Viewpoint

The Human Milk: Prejudice versus Science

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Abstract

Exclusive breastfeeding for the nutrition of healthy term infants is currently considered as the gold standard. Indeed, the widely held prejudice against human milk is something of the past. However, the universal acceptance of this fact on mothers' part is still to be achieved. Meanwhile, the widespread of baby-friendly hospital initiative movement makes it increasingly harder to question the safety or efficacy of this practice, even in the face of some concerning reports of unwanted outcomes. Apparently, there is a need for better compliance with safe sleep instructions while actively promoting breastfeeding practices. In some specific situations, breastfeeding becomes impractical, extremely difficult, or even contraindicated. Using a suitable formula in these circumstances becomes a must. Given all of this, a greater emphasis should be placed on efforts to improve the quality of currently available formulas and/or creating new ones that better meet the nutritional needs of all infants.

Keywords: Breastfeeding, formulas, human milk, nutrition

Introduction

The story of human milk and its rise to the esteemed status it currently enjoys has been checkered by centuries of impediment and disdain, even by those expected to promote it. Indeed, the soon after birth nutritional separation of infants from their mothers was commonplace. This practice stemmed, most likely, from the belief that human milk is impure and unhealthy; Aristotle equaled human milk with retained menstrual blood,[1] Galen claimed that "the source of milk is from blood undergoing a slight change in the breasts."[2] Apparently, Ancient Greeks believed in the presence of a physical connection that transfers the raw material for milk production from the uterus to the breasts. These views continued to prevail in Europe for a long time, throughout middle ages and well beyond.

The "Bad" Milk

The wrong impressions about the safety and purity of human milk were the basis for advising nursing mothers to get rid of it by any means, "mother should let herself suck by a whelp"[3] and "If, however, she suckles her infant from the beginning, some honey and rose honey should be applied before breastfeeding so that the milk injures it less." The seventeenth-century midwives book[4] recommended postponing breastfeeding until the lochia cease "because those unclean purgations cannot make good milk." Whereas eighteenth-century Nurse's Guide[5] warned against several disorders that could affect the infant from nursing on this milk. "He will be subject to the Epilepsy, or Falling-Sickness." In the nineteenth century, Morton[6] elaborated on such diseases that "frequently arise in children from lactation," they included "rickets, convulsions, epilepsy, and finally, meningitis, which gives increase to the well-known and fatal disease termed hydrocephalus." As for the "harms" of breastfeeding process on maternal health, Morton concluded: "Disorders frequently produced in women by that process;… lose their good looks, become gradually weaker, and as their strength declines, their milk is simultaneously lessened in quantity, and altered in its other properties,… pain in the head,… perspirations by the night,… and pulmonary consumption." Furthermore, many authorities recommended that women should not breastfeed when they return to their normal sexual activity after birth; because this will turn their milk "very harmful,… a real venom for the infants."[3]

This practice of discarding "the unclean milk" and postponing breastfeeding made it impossible, except for few mothers, to

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maintain lactation. Thus, delayed breastfeeding became, in reality, no breastfeeding at all. Luckily, the advent of modern ages brought some changes, and voices of dissent started to increase. Cadogan[7] wrote: "mother's first milk is purgative, and cleanses the child from its long-hoarded excrement." Boerhaave[8] also reported the benefits of colostrum: "The first milk after delivery is not thick, but watery, subtle, and very much different to that which accumulates in the breast during the milk fever. It purges the infant gently and cleans the digestive tract."

A View From the East

Local civilizations on the other side of the Mediterranean basin had different views of this issue; the value of human milk was reflected in their folklore and mythology, which designated cherished goddesses (such as Inanna in Mesopotamia and Hathor in Egypt) as protectors of breastfeeding. According to the Ebers papyrus,[9] dating back to sixteenth century BC, infants in ancient Egypt were breastfed for 3 years. It asserts that "nothing is more lawful than one's mother's milk." Of interest, Biblical sources indicate that the average duration for suckling was about 3 years and the hire of wet nurses was a well-organized practice a thousand of years before Christ.[10]

Avicenna (Ibn Sina),[11] in his prominent book Canon of Medicine wrote: "whenever possible, mother's milk should be given and by suckling. The duration of lactation normally is 2 years… weaning must not be abrupt.… If there be anything to prevent the mother from giving milk, a wet nurse should be selected." This advice resonates well with the Qur'anic teaching that decrees: "mothers shall give suck to their children for two whole years" (Qur'an, 2:233) and if a mother is unable or unwilling to do so then the infant's father has to hire a wet nurse for this job.

