Greater Severity of Atopic Dermatitis Is Associated with Poorer Patient-Reported Outcomes among Adults with Moderate-to-Severe Atopic Dermatitis

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Background
Atopic dermatitis (AD) is a common chronic inflammatory skin disease that affects many adults.1 AD symptoms include red, itchy, swollen, and weeping skin lesions with crusting and scaling.1 More severe AD is associated with poorer health-related quality of life (HRQoL).2,3 This includes sleep disturbance and reductions in work productivity.4 Prior research indicates that moderate-to-severe AD has a negative impact on patients' HRQoL.3 There has been little work examining the relationship between AD severity and patient-reported HRQoL.4 Previous research has studied American and European populations separately but has not systematically explored how these relationships may differ across varying geographic areas.

Objective
To assess the relationship between severity of AD and patient-reported outcomes among adults with moderate-to-severe AD using multi-country real-world data.

Design / Methods
DATA SOURCE
Web survey by 1,122 participants sourced from the National Health and Wellness Survey (NHWS) in the United States (US) and European Union (EU) countries (France, Germany, and the United Kingdom (UK)). The NHWS is an annually recurring study of the healthcare attitudes and behaviors of nationally representative samples of adults in the respective country.

SAMPLE
Inclusion criteria
- 218 years of age
- Self-reported physician diagnosis of AD, dermatitis, or eczema
- Self-reported having sought treatment from a dermatologist, allergist, or immunologist for their condition

MEASURES
Demographics and Health Characteristics
- Demographics included age, gender, type of community (urban, suburban, rural), marital status, employment status, education, household income, and geographic region
- Health characteristics included: body mass index (BMI); smoking behavior; alcohol use; exercise behavior (whether exercised in past month); Charlson comorbidity index (CCI); and years diagnosed with AD
- AD Severity
- Patients responded to the self-reported, validated Patient-Oriented Score of Atopic Dermatitis (PO-SCORAD) and were then classified as having moderate (scores of 25-50 points) or severe (scores >50 points) AD based on established cutoffs for PO-SCORAD
- The severe AD group was further subdivided into the following categories: Severe 1 (PO-SCORAD 51-60), Severe 2 (PO-SCORAD 61-70), Severe 3 (PO-SCORAD 71-80), Severe 4 (PO-SCORAD >80)
- Patient-Reported Outcomes
- EuroQol 5-Dimen / Dimensional Health Questionnaire (EQ-5D)
- A widely used survey instrument for measuring general HRQoL, e.g., health status; lower scores indicate poorer general HRQoL
- Dermatology Life Quality Index (DLQI)
- A 10-question validated questionnaire which measures dermatology-specific HRQoL; higher scores indicate poorer HRQoL
- Patient-Oriented Eczema Measure (POEM)
- A validated patient-derived assessment measure for monitoring atopic eczema disease activity; higher scores indicate greater disease activity
- Work Productivity and Activity Impairment Questionnaire Specific Health Problem (WPAI-SHP)
- A validated scale measuring lost work productivity (overall work impairment) and impairment in daily activities (activity impairment); higher scores indicate greater impairment

STATISTICAL ANALYSES
Unadjusted Analyses
- Students t-tests were used to compare severity groups (moderate and severe AD as measured by PO-SCORAD scores) on demographics and health characteristics as well as patient-reported outcomes
- Spearman correlations (r) were used to estimate the association between PO-SCORAD scores and outcomes measures

Adjusted Analyses
- Generalized linear models examined associations between the level of AD severity and outcomes, controlling for covariates

RESULTS

Table 1. Sample Demographics and Health Characteristics

<table>
<thead>
<tr>
<th></th>
<th>EU (N=548)</th>
<th>US (N=550)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>45.3 (13.5)</td>
<td>51.3 (15.3)</td>
</tr>
<tr>
<td>Years Since AD Diagnosis</td>
<td>19.42 (14.86)</td>
<td>18.93 (15.10)</td>
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<tr>
<td>Current Employment Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed (%)</td>
<td>70.5 (%)</td>
<td>69.4 (%)</td>
</tr>
<tr>
<td>Unemployed (%)</td>
<td>26.0 (%)</td>
<td>28.0 (%)</td>
</tr>
<tr>
<td>Missing (%)</td>
<td>3.5 (%)</td>
<td>2.6 (%)</td>
</tr>
</tbody>
</table>

Table 2. Patient-Reported Outcomes by PO-SCORAD for EU and US Participants (Unadjusted Analyses)

<table>
<thead>
<tr>
<th></th>
<th>PO-SCORAD (0-28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>EQ-5D Index</td>
<td>0.74 (0.26)</td>
</tr>
<tr>
<td>DLQI Score</td>
<td>14.9 (7.3)</td>
</tr>
<tr>
<td>POEM Score</td>
<td>3.2 (2.1)</td>
</tr>
<tr>
<td>SCORAD Severity</td>
<td>24.76 (24.76)</td>
</tr>
<tr>
<td>Self-Reported Outcomes</td>
<td></td>
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</table>

PATIENT-REPORTED OUTCOMES BY PO-SCORAD (Unadjusted Analyses)
- Relative to moderate AD, those with severe AD had lower EQ-5D index scores, higher DLQI scores, higher POEM scores, and more work and activity impairment in both the EU and US samples (Table 2).
- Differences in EQ-5D, DLQI, and POEM scores between moderate and severe AD exceeded minimally important differences (0.07 and 4.5, respectively).
- The relationship between severity of AD and poorer outcomes was also seen in correlations (all p<0.001) between PO-SCORAD and:
  - EQ-SD index scores (ρ = -0.39, τ = -0.33)
  - DLQI scores (ρ = 0.62, τ = 0.60)
  - POEM scores (ρ = 0.49, τ = 0.61)
  - Impairment to work (r = 0.49, r = 0.44)
  - Activity impairment (ρ = 0.54, τ = 0.52)

PATIENT-REPORTED OUTCOMES BY PO-SCORAD (Adjusted Analyses)
- Consistent with unadjusted results, even after adjusting for covariates, as PO-SCORAD severity increases, differences were observed in EQ-5D index scores (Figure 1) and greater burden observed by DLQI scores (Figure 2), POEM scores (Figure 3), and overall work and activity impairment (Figures 4 and 5).
- This pattern of results was consistent across the EU and US samples.

CONCLUSIONS
- Among patients with moderate-to-severe AD, greater disease severity was associated with poorer HRQoL from a patient’s perspective.
- HRQoL outcomes were worse as AD severity increased.
- The same pattern of results was consistently observed among the EU and US subsamples. Thus, the burden associated with AD severity did not generally differ between geographies.
- Results suggest that reducing severity of AD among moderate-to-severe AD patients is likely to result in significant reduction in the high burden of disease experienced by these individuals.

ACKNOWLEDGMENTS

REFERENCES

Figure 1. Mean EQ-SD Index Score by PO-SCORAD Severity, Adjusted for Covariates

Figure 2. Mean DLQI Score by PO-SCORAD Severity, Adjusted for Covariates

Figure 3. Mean POEM Score by PO-SCORAD Severity, Adjusted for Covariates

Figure 4. Mean Overall Work Impairment by PO-SCORAD Severity, Adjusted for Covariates

Figure 5. Mean Activity Impairment by PO-SCORAD Severity, Adjusted for Covariates

Note: Data from representative survey of the adjusted mean scores; peak of the study population was in the 18-34 range, which may explain the results in terms of age and years diagnosed with AD.