The Effects of Breastfeeding on Disease Risk Reduction

By Dee Murphy

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Methods and Strategies for Community-Based Nutrition Services

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Introduction

If women knew they had something that could lessen their child's risk of sudden infant death syndrome (SIDS), obesity, diarrhea, childhood cancer, asthma, cardiovascular disease and could increase intelligence, would they give it? What if women knew that they could also decrease their own chances of developing breast cancer or rheumatoid arthritis? If women knew that they would need to give this special something to their baby for at least six months, maybe more, would they still want to do it? What would happen if women knew that breastfeeding was this special something?

Ever since women have been able to feed babies' cow's milk, public health officials have been trying to educate them on the need to breastfeed. Breastfeeding rates in the United States have fluctuated for decades. In 1971, breastfeeding reached an all-time low in the US with only 24% of mothers initiating breastfeeding in the hospital (1). Since then, rates have climbed. In 2002, Abbott Laboratories' Ross Products Division found that 70.1% of mothers initiated breastfeeding (2). This is good news, but it could be better. The American Academy of Pediatrics (AAP) (3) and the World Health Organization (WHO) (4) advise women to exclusively breastfeed their infants for six months and to continue breastfeeding for 12 to 24 months. Exclusive breastfeeding, giving no other food or fluid besides breast milk, has been shown to help guard against some diseases. Unfortunately, only 17% of American women exclusively breastfeed for six months and fewer than 5% continue to breastfeed for one year (1).

Public health officials are always trying to find ways to lower disease rates, and they have started looking at breastfeeding as part of the solution. Recent studies suggest that breastfeeding can lower risk of overweight or obesity by 13-22% (5). Prevention of overweight and obesity may also decrease the risk of developing some diseases. This paper will discuss recent studies supporting breastfeeding's role in disease reduction, particularly in the areas of overweight/obesity, cardiovascular disease, and breast cancer.

Protection against Overweight/Obesity

Although not a disease, overweight/obesity is associated with high blood pressure, high cholesterol, high triglycerides, and elevated insulin levels, all of which can lead to disease. These problems have become more prevalent in children in recent years. Overweight children often become overweight adults. In fact, in 1999-2000, over 15% of school-age children and adolescents were overweight (6) and more than 70% of adults over age 60 were overweight or obese (7). Infant weight gain might be related to the risk of overweight in both groups. A study conducted by Stettler and colleagues (8) showed that a more rapid weight gain during the first four months of life was associated with an increased risk for childhood overweight and cardiovascular disease later in life. Potential interventions to prevent excessive weight gain in infancy include breastfeeding, because infants who are breastfed may not gain weight as rapidly as those who are bottle fed (7).

Duration of breastfeeding has also been found to be important in the fight against overweight/obesity. A study published in *Pediatrics* in 2004 by Grummer-Strawn and Mei (9) compared breastfeeding duration rates and weight among children who attended public health clinics across the country. Study results showed that in non-Hispanic white

populations there were lower rates of overweight among those children who had been breastfed longest. Specifically, the rate of overweight at 4 years of age was highest among children who were never breastfed or who were breastfed for less than 1 month, but overweight decreased with increased breastfeeding duration. Hispanic children are at nearly twice the risk for becoming overweight, probably because of different dietary and physical activity patterns that breastfeeding may not be able to overcome (9).

Other research agreed that breastfeeding lowered the risk of overweight in children. One study, conducted by Mayer-Davis and colleagues, (5) looked at over 15,000 children ages 9-14, along with their mothers. Researchers found that overweight youth were more likely to have mothers who were either overweight or had diabetes. They were also more likely to have been formula fed or only breastfed for a short period of time. However, longer breastfeeding duration and exclusivity showed a protective effect against overweight, even among mothers who were overweight or had diabetes. Another study, conducted by Schaifer-Graf and colleagues (10) looked at children of mothers who had gestational diabetes, a population previously shown to have a high risk of infant overweight. Researchers concluded that childhood overweight could be reduced by 40-50% when infants were breastfed for over three months.

Three possible explanations for breastfeeding's effect on overweight/obesity rates include learned self-regulation of energy intake, properties of breast milk and/or metabolic programming, and family environment (6,9). An advantage of breastfeeding is that infants end their own feedings, listening to internal satiety cues. Bottle-fed infants might be encouraged to finish their feeding even if they were full, a practice that could

lead to problems with self-regulation of energy intake later in life. Breastfeeding may contribute to lower levels of plasma insulin and leptin, key regulators in determining body fatness. Finally, parents who choose to breastfeed may have a healthier lifestyle in general, with optimal dietary habits and more physical activity. While lifestyle factors do have a greater impact on overweight/obesity rates than breastfeeding does, these studies suggest that breastfeeding has a place in the fight against the problem.

