



Should Breastfeeding Mothers Avoid Allergenic Foods?

Abstract

Questions about maternal diet in lactation are common in clinical nursing practice, for nurses often work with breastfeeding women who are concerned about allergies, or who associate infant symptoms of crying or irritability to something they themselves have eaten. Can exposure to food proteins in a woman's diet actually cause food allergy in her breastfed child? Are special diets effective in managing infant allergic symptoms or gastrointestinal distress? The purpose of this article is to review the evidence related to diet for new breastfeeding mothers and make recommendations to guide clinical practice; seven such practice recommendations were developed after a thorough literature review. Nurses can use this literature summary to provide care based upon the best available research evidence.

Key words: Allergens; Breastfeeding; Hypersensitivity; Infant.

One of the common questions that new breastfeeding mothers ask nurses is what foods they should eat or avoid. They may think their infant's fussiness, gassiness, or spitting-up is caused by foods they have eaten, and avoid essential foods in an effort to ease their baby's symptoms. Breastfeeding mothers may also eliminate foods from their diet on their own because they are concerned about allergies, especially if there is a history of allergic disease in other family members or themselves. Should mothers avoid certain foods while they are breastfeeding? Are special diets effective in reducing periods of infant crying or gastrointestinal distress? Can exposure to food proteins in a mother's diet actually cause food allergy in her breastfed child?

The answers to these questions and others are important in the care of breastfeeding infants and their mothers. The incidence of atopic diseases (genetic tendencies toward certain hypersensitivity reactions) such as asthma, atopic dermatitis, and food allergies has increased dramatically over the past several decades (Greer, Sicherer, & Burks, 2008). According to the National Health Interview Survey in 2009, asthma among children ages 15 and under is one of the most common childhood illnesses, with a prevalence of 9.8% (Centers for Disease Control and Prevention, 2010). Food allergies are also common, affecting 6% to 8% of children under the age of 4 (National Institute of Allergy and Infectious Diseases, 2008). Although genetic factors play a role in susceptibility to atopic disease, environmental factors are important in triggering actual disease expression (Greer et al., 2008), and diet is one environmental factor that needs to be considered. Many believe that there may be an opportunity to prevent or delay the onset of these diseases through dietary modifications.

Nurses need evidence-based information to help guide their counseling of new mothers and prevent situations in which the mother's or infant's health could be at risk due to an overly restrictive diet. Answering questions about diet for new breastfeeding mothers requires an awareness of the best current research evidence along with knowledge of the mother's cultural practices and preferences. The purpose of this article, therefore, is to review the evidence related to diet for new breastfeeding mothers and make recommendations to guide clinical nursing practice.

Clinical Question

An evidence-based practice approach to patient care involves asking questions that can be answered by the research literature. These are sometimes referred to as PICO questions: identifying the population or problem (P), selecting the intervention of interest (I), a comparison (C) (if appropriate), and defining an outcome (O). For the breastfeeding mother concerned about her diet, the following clinical question was chosen to begin the search of the literature: *In breastfeeding infants, does maternal dietary antigen avoidance versus a regular maternal diet prevent or decrease infant atopic symptoms?* The population (P) in this question is breastfeeding infants, the intervention (I) is dietary antigen avoidance, the comparison (C) is regular diet, and the outcome (O) is signs of atopy. Dietary antigen avoidance is the elimination of one or more food proteins known to be associated with allergies or intolerance. For the purpose of this review, signs of atopy included those associated with colic, eczema or atopic dermatitis, wheezing, asthma, and food allergy.

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Methods

Search terms were selected based on keywords related to the PICO question: infant, breastfeeding, atopy, allergy, maternal diet, lactation, allergens, dietary proteins, hypersensitivity, and colic. Inclusion criteria were studies in which (a) mothers were breastfeeding the infants, (b) maternal elimination diet was being used as an intervention, and (c) outcome measures included infant symptoms of eczema, wheezing, asthma, food allergy, or colic. Studies that included pregnancy only were excluded, for our clinical question focused on maternal diet in lactation, not during pregnancy. Additionally, studies were excluded if multiple environmental interventions in addition to maternal elimination diet were used to reduce infant exposure to antigen to eliminate confounding factors related to outcome.

