

Editorial

Infection, Allergy, and the Protection from Breastfeeding

Ruth A. Lawrence

IN OCTOBER 2008 AT THE 13th Annual Meeting of the Academy of Breastfeeding Medicine, W. Allan Walker, M.D., delivered the Third Annual Founder's Lecture entitled "Breastfeeding—A Link Between Mother and Child." Dr. Walker was invited to share those special thoughts on paper for *Breastfeeding Medicine*. Dr. Walker collaborated with Samuli Rautava, M.D., Ph.D., who shared in the writing. Dr. Rautava is a young postdoctoral colleague who had been working in Walker's Developmental Gastroenterology Laboratory at Massachusetts General Hospital for Children and has returned to Turku University Central Hospital in Turku, Finland. We have presented this remarkable review in this issue of the journal.

This invited commentary is an exhaustive review of what we know about the wide array of bioactive molecules that the mother shares with her infant through her milk. This summary of the infection properties we glibly refer to in our clinical defenses of breastfeeding details their apparent roles in protecting the infant against infection and modulating the infant's immunophysiology microbiota. The authors describe how this is thought to work through the immunodulation that affects infant health and in addition long-term health.

The discussion confirms the role of human milk in infant disease by reporting several large epidemiologic studies from around the world. The authors point out that results of clinical trials, for instance, of necrotizing enterocolitis in neonates has resulted in such strong evidence of protection that many centers now provide minimal enteral feedings of breastmilk (mother's and/or donor) in the first few days of life as a standard practice to all preterm infants.

The role of secretory IgA κ -casein, α -lactalbumin, lysozyme, α - and β -defensins, and oligosaccharides to protect against pathogens is explained. The factors that modulate intestinal immunity such as epidermal growth factor and transforming growth factor (TGF)- β are clearly described, and their activity and impact are documented. The cytokines, their receptors, the growth factors, and functional maternal immune cells are all part of the picture. The explanation begins with experiments in animal models of mice, including TGF- β knockout model mice. Immune maturation in the human infant is then described.

Infection protection is not the only phenomenon referenced, but the role of human milk in allergy protection is also described, shedding light on a subject that has long been

studied in clinical trials where it is not possible to carry out blinded placebo-controlled experiments to establish the protective effects of breastmilk.

The authors point out that long-term health outcomes are being associated with breastfeeding, which is believed to reduce the risk of atopic disease, obesity, and related metabolic disorders. The mysteries are not completely unraveled, but the authors believe that there are as yet unknown effects of breastfeeding that research has still to uncover.

The information is detailed. It may take a second reading unless you are an immunobiologist. The bibliography is detailed and current.

One expression caught my eye, however, in the first few paragraphs. In the abstract and again in the introduction nutrients in human milk are described as "near-optimal" and then "close to optimal" quantities. I was alarmed, but Walker has carefully explained the justification for this seemingly disturbing terminology. He said:

The comment about near-optimal nutrition and close to optimal quantities of nutrition did not imply that breastmilk was being compared to a formula. There is no comparison. You and I both agree on that. Our concern is the studies from a number of people suggesting that the maternal diet may influence the composition of breastmilk. I am thinking specifically of Susan Carlson's work suggesting that the saturated fatty acid intake of women in the Midwest who tend to eat beef and not fish end up producing breastmilk that is high in saturated fats and low in omega-3-fatty acids.

The array of peer-reviewed original manuscripts also appearing in this issue provides some very important information for the reader.

The barriers to exclusive breastfeeding for Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) enrollees found by the study of Holmes et al. documents what many have long suspected: WIC participants see WIC as highly supportive of breastfeeding but also as a promoter of infant formula. The value of formula the clients felt exceeds the value of the upgraded food package for breastfeeding mothers. This piece is especially significant because it is the first paper this journal has published using qualitative research (compared to quantitative) to find the

answer. This method requires many hours of interviews and even more time analyzing the results. It, however, provides new insights not seen when a forced answer design is utilized.

Taylor and colleagues provide evidence in their article of significant difference in the intestinal permeability of premature infants fed mother's milk or cow milk-based formulas. This is but another reason to follow the suggestion of Rautava and Walker that all premature infants receive min-

imal enteral feedings of breastmilk in the first few days of life as a standard of practice.

Slowly the evidence is gathering to solidly establish the original premises of the value of human milk that advocates have supported for decades. Is it not strong enough yet for the doubting clinician?

—*Ruth A. Lawrence, M.D., FABM*
Editor-in-Chief