

Burden and risk of asthma and rhinitis in people with atopic dermatitis: global estimates from a hierarchical Bayesian model

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Abstract

Background

Atopic dermatitis (AD) is a chronic inflammatory skin disease often associated with asthma and rhinitis. However, epidemiological evidence on these comorbidities remains fragmented and is largely limited to high-income countries.

Objectives

To provide comprehensive global, regional and country-level estimates of the prevalence and odds ratios (ORs) of asthma, rhinitis and their subtypes among individuals with AD.

Methods

We systematically reviewed 278 studies retrieved from PubMed, Embase, Web of Science and CNKI (China National Knowledge Infrastructure). Standardized prevalence estimates and ORs were derived using a Bayesian hierarchical linear mixed-effects model.

Results

Among individuals with AD, the global prevalence estimate of asthma, rhinitis, allergic rhinitis, rhinoconjunctivitis, and coexisting asthma and rhinitis was 20.1% (ranging from 2.5% in Israel to 59.4% in India), 45.1% (ranging from 7.8% in Israel to 82.7% in India), 41.4% (ranging from 6.8% in Israel to 80.3% in



India), 30.7% (ranging from 4.3% in Israel to 71.9% in India) and 10.4% (ranging from 1.1% in Israel to 40.8% in India), respectively. Estimates were higher when restricted to patients with AD diagnosed by dermatologists or physicians. The highest comorbid prevalence rates were found for India, Cuba, Finland and Puerto Rico. Compared with healthy control individuals, AD was associated with higher odds of asthma (OR 2.73; ranging from 1.59 in China to 6.64 in Ethiopia), rhinitis (OR 2.98; ranging from 1.73 in China to 7.23 in Ethiopia), allergic rhinitis (OR 2.42; ranging from 1.41 in China to 5.89 in Ethiopia), rhinoconjunctivitis (OR 4.21; ranging from 2.45 in China to 10.19 in Ethiopia), and coexisting asthma and rhinitis (OR 2.42; ranging from 1.41 in China to 5.89 in Ethiopia).

Conclusions

This study provides the first globally standardized estimates of respiratory comorbidities in AD, and can inform clinical practice and public health policy.

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Lay Summary

Atopic dermatitis is a common long-term inflammatory skin disease. It is also called eczema. It affects more than 200 million children and adults worldwide. People with the disease often have other conditions, particularly asthma and rhinitis. Asthma affects breathing and rhinitis causes sneezing or congestion. Most studies on these conditions have been in wealthy countries. They have also used a range of different research methods. This makes it difficult to compare and understand the global situation.

In this study, researchers in China and the USA analysed data from 278 studies from around the world. We estimated how common asthma and rhinitis are in people with eczema in different regions and countries. We found that about 1 in 5 people with eczema have asthma and almost half have rhinitis. We also found that

people with eczema are 2 to 4 times more likely to have these conditions than people without eczema. Some countries showed particularly high rates of these conditions.

Our findings suggest that asthma and rhinitis are common problems for people with eczema. This is true no matter where they live. The information from this study may help doctors recognize and manage these conditions in people with eczema. These findings could also support future research to improve disease prevention and patient care.

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