Primary research using randomized controlled trials were preferred; therefore, the Cochrane Database of Systematic Reviews (CDSR) was searched first followed by other sources of evidence-based medicine reviews and guidelines. The search of CDSR resulted in one relevant systematic review (Kramer & Kakuma, 2006). Medical Subject Headings (MeSH®) terms from this review were used to search for additional studies utilizing PubMed's MeSH database.

The Strength of Recommendation Taxonomy (SORT) literature grading scale (Ebell et al., 2004) was used to appraise the evidence. Individual studies were critically



Table 1: Results of the Literature Search and SORT Evidence Level Assigned to Each Article

References	Study Design	Primary Objective	Primary Finding	Level
Garrison and Christakis (2000)	Systematic review	To investigate treatments for infant colic	Daily duration of colic symptoms were reduced by >25% for infants whose mothers followed a hypoallergenic diet.	2
Gdalevich et al. (2001)	Systematic review	To investigate the association between exclusive breastfeeding and atopic dermatitis	Exclusive breastfeeding during the first 3 months of life was associated with a lower incidence of atopic dermatitis during childhood in children with a family history of atopy.	2
Hill et al. (2005)	Randomized controlled trial	To assess the effects of a hypoallergenic maternal elimination diet on persistent crying among breastfed infants presenting with colic	Exclusion of allergenic foods from the maternal diet was associated with a reduction in distressed behavior among breastfed infants with colic in the first 6 weeks of life.	1
Kramer and Kakuma (2006)	Systematic review	To assess the effects of prescribing a maternal antigen avoidance diet on maternal and infant nutrition and on the prevention or treatment of infant atopic disease	Prescription of an antigen avoidance diet to a high-risk woman during pregnancy is unlikely to substantially reduce her child's risk of atopic diseases, and such a diet may adversely affect maternal or fetal nutrition, or both. Prescription of an antigen avoidance diet to a high-risk woman during lactation may reduce her child's risk of developing atopic eczema, but better trials are needed.	2
Lake (2000)	Case series	To describe the clinical features, diagnosis, treatment, and pathophysiology of allergic colitis	Elimination of the offending protein from the diet of the infant, through use of an extensively hydrolyzed casein-based formula or the elimination of the protein from the diet of the mother of the breastfeeding infant, led to clinical resolution of gastrointestinal bleeding.	3
Palmer et al. (2005)	Randomized controlled trial	To compare the concentration of ovalbumin in human milk with the quantity and form of egg consumed by breastfeeding mothers	Ovalbumin was detected in the breast milk of lactating women up to 8 hours after a controlled intake of egg. Further studies are needed to determine the threshold of ovalbumin excretion that leads to symptoms in egg-allergic breastfed infants.	3
Schoetzau et al. (2002)	Prospective cohort	To assess the effects of exclusive breastfeeding on atopic dermatitis in infancy	Exclusive breastfeeding for at least 4 months was effective in reducing atopic dermatitis in the first year of life for infants with a family history of atopic disease.	2
Vance et al. (2004)	Randomized controlled trial	To investigate the relationship between cord blood IgG to ovalbumin at birth and signs of atopy at 6 months of age	Maternal dietary egg consumption was not associated with the development of infant atopy.	3
Zeiger (2003)	Consensus guideline	To summarize recommendations from the American Academy of Pediatrics and two professional European organizations on the primary and tertiary prevention of food allergy	There is general agreement between recommendations from professional organizations for a trial elimination diet during lactation with attention to potential maternal nutritional deficiencies.	3

Note. Quality level for an individual article is based on the SORT literature grading scale (Ebell et al., 2004).



Can exposure to food proteins in a mother's diet actually cause food allergy in her breast-fed child?

appraised and assigned a numerical rating of 1, 2, or 3 under the SORT grading scale and recommendations for clinical practice were assigned a letter grade of A, B, or C (Ebell et al., 2004). High-quality research designs and studies measuring patient-oriented outcomes (such as improvement in morbidity, symptoms, quality of life, or cost) were assigned a higher level. A total of 59 articles were retrieved; of these, nine articles were relevant to our

between studies. Table 2 lists these recommendations and the SORT grade of A, B, or C assigned to each one. The body of evidence for maternal dietary antigen avoidance in lactation for the prevention or control of infant symptoms of atopy consists of predominantly limited-quality studies, some of which had inconsistent findings; therefore, most of the recommendations for care received a grade of B using the SORT grading scale.

clinical question and met inclusion criteria for our project. Table 1 summarizes these articles and the quality level assigned to each.

