

Breastfeeding and the risk of asthma: Current Opinion

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Abstract

Importance of breastfeeding in childhood asthma is a controversial issue. Although most studies have shown a protective effect, some have found an increased rate of asthma in breastfed infants. The present article reviews the status of breastfeeding in protection against asthma. A meta-analysis of the studies showed a protective effect of breast feeding with respect to diagnosed asthma and recurrent wheeze among children with an atopic predisposition (OR 0.52, 95% CI 0.35-0.79). In contrast to the above, other studies found an excess risk of asthma after the age of 6 years with exclusive breastfeeding lasting for 4 months or more in the children who were atopic and whose mother had asthma. Recently North Carolina Child Health Assessment and Monitoring Program (CHAMP), in a follow up survey, showed a dose-response relationship between length of time of breastfeeding and subsequent reduction in the prevalence of childhood asthma and also found a significantly lower prevalence of asthma in breast fed group. We conclude that promotion of exclusive breastfeeding for at least 4 months seems reasonable and the new mothers should be encouraged to breast feed as long as possible.

Key words: Asthma, Breast feeding, Risk

INTRODUCTION

Asthma is a common, chronic illness, which afflicts people of all ages and represents a substantial burden on affected individuals, families and society. Broadly, there are three strategies that can be adopted to reduce this burden, 1) prevent the onset of the disease, 2) try to cure the disease, or control symptoms and, 3) prevent attacks in those who cannot be prevented or cured. The first of these is most desirable, if it is feasible. Substantial variation in prevalence between

countries' and over time^{1,2} implies that changing environmental factors do contribute to the etiology of this disease and, hence, it may be preventable. Many risk factors of asthma have been proposed including age, gender (male), parental smoking, and family history of asthma³. Existing information about the environmental factors leading to asthma may be summarized in terms of four hypotheses: allergen, diet, hygiene and irritants/viral. Low birth weight has also been implicated as one of the strongest independent risk factor for childhood asthma.⁴ A recent study reported that low birth weight (using the standard definition) children were twice as likely as normal weight children to have an asthma diagnosis⁵. In order to make recommendations for the prevention of asthma, we are looking for interventions that are:

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(1) simple, cheap and unlikely to cause harm; (2) have ancillary benefits; and (3) have most evidence to support the effectiveness in preventing asthma. Unfortunately, there are no interventions that definitely meet all these criteria, although avoidance of smoking during pregnancy definitely meets the first two criteria and meets the third criteria in relation to early childhood wheezing illness. The role of exclusive breastfeeding in protecting against asthma is controversial. Although most studies have shown a protective effect, several have found an increased rate of asthma in breastfed infants. The aim of the present article is to analyze the current status of breast feeding in protection against asthma.

LITERATURE REVIEW AND CURRENT EVIDENCE

In 1936, Grulee and Sanford⁶ first reported that breastfeeding protects against infantile eczema. Since then, many studies have appeared on the role of breastfeeding in the prevention of childhood allergic diseases. A meta-analysis of prospective studies examining the relation between breastfeeding and asthma⁷, reviewed the literature up to 1999. Among the 41 studies reviewed, 12 comprised more than 8000 children whose average age was 4.1 years. Overall, breastfeeding had a protective effect with respect to diagnosed asthma and recurrent wheeze among children with an atopic predisposition (OR 0.52, 95% CI 0.35-0.79). Of interest, the benefit was less pronounced in studies where participants were followed past the age of 2 years. Since the end of 1999, several other studies have examined this association among children <6 years of age at follow-up, using prospective⁸ or cross-sectional⁸ designs⁹⁻¹¹. The results are quite similar to those reported in the meta-analysis, breastfeeding appears to be protective against wheezing syndromes early in life in similar populations.

Two recent prospective cohort studies have evaluated the association of breastfeeding with the presence of asthma after the age of 6 years. Wright and colleagues¹², reporting on the Tucson Childhood Respiratory Study, found an excess risk of asthma after the age of 6 years with exclusive breastfeeding lasting for 4 months or more. The effect (OR 8.7, 95% CI 3.4-22.2) was confined to those who were

atopic (positive skin-prick test) and whose mother had asthma. Of note, breastfeeding was protective against wheezing that occurred before the age of 2 years. Sears and colleagues¹³ reported on a birth cohort of over 1000 children assessed repeatedly between the age of 9 and 26 years. Breastfeeding for 4 weeks or longer was associated with an increased risk of both atopy measured by positive skin-prick test (OR 1.91, 95% CI 1.42-2.58) and asthma (OR 2.33, 95% CI 1.46-3.72) anytime between the age of 9 and 21 years. These 2 studies employed more stringent criteria for the diagnosis of asthma than the other studies reviewed.

