

Asthma in preschool children: prevalence and risk factors

Thorax 2001;56:589-595 (August)

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FROM ABSTRACT

BACKGROUND

The prevalence of asthma in children has increased in many countries over recent years.

To plan effective interventions to reverse this trend we need a better understanding of the risk factors for asthma in early life.

This study was undertaken to measure the prevalence of, and risk factors for, asthma in preschool children.

METHODS

Parents of children aged 3-5 years living in two cities (Lismore, n=383; Wagga Wagga, n=591) in New South Wales, Australia were surveyed by questionnaire to ascertain the presence of asthma and various proposed risk factors for asthma in their children.

Recent asthma was defined as ever having been diagnosed with asthma and having cough or wheeze in the last 12 months and having used an asthma medication in the last 12 months.

Atopy was measured by skin prick tests to six common allergens.

RESULTS

The prevalence of recent asthma was 22% in Lismore and 18% in Wagga Wagga.

Factors, which increased the risk of recent asthma, were:

- (1) Atopy
- (2) Having a parent with a history of asthma
- (3) Having had a serious respiratory infection in the first 2 years of life
- (4) A high dietary intake of polyunsaturated fats [omega-6]

Breast feeding and having three or more older siblings decreased the risk of recent asthma.

CONCLUSIONS

Of the factors tested, those that have the greatest potential to be modified to reduce the risk of asthma are breast-feeding and consumption of polyunsaturated fats.

THESE AUTHORS ALSO NOTE:

“Asthma is a major public health problem in developed countries, especially in children.”

“Ultimately we want to prevent asthma, not just to relieve its symptoms.”

“However, the causes of asthma and the reasons for its increasing prevalence in the past few decades are not known.”

“Polyunsaturated fat intake was defined as high if children usually had polyunsaturated fats on bread or toast and parents usually used polyunsaturated fats when roasting or frying their child's food.”

Polyunsaturated fat intake was defined as low if mono-unsaturated or saturated fats were usually consumed.

“Atopy was measured by skin prick test reactions to six allergens applied to the forearm.”

RESULTS

974 children participated in this study.

“The attributable fractions for a high dietary intake of polyunsaturated fats and not having been breast fed were 0.17 and 0.16, respectively. Thus, 17% of the cases of recent asthma in this population can be attributed to a high dietary intake of polyunsaturated fats and 16% to not breast feeding.”

Children who had ever been breast fed, even for 3 months or less, had a reduced risk of having asthma compared with children who had never been breast fed.

DISCUSSION

The prevalence of asthma in these preschool children averaged 20%.

“If all children with recent symptoms were classified as having asthma, the prevalence of asthma would have been 30-40%.”

The prevalence of use of an asthma medication in the previous 12 months was high, at 25-30%.

“Atopy, having a parent with a history of asthma, having had a serious respiratory infection in the first 2 years of life, and a high dietary intake of polyunsaturated fats were significant risk factors for asthma in this population of preschool age children.”

“Breast feeding and having three or more older siblings were both protective factors for asthma.”

“Of these, the factors that have the greatest potential to be modified to prevent asthma are breast feeding and consumption of fats.”

“A high level of polyunsaturated fats, defined as the use of polyunsaturated fats on bread and in cooking, was associated with an increased risk of recent asthma and could account for up to 17% of cases in this population.”

“A possible explanation for this finding is that an increased consumption of polyunsaturated fats leads to an increased ratio of omega-6 to omega-3 fatty acids consumed in the diet.”

“It has been hypothesised that the increased consumption of polyunsaturated fats seen in Australia in recent years following campaigns to reduce heart disease could be partly responsible for the increasing prevalence of asthma.”

“Polyunsaturated fats are a rich source of omega-6 fatty acids, such as linoleic acid, which can increase the synthesis of prostaglandin E2.”

“The net effect is to increase the risk of inflammation, which may increase the risk of asthma.”

“Omega-3 fatty acids have the opposite effect by inhibiting the formation of prostaglandin E2 and protecting against inflammation.”

“Thus, reduced consumption of omega-3 fatty acids may also increase the risk of asthma due to a loss of protection against inflammation.”

“Certainly, the evidence for an effect of fatty acids on asthma is increasing and, if the relationship is found to be causal, there is potential to modify fatty acid consumption patterns to reduce the incidence of asthma.”

“In this study, having at least three older siblings considerably reduced the risk of recent asthma.”

“The suggested explanation for this association is that the greater the number of older siblings, the greater the exposure to infections in early life which may protect against asthma and other allergic diseases.”

The authors also “found that serious respiratory infections significantly increased the risk of recent asthma.”

“The explanation for these conflicting findings could be that the relationship of infections with asthma is dependent upon the timing, type, and/or severity of the infections.”

It has been suggested that exposure to infections in the first weeks of life may protect against asthma.

“Breast feeding reduced the risk of recent asthma, which is consistent with findings in other studies that have examined this relationship.”

The authors “did not find that the duration of breast feeding was related to the risk of asthma.”

“Together, this evidence suggests that breast feeding in the first days or weeks of life is most important in terms of reducing the risk of asthma, and not breast feeding could account for up to 16% of cases in this population.”

“Children who were atopic were 2.5 times more likely to have recent asthma than those who were not atopic, after controlling for other significant risk factors.”

“The findings from this study have extended our knowledge of the early life determinants of asthma.”

“We found that the consumption of fatty acids and the number of older siblings do have a significant association with recent asthma, and that breast feeding is associated with a decreased risk of asthma.”

KEY POINTS SUMMARY FROM DAN MURPHY

- (1) Childhood asthma is a major public health problem in developed countries.
- (2) It is better to prevent asthma than to just relieve its symptoms.
- (3) There are genetic risk factors for a child being asthmatic.
- (4) The best efforts made to reduce the incidence of asthma would ideally occur early in life, within the first few weeks or first few months of life.
- (5) Breast feeding early in life was significantly associated with reduced rates of asthma.
- (6) The primary identifiable cause of asthma in this study was a high intake of omega-6 polyunsaturated fats.
- (7) An increased ratio of omega-6 to omega-3 fatty acids in the diet causes asthma.
- (8) Omega-6 fatty acids, such as linoleic acid, are pro-inflammatory, and increase the synthesis of prostaglandin E2.
- (9) Omega-3 fatty acids inhibit the formation of prostaglandin E2 and are anti-inflammatory.
- (10) A greater number of infections in early life may protect against asthma and other allergic diseases. [Hygiene Hypothesis]