Findings from the literature review were then synthesized into evidence-based recommendations for clinical care. A judgment of the strength of each recommendation was made based upon the body of evidence supporting it. Recommendations received a SORT grade of A, B, or C depending on the quality of evidence and consistency of findings

Table 2: Key Recommendations for Maternal Diet and Allergy and SORT Grade for Strength of the Recommendation

Evidence-Based Care Recommendations	Strength of the Recommendation
Exclusive breastfeeding for at least 4 months is recommended for infants at high risk for developing atopic disease (Gdalevich et al., 2001; Schoetzau et al., 2002).	B
Elimination diets in pregnancy and lactation are not recommended to prevent the development of atopic disease in children (Kramer & Kakuma, 2006; Palmer et al. 2005; Vance et al., 2004).	B
There is insufficient evidence to recommend an elimination diet for mothers of children with atopic eczema. One study found that low-allergen diets in mothers of infants with established atopic eczema reduced eczema severity scores (Kramer & Kakuma, 2006). If mothers have chosen to follow an elimination diet in an attempt to alleviate symptoms in their infant, they should be given information on the unknown benefits and risks of such a measure.	B
There is insufficient evidence to recommend an elimination diet for breastfeeding mothers with atopic disease. One study found that a maternal dairy elimination diet in mothers with atopic disease may reduce atopic eczema symptoms in her breastfed infant (Kramer & Kakuma, 2006). If mothers have chosen to follow an elimination diet in an attempt to alleviate symptoms in their infant, they should be given information on the unknown benefits and risks of such a measure.	B
A low-allergen maternal diet is recommended to reduce symptoms of colic in infants younger than 6 weeks (Garrison & Christakis, 2000; Hill et al., 2005).	B
For infants with a confirmed food allergy, the causal food must not be consumed by the infant or the breastfeeding mother (Lake, 2000; Zeiger, 2003).	C
Dietary counseling is recommended to prevent nutritional deficiencies in mothers avoiding allergenic foods (Fleischer, 2008; Kramer & Kakuma, 2006; Lifschitz, 2008; Zeiger, 2003).	C

Note. Grade for the strength of the recommendation is based on the SORT literature grading scale (Ebell et al., 2004).

Results

Protective Effects of Breastfeeding Despite Maternal Diet

Studies have examined the protective effects of breastfeeding on the development of atopy in infants with at least one first degree relative (parent or sibling) with documented allergic disease. A systematic review by Gdalevich, Mimouni, David, and Mimouni (2001) examined breastfeeding and the manifestations of skin atopy. The review and meta-analysis included 18 prospective studies meeting strict selection criteria in which the odds ratios (OR) of atopic dermatitis associated with breastfeeding were reported or could be estimated. A total of 4,158 participants were included in the trials. Mean follow-up time was 4.5 years. Exclusive breastfeeding was associated with a lower incidence of atopic dermatitis (OR 0.68, $P < .0001$) and the protective effect was more pronounced in children with a family history of atopy (OR 0.58). Another prospective randomized cohort study (Schoetzau, et al., 2002) found exclusive breastfeeding in the first 16 weeks of life to decrease the risk of atopic dermatitis in the first year by nearly 50% compared with cow's milk feeding (OR 0.47, 95% CI 0.30; 0.74). Although these studies examined the effects of human milk feeding on infant atopic disease independent of a potential maternal dietary influence, they do provide important information for mothers concerned about infant allergic disease.

Maternal Antigen Avoidance

Maternal dietary antigen avoidance during lactation was examined as a potential factor related to the prevention or treatment of pediatric atopic disease in a Cochrane Systematic Review of randomized controlled trials by Kramer and Kakuma (2006). The authors concluded that the evidence is inadequate to advise breastfeeding women to avoid specific foods during lactation to protect their children from allergic diseases such as asthma and eczema, or atopic dermatitis. Kramer and Kakuma also considered the possible adverse effect of an avoidance diet on the nutritional status of the fetus or mother. Although maternal diet does affect maternal serum, cord blood, and milk antigen concentrations (Palmer, Gold, & Makrides, 2005; Vance et al., 2004), the effect on immune response in the infant is unclear. Therefore, the evidence is insufficient to state that maternal dietary antigen avoidance is either beneficial or harmful.

