



Cystic Fibrosis Research News

Title:

Risk of asthma in heterozygous carriers for cystic fibrosis: a meta-analysis

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What was your research question?

People with cystic fibrosis (CF) carry two copies of the faulty 'CFTR' gene. Our research question was: Do people who do not have CF but carry one copy of the faulty gene ('heterozygous carriers of CF') have a higher risk of asthma than non-carriers?

Why is this important?

In people with CF, symptoms characteristic of asthma (e.g. wheezing, shortness of breath) may be entirely due to CF lung disease; however, some people with CF also have asthma (also called CF asthma) that can contribute to their symptoms. The increased risk of CF asthma in people with CF has been known for a long time (approximately 19% of people with CF have been diagnosed with CF asthma). However, it is currently unclear whether heterozygous carriers of CF are more susceptible to asthma than non-carriers. About 1 in 30 Caucasian and 1 in 90 Asian people carry one copy of the faulty CFTR gene. Therefore, it is important to determine if these people with one faulty copy of the CFTR gene have an increased risk of asthma.

What did you do?

We performed a research method known as a meta-analysis. We searched the literature in online databases from 1966 to 2015 for all research articles that investigated the risk of asthma in heterozygous carriers of CF, and we subsequently combined the results of the most appropriate studies. We then used complex mathematical approaches to answer our research question. Our meta-analysis combined the results from 15 articles comprising 2,113 people with asthma and 13,457 people without asthma.

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What did you find?

The meta-analysis showed that the risk of asthma was much higher in heterozygous carriers of CF than in non-carriers. A subgroup analysis based on ethnicity showed that the risk of asthma in heterozygous carriers of CF was even higher in Asian populations compared to Caucasian populations.

What does this mean and reasons for caution?

It can be estimated that heterozygous carriers of CF may account for up to 1.9% of asthma cases in Asian populations and 1.6% of asthma cases in Caucasians. These results indicate that having one copy of the faulty CFTR gene contributes to a number of asthma cases in Asian and Caucasian populations. However, we cannot be certain that the results of the meta-analysis show the true extent of the risk of asthma among heterozygous carriers of CF.

What's next?

Asian heterozygous carriers of CF are more susceptible to asthma than Caucasian heterozygous carriers of CF suggesting that environmental factors related to Asian areas may also affect the risk of asthma in this group. To determine if this is the case future large studies of Asian and Caucasian people are required.

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