70.3)	2987 (69.1)	2176 (67.6)	811 (73.5)	0.24
BMI, n (%), kg/m²					
Underweight (<18.5)	88 (2.0)	112 (2.6)	77 (2.4)	35 (3.2)	
Normal weight (18.5 to <25)	1476 (34.2)	1463 (33.9)	1078 (33.5)	385 (34.9)	
Overweight (25 to <30)	1139 (26.4)	1180 (27.3)	892 (27.7)	288 (26.1)	0.23
Obese (≥30)	1490 (34.5)	1426 (33.0)	1073 (33.3)	353 (32.0)	
Missing/unknown	128 (3.0)	140 (3.2)	98 (3.1)	42 (3.8)	
Charlson comorbidity index, n (%)					
0	3626 (83.9)	3527 (81.6	2648 (82.3)	879 (79.7)	
1	371 (8.6)	396 (9.2)	280 (8.7)	116 (10.5)	
2	227 (5.3)	247 (5.7)	186 (5.8)	61 (5.5)	0.0020
≥3	97 (2.2)	151 (3.5)	104 (3.2)	47 (4.3)	

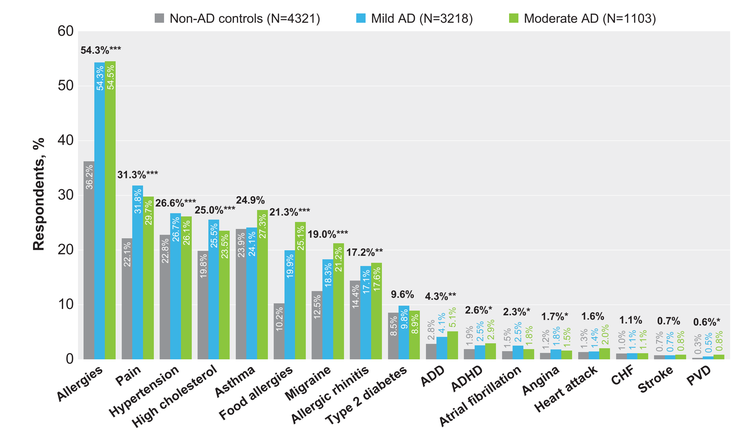
[a]*P* values for mild-to-moderate AD versus non-AD controls.

Table 2. Psychosocial Burden

	Non-AD Controls N=4321	Mild-to-Moderate AD N=4321	Mild AD N=3218	Moderate AD N=1103	*P* Value[a]
Anxiety, n (%)	1719 (39.8)	2131 (49.3)	1557 (48.4)	574 (52.0)	<0.0001
Depression severity,[b] n (%)					
None to minimal (0-4)	2595 (60.1)	2301 (53.3)	1799 (55.9)	502 (45.5)	
Mild (5-9)	819 (19.0)	997 (23.1)	731 (22.7)	266 (24.1)	
Moderate (10-14)	457 (10.6)	473 (11.0)	330 (10.3)	143 (13.0)	<0.0001
Moderately severe (15-19)	294 (6.8)	336 (7.8)	228 (7.1)	108 (9.8)	
Severe (20-27)	156 (3.6)	214 (5.0)	130 (4.0)	84 (7.6)	
At least 1 sleep difficulty, n (%)	1605 (37.1)	1987 (46.0)	1446 (44.9)	541 (49.1)	<0.0001
Severity of sleep difficulties, n (%)					
No sleep difficulties	2716 (62.9)	2334 (54.0)	1772 (55.1)	562 (51.0)	
Mild	875 (20.3)	1012 (23.4)	777 (24.2)	235 (21.3)	<0.0001
Moderate	566 (13.1)	774 (17.9)	537 (16.7)	237 (21.5)	
Severe	164 (3.8)	201 (4.7)	132 (4.1)	69 (6.3)	
Impact of sleep difficulties, n (%)					
No report of sleep difficulties	2716 (62.9)	2334 (54.0)	1772 (55.1)	562 (51.0)	
None	167 (3.9)	199 (4.6)	139 (4.3)	60 (5.4)	
Little	465 (10.8)	529 (12.2)	386 (12.0)	143 (13.0)	
Mild	510 (11.8)	579 (13.4)	424 (13.2)	155 (14.1)	<0.0001
Moderate	340 (7.9)	493 (11.4)	362 (11.3)	131 (11.9)	
Severe	123 (2.9)	187 (4.3)	135 (4.2)	52 (4.7)	
EQ-5D-5L scores, mean (SD)					
Index	0.83 (0.15)	0.80 (0.15)	0.80 (0.15)	0.77 (0.17)	<0.0001
VAS	74.9 (21.4)	72.2 (21.6)	73.0 (21.2)	70.0 (22.4)	<0.0001

