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Is Exclusive Breastfeeding a Protective Factor for Childhood Asthma and Eczema?

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ABSTRACT

Background: There is much controversy on the benefits and disadvantages of breastfeeding, yet research is progressing to provide clarity on these inconsistencies. Evidence from research is still unclear as to whether breastfeeding will benefit childhood asthma and/or eczema by lowering the risks of it in babies, which could also lead to a positive outcome as they age, compared to different milk formulas. **Objective:** The aim of this literature review is to investigate if exclusive breastfeeding for at least three months is protective against childhood asthma and/or eczema in children ages 0 to 18 years, when compared to those who were not exclusively breastfed for at least three months. **Methods:** A structured literature review was conducted on published studies using the terms "breastfeeding" AND "asthma and Eczema", "exclusive breastfeeding" AND "asthma and Eczema" in uOttawa Search+, PubMed, and Scholar's Portal. Search results were refined according to inclusion and exclusion criteria. These refined results yielded 9 relevant articles for further examination. **Results:** The research strategy allowed for 9 articles to be included for review, with various study designs. In general, the results were too varied for a consensus to be made. 3 studies showed a negative association and 3 showed positive for the eczema outcome, 4 showed a positive association for asthma and 3 showed no effect on either. **Conclusion:** Variations and incongruences in the research make it difficult to conclude for certain a significant association. More research needs to be performed in order to establish a well-defined relationship generalizable to a local population.

Introduction

During recent decades, there has been a dramatic rise in prevalence of allergic diseases, with asthma and eczema being among the 3 most prevalent ones worldwide^{1,2}. Asthma is a lung disease that affects all ages, usually starting during childhood. Over 300 million people¹ worldwide suffer from asthma, and about 600,000 suffering are children under 12³. Eczema is a skin condition that usually affects children before 6 months of age and persists through adulthood⁴. It affects more than 2 million people in Canada among whom 10-15% of them are children⁵. Breastmilk has been commonly associated with allergy prevention (among other things) because of its immunological components that support and facilitate infant growth and development¹. Exclusive breastfeeding is the feeding of an infant with only breast milk for the first 6 months of their life, which is needed for the child to achieve optimal growth, development and health⁶. Controversy has sparked over breastfeeding versus formula-feeding. Research has been conducted on the subject and the results are non-definitive. However, in recent years, the advantages to breastfeeding seem outweigh the disadvantages. There is also controversy over the importance of exclusive breastfeeding, attracting a lot of attention in the health research.

Question

Is exclusive breastfeeding for at least four months protective against childhood asthma and eczema in children ages 0 to 18 years, when compared to those who were not exclusively breastfed for at least four months?

Methods

A structured review was conducted individually by the 3 authors, with the selection of a general topic (i.e., breastfeeding and allergies), on uOttawa Search+, PubMed, and Scholar's Portal. Inclusion and exclusion criteria were applied.

- Applied search terms "breastfeeding" AND "asthma and eczema", "exclusive breastfeeding" AND "asthma and Eczema"
- Applied inclusion criteria: peer-reviewed, human subjects, English, asthma and/or eczema, published between 2000-2017, journal articles, child* from birth to 18 years, full text, online only
- Applied exclusion criteria: general allergy, non English language, animal studies
- Applied manual exclusion criteria: duplicates, review articles, general allergy, full text unavailable free or via uOttawa database, broken links
- Title and abstract screening; relevant to breastfeeding and asthma and/or eczema based on title and abstract

Fig.1: overview of literature search with inclusion and exclusion criteria on the left and number of articles listed on the right

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Results

Table 1: Summary of the reviewed articles. (BF= breastfeeding , EBF= exclusive breastfeeding, All Confidence Intervals (CI) are set to 95%)

