Atopic dermatitis predisposes adolescents to high risk of psychiatric comorbidities

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Introduction

Atopic dermatitis (AD) is a common disease affecting both young and adult patients.

The disease due to its clinical manifestation, chronic and recurrent course and severe itch significantly affects patients' mental health.

However, comprehensive estimates of the psychiatric effects of AD among adolescents remain limited.

Objectives

This study aims to quantify the risk and cumulative burden of a wide range of psychiatric disorders in adolescent patients with atopic dermatitis compared to propensity-matched controls.

Material and Methods

This retrospective cohort study was conducted using data from the TriNetX Analytics platform, a global federated health research network that aggregates de-identified electronic health records (EHRs) from over 65 healthcare organizations across mainly the United States.

The database comprises real-time clinical data from both inpatient and outpatient settings, including demographics, diagnoses, procedures, medication prescriptions, and healthcare utilization, allowing for robust longitudinal analyses across diverse patient populations.

Material and Methods

The study population consisted of adolescents aged 10 to 18 years who were diagnosed with atopic dermatitis (AD) for the first time between 2015 and 2025.

AD was identified using the ICD-10-CM code L20.

To minimize confounding by prior mental illness, individuals with any recorded psychiatric diagnosis before the date of AD diagnosis were excluded.

Psychiatric conditions were defined broadly using ICD-10-CM codes F01 through F99.

The date of initial AD diagnosis was designated as the index date.

A comparator group was created by selecting adolescents who had attended a general preventive health examination, defined by ICD-10-CM code Z00, and who had no documented diagnosis of AD or any psychiatric disorder prior to the index event.

To reduce confounding, we conducted 1:1 propensity score matching (PSM) between AD and non-AD cases using logistic regression to generate propensity scores.

Material and Methods

All individuals were followed longitudinally for up to five years from their respective index dates.

Psychiatric outcomes were classified as incident if they occurred for the first time during the five-year follow-up period, and as prevalent if they were present either before or during that time.

The primary outcomes were incident psychiatric disorders, identified by new entries in the EHR using ICD-10-CM codes corresponding to:

- depressive disorders (F32, F33, F34.1),
- anxiety and stress-related disorders (F40, F41, F43),
- sleep disorders (G47, F51),
- eating disorders (F50),
- self-harm (X71–X83, R45.88),
- suicidal ideation or attempts (R45.851, Z91.51, T14.91),
- substance use disorders (F10–F19),
- bipolar/mania (F30, F31),
- psychotic disorders (F20–F29),
- personality disorders (F60–F69),
- somatoform disorders (F45),
- severe psychiatric illnesses (schizophrenia and bipolar; F20–F29, F30, F31).

Statistical analysis

Differences between groups were tested using Student's t-test or Wilcoxon rank-sum test for continuous variables, and $\chi 2$ or Fisher's exact test for categorical variables.

The quality of propensity score matching was assessed by comparing standardized mean differences (SMDs) of all covariates before and after matching, with an SMD less than 0.1 indicating good balance

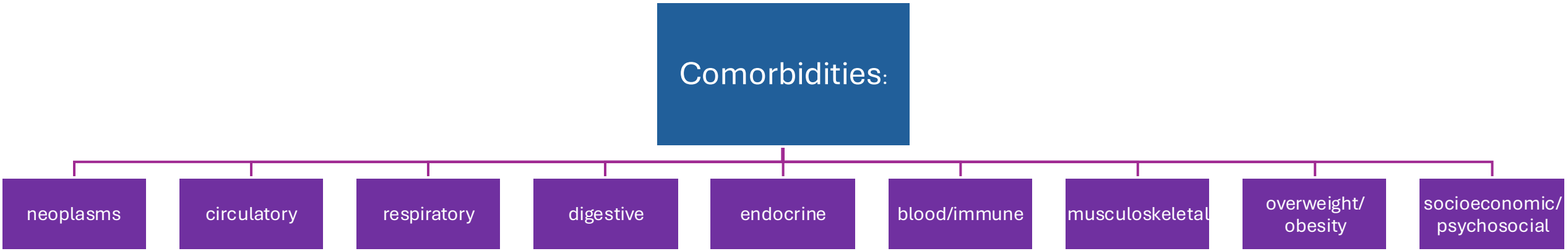
To assess the association between AD and the risk of developing psychiatric disorders, we employed Cox proportional hazards regression models to calculate hazard ratios (HRs) for time-to-event outcomes.

Analyses followed a two-sided significance level ($p < 0.05$).

