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SUPPORTING INFORMATION

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Prevalence, atopic and psychological comorbidity of physician-diagnosed atopic dermatitis in an adult general population sample: A cross-sectional study

To the Editor,

Data regarding the epidemiology of atopic dermatitis (AD) and associated atopic and psychological comorbidity in adults are limited. Previous population-based studies among European adults revealed AD prevalences ranging from 4.4% to 7.1%.[1] Evidence suggests that AD is associated with a higher risk of other atopic disorders,[2] and indicates that AD is related to depression and suicidal ideation in adult age.[3] Moreover, somatization has been related to skin disorders,[4] but data regarding the association of AD with somatization are rare.

The present study aimed (i) to investigate the prevalence of physician-diagnosed AD by sex and age and (ii) to examine the association of physician-diagnosed AD with (indicators of) atopic and psychological comorbidities in a general population sample of adults. We analyzed data from 3035 participants (aged 20–83 years) from the Study of Health in Pomerania (SHIP)-TREND-0, a population-based project conducted in northeast Germany. The methods are detailed in the Appendix S1. In brief, AD was diagnosed by dermatologists in a standardized clinical examination. Using self-reports, we collected data on the lifetime history of allergy, hay fever, hyposensitization and asthma, and data on psychological comorbidities including depressive symptoms, suicidal tendencies and somatic symptoms.

The overall prevalence of AD was 4.7% (95% CI 3.9–5.5%). Men and women did not differ in AD prevalence (4.2% vs. 5.3%; $p = .696$). The prevalence of AD significantly decreased across age (OR = 0.97; 95% CI 0.96–0.98) (Figure S1). Individuals with AD reported more often a higher level of school education, but a lower household income (Table S1). Multivariable regression analyses revealed positive

associations of AD with allergy, hay fever, hyposensitization and asthma (Table 1). The relationship of AD with depressive symptoms and suicidal tendencies was non-significant, but we found evidence for an association of AD with somatic symptoms (Table 2). Back and lower back pain, neck and shoulder pain and joint pain were the most frequently reported somatic symptoms (Figure S2).

The AD prevalence found in the present study was somewhat lower than the rates reported from other European countries,[1] which might be explained by different measurements of AD and reference periods in previous research. Importantly, the majority of studies is based on self-reports of AD,[1] which have limited validity. Our data contribute to the literature demonstrating that AD is related to multiple atopic comorbidities, but are in contrast to previous findings suggesting an association of AD with depression and suicidality.[3] When interpreting these conflicting results, it must be noted that existing studies in this regard have limited comparability due to differences in study design and measurement of AD, depression and suicidality. Our finding that somatization is an important comorbidity is novel and may be significant for patient care. Somatization is important to consider because somatic symptoms may be one way to communicate psychological distress or mask depression.[5]

The following limitations should be noted. First, one-time skin examination as applied in the present study is likely to exclude mild or transient AD cases,[6] potentially leading to underestimation of the AD prevalence. Second, disease severity might be a moderator of the association between AD and comorbidities, but data regarding AD severity were not available. Third, due to the study design, no causal inference can be drawn.

In summary, the present study is the first to provide data about the prevalence of physician-diagnosed AD in a German adult general population sample. Our data confirm previous findings indicating that AD may be a systemic disease involving numerous allergic, respiratory and psychological comorbidities,[2] and suggest that somatization is an important condition which needs awareness among dermatologists. Future research in longitudinal population-based cohorts with standardized assessments of AD and comorbidities is required.

TABLE 1 Association of atopic dermatitis with (indicators of) atopic comorbidities

	Allergy			Hay fever			Hyposensitization			Asthma		
	OR	95% CI	*p*-value	OR	95% CI	*p*-value	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Adjusted for age and sex	2.96	2.00; 4.37	<.001	3.33	2.20; 5.02	<.001	2.57	1.47; 4.49	.001	2.34	1.23; 4.45	.010
Adjusted for age, sex and school education	2.91	1.96; 4.31	<.001	3.24	2.13; 4.92	<.001	2.47	1.40; 4.36	.002	2.31	1.23; 4.40	.011
Adjusted for age, sex and household income	3.06	2.06; 4.57	<.001	3.51	2.31; 5.35	<.001	2.66	1.50; 4.71	.001	2.36	1.24; 4.51	.009

Note: Results from logistic regression analysis.
Abbreviations: CI, confidence interval; OR, odds ratio.

TABLE 2 Association of atopic dermatitis with psychological comorbidities

	Depressive symptoms[a]			Suicidal tendencies[b]			Somatic symptoms[a]		
	β	95% CI	*p*-value	OR	95% CI	*p*-value	*β*	95% CI	*p*-value
Adjusted for age and sex	0.17	−0.40; 0.72	.562	0.93	0.50; 1.74	.821	1.83	0.17; 3.51	.031
Adjusted for age, sex and school education	0.20	−0.36; 0,75	.489	0.94	0.50; 1.77	.854	2.02	0.37; 3.67	.016
Adjusted for age, sex and household income	0.18	−0.39; 0.74	.544	0.97	0.51; 1.82	.914	1.82	0.13; 3.53	.035

Note: Abbreviations: CI, confidence interval; OR, odds ratio.
[a]Results from linear regression analysis.
[b]Results from logistic regression analysis.

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CONFLICT OF INTEREST

Dr. Piontek, Dr. Ittermann, Dr. Arnold, Prof. Völzke and Prof. Baumeister have nothing to disclose. Prof. Apfelbacher reported consulting fees from Dr Wolff Group, Sanofi Genzyme, LEO Pharma; payment or honoraria for lectures, etc. from AstraZeneca; support for attending meetings and/or travel from Dr Wolff Group; and participation on a Data Safety Monitoring Board or Advisory Board in Dr Wolff Group. Prof. Apfelbacher is co-chair of the Harmonising Outcome Measures for Eczema (HOME) initiative.

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SUPPORTING INFORMATION

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In vitro safety and anti-bacterial efficacy assessment of acriflavine

To the Editor,

Chronic rhinosinusitis (CRS) is a complex sinus disease defined as inflammation of the nasal mucosa and paranasal sinuses.[1] It has been shown that the bacterial biofilm formation is one of the major factors involved in recalcitrant CRS.[2] The most frequently isolated biofilm-forming species in patients with CRS are *Staphylococcus*

Please contact Shari Javadiyan if further documents/editing is required.

Shari Javadiyan and Kitty C. Germein Equal contributions.