The atopic triad is associated with increased Atopic Dermatitis-related healthcare utilization and expenditures in pediatric patients: results from the Medical Expenditure Panel from 1996-2015

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Background

Atopic dermatitis (AD) is an intensely pruritic inflammatory skin condition associated with significant morbidity and a dramatic reduction in quality of life. Subsets of patients with atopic dermatitis also have the atopic triad – indicating a higher rate of comorbid atopic disease, including allergic rhinitis and asthma. Although emerging evidence suggests that AD is a systemic disease, limited data are available on varying patient demographics and the impact on healthcare utilization, among pediatric patients who have AD alone compared to individuals with the atopic triad. We hypothesized individuals with the atopic triad have greater healthcare utilization reflecting higher AD severity.

Objective

To characterize the pediatric population with AD alone and with the atopic triad, and to determine the impact of the atopic triad on AD-related healthcare utilization and expenditures in in this population.

Methods

The Medical Expenditure Panel (MEPS) from 1996 to 2015 was used to determine healthcare utilization and expenditures associated with AD. Survey respondents with AD, allergic rhinitis, and asthma were selected using corresponding International Classification of Diseases, Ninth Revision codes and limited to the pediatric population (age < 18). Respondents were grouped into two categories: those with AD alone, and those with AD, allergic rhinitis, and asthma (i.e. atopic triad). Healthcare utilization was measured by number of AD-related ambulatory visits and prescriptions, and expenditure was measured by costs for AD-related ambulatory visits and prescriptions.

Baseline demographics were compared with Student's t-test for continuous variables and χ^2 for categorical variables. Mean annual healthcare utilization and expenditures were compared using Student's t-test. Multivariable linear regression models adjusting for age, race, sex, and insurance coverage (covariates) were used to determine the relationship of the atopic triad (independent variable) with number AD-related ambulatory visits, prescriptions, and their associated costs (dependent variables). Excess utilization and expenditures attributable to the atopic triad were calculated using β coefficients and national estimates of total patients. All analyses were performed taking into account the MEPS complex survey design and population weights.

Results

From 1996 to 2015, the MEPS captured an estimated 29,471,338 pediatric patients with AD alone and 1,897,580 with the atopic triad. Patients with the atopic triad were more likely to be male (56.38% vs. 50.14%, P=0.005) and black (21.94% vs. 16.21%, P<0.001) than those with AD alone. Patients with the atopic triad had a higher mean annual number of AD-related ambulatory visits (1.09 vs 0.74, P<0.001) and AD- related prescriptions (1.68 vs 1.00, P<0.001), than those with AD alone. Patients with the atopic triad also had a higher mean annual expenditure ($352.22 vs. $80.11, P<0.001) for AD-related prescriptions than those with AD alone. Using multivariable linear regression adjusting for age, race, sex, and insurance coverage, presence of the atopic triad positively correlated with number of AD-related prescriptions (β 0.656, 95% CI: 0.201 – 1.111, P=0.005), and AD-related expenditure for prescriptions (β $264.64 , 95% CI: $67.79 – $461.49, P=0.009). Compared to AD alone, the atopic triad contributed an annual excess of 62,241 AD-related prescriptions and $25,108,778.60 in expenditure for AD-related prescriptions.

Limitations:

The cross-sectional design of the MEPS precludes conclusions about any temporal relationships. Analysis for emergency and inpatient utilization was not possible due to a limited sample size in these categories.

Conclusion

We found that pediatric patients with the atopic triad were more likely to be male and black than those with AD alone. We also found that the presence of the atopic triad contributed to increased AD-related healthcare utilization and expenditure among pediatric patients. These findings may reflect an increased severity of AD in those with comorbid atopic disease and underscore the systemic nature of AD. Therefore, clinicians must be aware of these associations, as optimal management of AD may also require adequate control of comorbid allergic rhinitis and asthma.