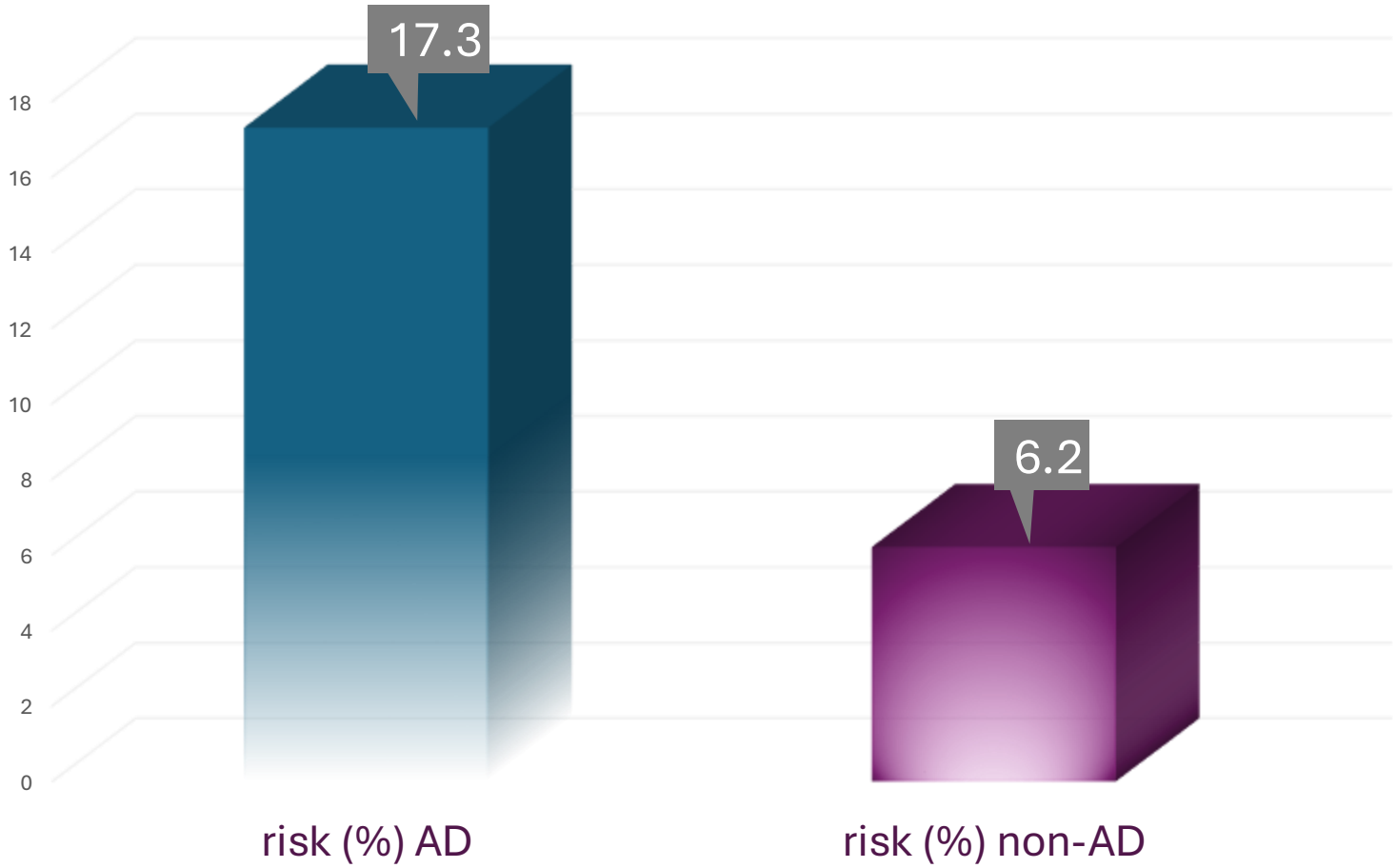
Results

In the initial analysis, 263,469 adolescent patients with AD and 1,457,176 non-AD controls were retrieved.

Following PSM, each group comprised 262,558 EHRs with nearly identical distributions for age, sex, and major comorbidities



Results: Any Psychiatric Comorbidity



HR(95%CI)

- 3.0 (2.95 – 3.06)