In support of the findings of these 2 prospective studies, Takemura and colleagues,¹⁴ in a large cross-sectional study of more than 25,000 schoolchildren, aged 6-15 years, found a small excess of asthma among those who were breastfed for 3 months or more (OR 1.2, 95% CI 1.05-1.36). The size of the effect in this study was likely underestimated by including in the comparison group those with some features suggesting asthma and by mis-classifying infant feeding habits. Infante-Rivard¹⁵ first reported a protective effect of breastfeeding against wheezing that required a visit to the emergency department at the age 3 or 4 years. On follow-up of these cases up to 6 years later, breastfeeding was not associated with risk of wheezing that persisted beyond the age of 4 years¹⁶. Two further cross-sectional studies using the ISAAC protocol found either a trend towards a protective effect of breastfeeding against wheeze among children aged 5-8 years¹⁷ or the risk of wheezing associated with lack of breastfeeding apparent among children aged 7-14 who did not report asthma in the family.¹⁸

The study that is in most apparent disagreement with the cohort studies of Wright and colleagues¹² (Arizona) and Sears and colleagues¹³ (New Zealand) is that of Oddy and associates from Australia.^{19,20} In the first report¹⁸ of their prospective cohort study, which was included in Gdalevich and coworkers⁷ meta-analysis,⁷ the introduction of milk, other than breast milk, before the age of 4 months was associated with an increase in the cumulative incidence of wheeze and doctor-diagnosed asthma to the age of 6 years, as well as wheeze in the year before the sixth birthday.

The introduction of cow's milk earlier than 4 months increased the risk of asthma by 25% (OR 1.25, 95% CI 1.02-1.52). Therefore, exclusive breastfeeding was again clearly protective of early wheezing syndromes, but also of wheezing between the ages of 5 and 6. In a follow-up report²⁰ and in contrast to the findings of Wright and colleagues, the authors observed that the association was not dependent on the presence of asthma in the mother. Further clarification of whether the results of this large (n = 2187) Australian study clearly differ will have to wait for a report of a more prolonged follow-up to allow direct comparison with other prospective studies.

North Carolina Child Health Assessment and Monitoring Program (CHAMP)⁵, a follow up survey, was done to test the assumption of a dose-response relationship between breastfeeding duration and childhood asthma (ever-diagnosed) among children aged 2 to 12. Breastfeeding duration is broken into five time periods, ranging from no breastfeeding days to breastfeeding for one year or more. Among the breastfeeding groups, the prevalence of childhood asthma ranged from a high of 20.6 percent compared to never-breastfed group to a low of 8.8 percent⁵. They found evidence of a dose-response relationship between length of time of breastfeeding and subsequent reduction in the prevalence of a child ever having asthma. Several studies have reported that a significant reduction in the risk of childhood asthma has been associated with at least 3-4 months of exclusive breastfeeding^{21,22}. One such study included a prospective birth cohort study of 4,089 children followed through age 4. The authors found that exclusive breastfeeding for 4 months or more reduced the risk of asthma²³ at age 4. But the above stated fact appears to be opposed by two studies. One, A large study (N=6,783) of child participants in NHANES III (National Health and Nutrition Examination Survey, 1988-94), found that breastfeeding, and the duration of breastfeeding, did not appear to "prevent childhood asthma, delay its onset, or reduce its severity"²⁴ and the other, a large cohort study (N=7,223) conducted in Australia found that breastfeeding (≥ 4 months) neither helped nor hindered the onset of asthma among 14-year-old children.²⁵

CURRENT OPINION

In conclusion, the validity of initially established hypothesis that breast feeding protects against asthma seemed to be questioned by some recent studies but this contradiction is limited just to the sphere of allergic asthma. Also it is important to note that a larger body of studies that followed, not only fortified the initial hypothesis but also uncovered a strong inverse relationship between the length of period of breast feeding and incidence of asthma. Based on the above analysis, we would like to suggest the following recommendations:

1. Breast feeding can protect against early wheezing syndromes.
2. Promotion of exclusive breastfeeding for at least 4 months seems reasonable.
3. New mothers should be encouraged to breast feed as long as possible.

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