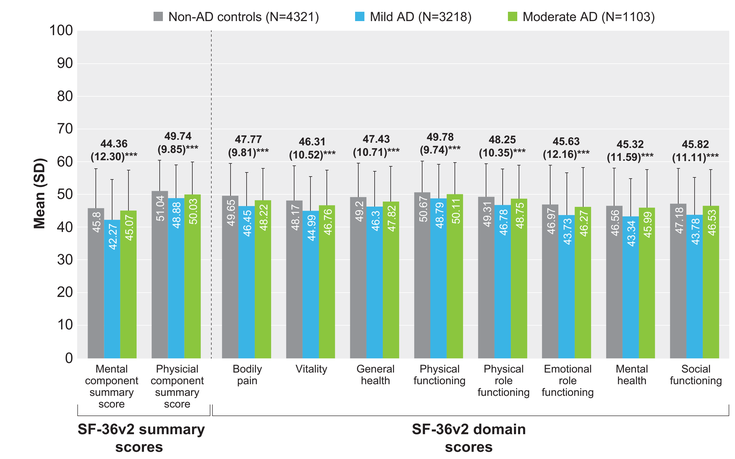
[a]*P* values for mild-to-moderate AD versus non-AD controls.
[b]Assessed via PHQ-9.

Figure 1. Prevalence of Comorbidities



Values above bars are for mild-to-moderate AD (N=4321).
*P<0.05, **P<0.001, ***P<0.0001 for mild-to-moderate AD versus non-AD controls.

Figure 2. SF-36v2 Scores



Values above bars are for mild-to-moderate AD (N=4321).
The 2 summary scores and 8 domain scores of the SF-36v2 each range from 0 to 100, with higher scores indicating better health status.
***P<0.0001 for mild-to-moderate AD versus non-AD controls.

CONCLUSIONS

- **A number of comorbidities were more frequent in US adults with mild-to-moderate AD compared with non-AD controls**
- **US adults with mild-to-moderate AD frequently reported anxiety, depression (including moderate-to-severe depression), and sleep difficulties (including moderate-to-severe sleep impact)**
- **Increased burden in mild-to-moderate AD was also observed for health status and QoL**
- **The results of this real-world survey highlight the importance of improving AD disease management and reducing the clinical, economic, and humanistic impact of related comorbidities in this population**

Abbreviations **AD**, atopic dermatitis; **ADD**, attention deficit disorder; **ADHD**, attention deficit hyperactivity disorder; **BMI**, body mass index; **CHF**, congestive heart failure; **EQ-5D-5L**, EuroQol 5-dimension, 5-level questionnaire; **NHWS**, National Health and Wellness Survey; **PVD**, peripheral vascular disease; **PHQ-9**, Patient Health Questionnaire-9; **QoL**, quality of life; **SF-36v2**, 36-item short-form health survey version 2; **VAS**, visual analog scale.

References **1.** Silverberg JI et al. *J Allergy Clin Immunol*. 2013;132:1132-1138. **2.** Eckert L et al. *J Am Acad Dermatol*. 2017;77:274-279. **3.** Beattie PE et al. *Br J Dermatol*. 2006;155:145e51. **4.** Hay RJ et al. *J Invest Dermatol*. 2014;134:1527-1534.