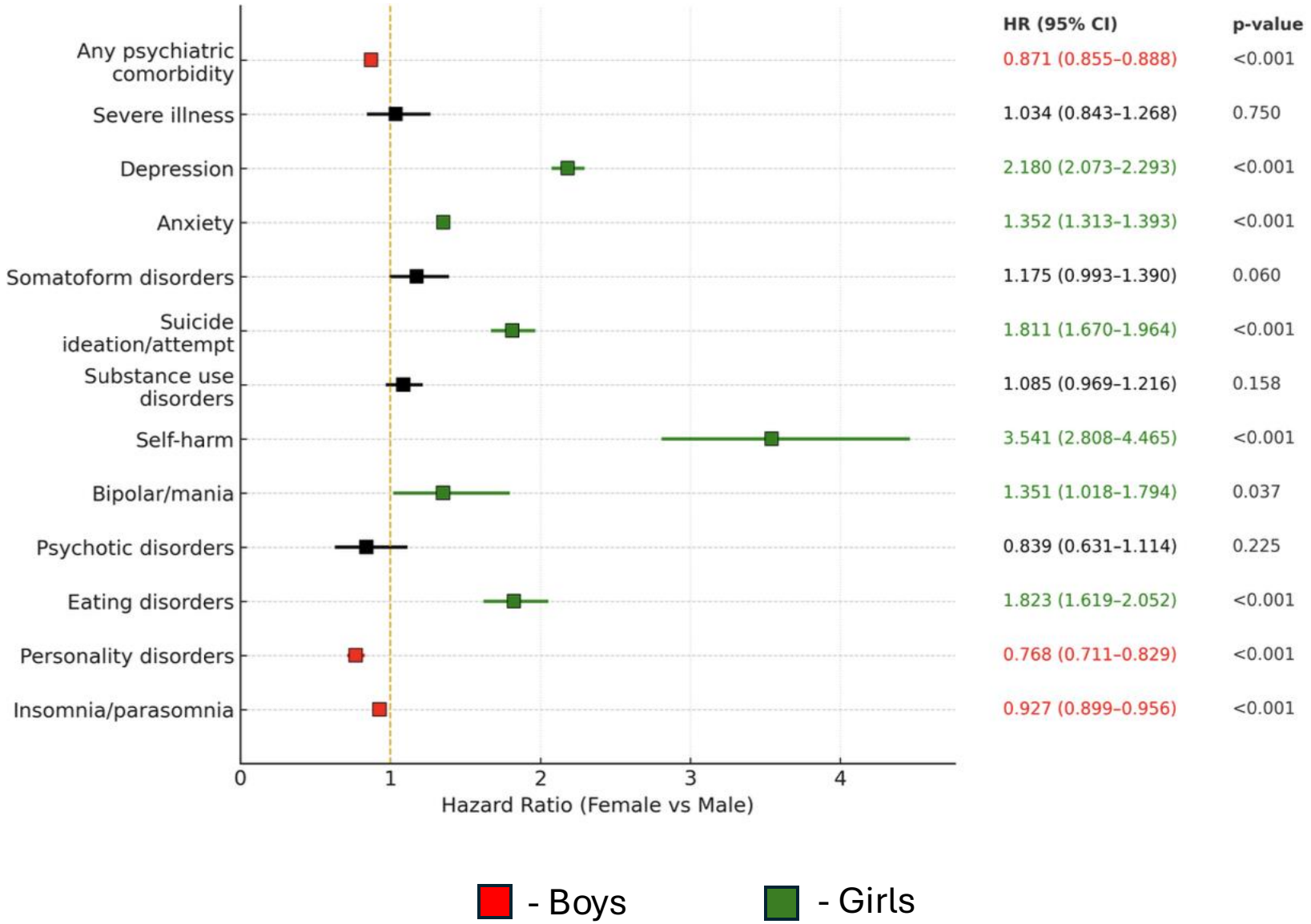
p-value (HR)

- <0.001

Results: psychiatric comorbidities

Outcome	risk (%) AD	risk (%) non-AD	HR (95% CI)	p-value (HR)
Severe psychiatric illness	0.2	0.1	2.03 (1.70–2.41)	< 0.001
Depression	2.9	1.1	2.66 (2.54–2.78)	< 0.001
Anxiety	7.7	2.8	2.72 (2.65–2.83)	< 0.001
Somatoform disorders	0.2	0.1	2.92 (2.47–3.44)	< 0.001
Suicide (ideation/attempt)	1.1	0.6	1.62 (1.53–1.73)	< 0.001
Substance use	0.5	0.3	1.70 (1.55–1.86)	< 0.001
Self-harm	0.2	0.1	1.47 (1.26–1.71)	< 0.001
Bipolar/mania	0.083	0.044	1.75 (1.39–2.19)	< 0.001
Psychotic disorder	0.076	0.032	2.19 (1.70–2.83)	< 0.001
Eating disorder	0.5	0.2	2.59 (2.34–2.88)	< 0.001
Personality disorder	1.0	0.2	4.31 (3.93–4.72)	< 0.001
Insomnia/parasomnia	6.9	4.6	1.49 (1.45–1.52)	< 0.001

Results: Girls versus Boys



Conclusions

Atopic dermatitis among adolescents is associated with an approximately 300% higher risk of developing any psychiatric conditions.

Sex-stratified analysis revealed significant differences in psychiatric burden between male and female adolescents with atopic dermatitis.

Routine mental health screenings and integrated care involving dermatology and psychiatry should be standard components of adolescent atopic dermatitis management.