Protection against Cardiovascular Disease

Not only does breastfeeding appear to lower overweight/obesity rates, it may also help lower blood cholesterol levels later in life (11). High total cholesterol (TC) and low-density lipoprotein (LDL) cholesterol levels are two risk factors associated with cardiovascular disease, especially when combined with excess body fat and high blood pressure. Two studies suggest that breastfeeding may have an effect on reducing cholesterol levels and blood pressure.

Owen and colleagues (12) reviewed past studies of infant feeding and blood cholesterol levels and found that mean TC levels were higher in breastfed infants compared with bottle-fed infants. In adults age 17-64 years old, mean TC levels were somewhat lower in those who were breastfed. Mean LDL levels were lower among all adults who were breastfed as infants.

The association between breastfeeding and higher TC and LDL in infancy may be directly related to the higher cholesterol content found in human milk. Higher cholesterol intake in infancy may protect against dietary fat intake later in life. Although the causality of the association between breastfeeding and lower TC and LDL in adults has

still to be established, this could represent a form of nutritional programming whereby a stimulus acting at a critical period of growth has lasting or lifelong significance. Even this small reduction in TC in adults could reduce cardiovascular disease rates by 10% (12).

Martin and colleagues (13) conducted a systematic review and meta-analysis of breastfeeding in infancy and blood pressure in later life. Fifteen studies with over 17,500 subjects showed breastfed infants had 1.4-mmHg lower systolic blood pressure compared with bottle-fed infants. Diastolic blood pressure was 0.5-mmHg lower in the breastfed infants group.

There are several reasons that breastfeeding could influence blood pressure, including reducing sodium intake in infancy, increasing intake of long-chain polyunsaturated fatty acids, protecting against hyperinsulinemia in infancy and insulin resistance in early life, adolescence and adulthood. Any of these processes can raise blood pressure for a number of reasons (13).

Breastfeeding may give some protection against cardiovascular disease later in life, but the amount of protection is not known. Further study is needed to better understand the reasons and extent breastfeeding can lower cardiovascular disease risk.

Protection against Breast Cancer

Breast cancer is not only of great public health significance, it is also a disease that affects an organ with powerful symbolic and emotional connotations related to feminity, sexuality, and maternity (14). Breastfeeding also has strong emotions attached to it. Women should be allowed to breastfeed their children if and for how long they

want. However, there is evidence that women who breastfeed may have a reduced risk of developing breast cancer.

One example of this comes from a study conducted by Lee and colleagues (15) involving over 110,000 premenopausal Korean women with children. Researchers confirmed that lactation was associated with a significant reduced risk of breast cancer. Study results also demonstrated a significant and clear inverse relationship between lifetime lactation and breast cancer risk, especially in women who had breastfed for a minimum of 2 years.

Beral and colleagues (16) analyzed data from 47 epidemiological studies in 30 countries involving over 50,000 women with breast cancer and over 96,000 women without the disease. From this analysis, we now know that simply giving birth reduced the relative risk of breast cancer by 7.0%. However, for each birth, the relative risk was slightly lower for women who had breastfed than for women who had not. This study concluded that the relative risk of breast cancer was reduced by 4.3% for each year that a woman breastfed, in addition to the reduction of 7.0% for each birth. Long-term breastfeeding lowered breast cancer risk, whereas women who breastfed for only short durations or not at all showed much higher incidences of breast cancer. Based on this study, if women in developed countries had 2.5 children, on average, but breastfed each child for 6 months longer than they currently do, about 25,000 breast cancers would be prevented each year, and if each child were breastfed for an additional 12 months about 50,000 breast cancers might be prevented annually.

The public needs to be cautioned that long-term breastfeeding does not guarantee total protection from breast cancer. There are other reasons that women get the disease besides their breastfeeding practices. Breastfeeding only serves to reduce risk for developing breast cancer and breastfeeding may simply delay the occurrence of breast cancer in younger women (14). More research is needed to know which one is true.

Conclusion

Breastfeeding advocates have long touted the benefits of breastfeeding. Recent studies have supported these benefits. Although breastfeeding initiation rates have climbed in recent decades, breastfeeding duration and exclusivity rates have not. In the fight to overcome health problems such as overweight/obesity, cardiovascular disease and breast cancer, more families need to know about the benefits of long term and exclusive breastfeeding. Health care providers must learn ways to support mothers in their desire to breastfeed their children. These health issues are complex and breastfeeding is only part of the solution. However, good health begins by developing healthful habits early in life. Breastfeeding babies may be the best place to start.

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