Genetic Considerations

Another consideration is the possible effect of a genetic tendency toward atopic disease in families. Kramer and Kakuma (2006) did include trials that examined the effects of maternal diet on infant atopy when either the infant or the mother had established atopic disease. According to Kramer and Kakuma, there is limited evidence for a low-allergen



Research suggests a maternal antigen avoidance diet may help to alleviate signs of colic in breastfeeding infants younger than six weeks of age.

maternal diet during breastfeeding for infants with atopic eczema. The authors also report that there is limited evidence for maternal avoidance of cow's milk during lactation to decrease the incidence of infant atopic eczema among mothers who have a history of atopy. Kramer and Kakuma (2006) concluded that prescription of an antigen avoidance diet to high-risk women (i.e., women with a history of atopic disease) during lactation may reduce their child's risk of developing atopic eczema, but better trials are needed before definitive statements can be made in that regard.

Diet and Colic

The relationship between maternal diet and infant colic has been examined in the research literature. A systematic review by Garrison and Christakis (2000) reported that data regarding utilization of hypoallergenic diets by breastfeeding mothers were inconclusive, but suggest that there may be some therapeutic benefit. These studies were limited by small sample sizes, highly subjective case definitions, and the difficulty in blinding participants to treatment allocation. In a randomized control trial by Hill et al. (2005), infant distress scores and cry/fuss duration were reduced in colicky breastfed infants under 6 weeks of age when their mothers followed an antigen avoidance diet.

Infant Food Allergies

When an infant is definitively diagnosed with a food allergy, the breastfeeding mother should avoid that food in her diet. Elimination of the protein from the diet of the breastfeeding mother has been shown to improve food allergy symptoms (Lake, 2000; Zeiger, 2003). Breastfeeding mothers who are avoiding essential foods in their diet because of an identified infant food allergy, however, may be at risk for nutritional deficiencies. Appropriate dietary counseling is recommended to ensure proper maternal nutrition during lactation (Kramer & Kakuma, 2006; Zeiger, 2003).

Conclusion

To answer the question posed in the title of this article: There is not enough evidence to tell breastfeeding mothers

to avoid allergenic foods in order to prevent allergic diseases in their children, and maternal avoidance of essential foods could lead to nutritional deficiencies. The literature suggests that an elimination diet for a breastfeeding mother may be appropriate in two instances: when an infant less than 6 weeks of age has signs of colic, and when an infant has a confirmed food allergy. In all other cases, the risk of nutritional deficiencies outweighs the unknown benefits of antigen avoidance diets. Nurses can use this literature summary to provide care that is based on the best available research evidence. Evidence-based recommendations from this literature review for the breastfeeding mother's diet as it relates to allergy are:

- Breastfeed exclusively for at least 4 months if the infant is at high risk for developing atopic disease.
- Elimination diets in pregnancy and lactation are not recommended to prevent the development of atopic disease and may adversely affect the nutritional status of the fetus or mother.
- There is insufficient evidence to recommend an elimination diet for mothers of children with atopic eczema.
- There is insufficient evidence to recommend an elimination diet for breastfeeding mothers who themselves have atopic disease.
- A low-allergen maternal diet is recommended to reduce signs symptoms of colic only in infants younger than 6 weeks of age.
- If an infant has a confirmed food allergy, the causal food should not be consumed by the breastfeeding mother.
- If a breastfeeding mother is avoiding allergenic foods, she should be referred for dietary counseling to prevent nutritional deficiencies.

There are 7 key recommendations for the breastfeeding mother's diet as it relates to allergies.

Nurses can use this information along with their clinical expertise and their patient's values and preferences to guide the care of breastfeeding mothers and infants in their practice. ✦

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American Academy of Pediatrics

www.aap.org/healthtopics/breastfeeding.cfm

American Dietetic Association

www.eatright.org/default.aspx

Association of Women's Health, Obstetric and Neonatal Nurses

www.awhonn.org/awhonn/content.do?name=02_PracticeResources/2C1_Breastfeeding.htm

The National Women's Health Information Center

www.womenshealth.gov/breastfeeding/

USDA Food & Nutrition Service WIC Program

www.mypyramidforkids.gov/wic/Breastfeeding/breastfeedingmainpage.HTM