Author	Study type & Sample	Results (BF= breastfeeding , EBF= exclusive breastfeeding, All Confidence Intervals (CI) are set to 95%)
Chen Huang et. al (2017)	<ul style="list-style-type: none"> • cross-sectional • n = 13,335 • Children 4–6-yrs-old, China 	<ul style="list-style-type: none"> • Compared to never breastfed, EBF for 3-6 months was associated with a reduced risk of asthma and >6 months for eczema • Longer duration BF was only significantly protective with no family history of atopy.
Chih-Yung Chiu et al. (2016)	<ul style="list-style-type: none"> • Birth Cohort • n = 186 • Children 1-2 yrs old, Taiwan 	<ul style="list-style-type: none"> • BF ≥6 months was significantly associated with a reduced risk of developing eczema but not asthma. At 2 yrs old [aOR 0.36(0.13-0.94) P=0.038] • Partial BF <6 months was significantly associated with an increased risk of developing eczema. At 2 yrs old [aOR 7.64(1.78-32.70) P=0.006]
Filipiak-Pittroff et al. (2017)	<ul style="list-style-type: none"> • Prospective Cohort • n = 5,991 • birth to 15 yrs old 	<ul style="list-style-type: none"> • No association between fully BF and asthma • Low cumulative incidence of eczema in the fully breastfed group compared to the Cow Milk Fed group (aRR = 0.73; [0.55-0.97])
Jelding-Dannemand et al. (2015)	<ul style="list-style-type: none"> • Prospective • n = 335 children 1, 6, & 12 months 	<ul style="list-style-type: none"> • No significant association between duration of EBF and asthma (OR, 1.07 [0.92-1.24]) or eczema (OR, 0.97 [0.82-1.14])
Miyake et al. (2007)	<ul style="list-style-type: none"> • Cross-sectional • n = 24,077 • Children aged 6-15 in, Japan 	<ul style="list-style-type: none"> • BF, regardless of exclusivity, for ≥13 months and EBF for 4–11 months independently associated with a higher prevalence of atopic eczema, particularly among children without a parental allergic history. (OR= 1.18;1.01–1.37, p = 0.02)
Flohr et al. (2012)	<ul style="list-style-type: none"> • Cross-sectional • n = 51,119 • 8-12-yr-old children (21 countries) 	<ul style="list-style-type: none"> • BF <6 months → small increase in risk of eczema. (OR 1.10 [1.02–1.20]) • No significant association between eczema and BF >6 months. (OR 1.09 [0.94–1.26]) • BF → risk reduction on sleep disturbed eczema (OR 0.71 [0.53–0.96])
Silvers K. et al., (2009)	<ul style="list-style-type: none"> • Prospective cohort • n = 1011 children • Birth to 15 months New Zealand 	<ul style="list-style-type: none"> • BF → significant reduction in the risk of adverse respiratory outcomes at 15 months. • Each month of EBF reduced the risk of asthma by 20% (OR = 0.80, 0.71 to 0.90), • BF was not associated with eczema or atopy at 15 months.
Silvers, Frampton et al. (2012)	<ul style="list-style-type: none"> • Prospective cohort • n = 1011 • Birth to 15 months, New Zealand 	<ul style="list-style-type: none"> • Each month of EBF → significant reductions in current asthma from 2 to 6 yrs. (p<.03). • Current asthma at 2, 3, & 4 yrs was reduced by each month of any BF (p<.005)
Tanaka et al. (2010)	<ul style="list-style-type: none"> • Cross-sectional • n = 1,957 • Children aged 3 yrs, Japan 	<ul style="list-style-type: none"> • EBF for ≥4 months → lower prevalence of asthma (aOR 0.69, 0.50–0.96) • No statistically significant relationship between the duration of EBF and the prevalence of eczema (aOR 0.90, 0.71–1.15])

Discussion

There are few studies looking at the exact relationship that was sought out in this review. All studies analyzed a varying number of results in conjunction with exclusive breast feeding, within different populations, and with different comparison groups. Exclusive breastfeeding may be have protective effects at certain ages rather than a continuous effect throughout infancy and adolescence. 3 studies present an increased risk of eczema. Limitations include publication bias from English only studies, recall biases from mothers with allergic children compared to those without, and assumptions of homogeneity. Furthermore, observational studies are used which leads to inherent biases and inability to control for various confounders. Breastfeeding has been shown to have protective effects on various negative outcomes in other studies and meta-analysis¹⁶. Although the results of the current review are relatively inconclusive, there are known benefits of exclusive breastfeeding. Based on the studies found through our search, we are unable to make a recommendation in regards to, length of breastfeeding or exclusive vs non-exclusive breastfeeding in relation to a reduction in asthma or eczema outcomes.

Conclusion

Exclusive breastfeeding for at least three months *may* be protective against asthma and eczema in children. When found protective, it is unclear if the effects extend from birth to adulthood or only at certain ages. Family history of asthma or eczema might have a role in the development of the disease, more research is needed to confirm or refute this association. Additionally, the method in which breastfeeding increases the risk of asthma and eczema in some people, while reducing it in others, is still yet to be determined. However, due to discrepancies, more research is required to investigate the covariates that may predispose or protect children from these allergic reactions.