Early Formulas

Industrialization of the west triggered many cultural and societal changes. Importantly, increased involvement of women in the workforce created a legitimate need for a human milk substitute that infant can use as mother returns to her work. Attempts to create such a substitute in the early 1800s were quite disappointing. Around the mid of the nineteenth century, a home-made liquid formula, made of wheat and malt flour cooked with cow's milk, was introduced. In the first decade of the twentieth century, raw milk formulas showed up and gained popularity. They were prepared of cow's milk, water, cream, and honey or sugar in specific proportions hoped to approximate the human milk. The first powdered formula came to existence in 1915, whereas evaporated milk formulas made their debut by the late 1930s, their affordability and ease of use made them an attractive option so that their sales surpassed all other formulas in the USA.[12]

Many improvements followed and new ingredients were added to these preparations throughout the mid-1900s paving the road for the formula to become the infants' food of choice in the industrialized world. Unfortunately, the widespread of formula came with a high price, it brought about the less desired effects of shifting from traditional ways of infant care, mostly centered around breastfeeding, to a newer one with formula at its core; these untoward effects encompassed social, financial, and medical ones, most notably was the increased rates of many childhood illnesses including allergies and infections, especially diarrheal diseases and conditions related to the unsanitary preparation methods. Nonetheless, shrinking local markets in the 1960s and 1970s, mainly due to reduced birth rates, led formula companies to boost their marketing efforts in the less-developed world. Aggressive marketing along with legitimate need helped formula to find its way to these new markets, where a sizable segment of the world population resides.

Evolution of Formulas

Creating a formula that delivers most of the benefits of human milk and fixes its deficiencies is an elusive target. Importantly, a milk substitute, be it a nonideal formula, is still in need when breastfeeding is deemed contraindicated. These conditions include some maternal infections (e.g., HIV and Tuberculosis), psychiatric illnesses, malignancies, and the use of cytotoxic drugs. Infant's conditions that preclude successful breastfeeding may include birth defects, inborn errors of metabolism, and the risk of malnutrition among others. Specific financial, societal, and cultural factors may make formula, at times, a more suitable option as well. All of this urged concerned agencies to set standards for acceptable formulas.

The Global Strategy for Infant and Young Child Feeding,[13] published jointly by the WHO and UNICEF, stated that formula should "meet applicable standards recommended by the *Codex Alimentarius* Commission" and cautioned that "lack of breast-feeding, and especially lack of exclusive breastfeeding during the first 6 months of life, are important risk factors for infant and childhood morbidity and mortality." Currently, formulas designed for healthy term infants meet these requirements and are considered a reasonable substitute for human milk. Formulas designed for the preterm infants promise to be not only an acceptable substitute for human milk but also to compensate for its nutritional deficiencies such as low concentrations of protein and calcium.

Human Milk Returns

As formula failed to deliver, a comeback of human milk was certain. This comeback received significant support from many international health authorities such as the WHO which launched jointly with UNICEF the "baby-friendly hospital initiative" (BFHI) in 1991. Later on, this initiative was endorsed by CDC and other governmental agencies. Other groups, however, seemed more coercive and rather ideological in their support. For instance, the La Leche League (a not-for-profit organization) referred to women who chose

not to breastfeed as "bad yuppie mothers"[14] (more information about BFHI on https://www.babyfriendlyusa.org/get-started/the-guidelines-evaluation-criteria).

Certainly, exclusive breastfeeding and "rooming-in" have revealed benefits, but they are not totally risk-free. New evidence suggests that strict adherence to the 10 steps of the BFHI may have contributed to the promotion of potentially dangerous practices, and led to untoward outcomes.[15] Indeed, insisting on full compliance with these steps of the initiative may overwhelm a physically unfit mother and expose the infant to unsafe conditions (co-bedding, soft mattress, and prone positioning).[16] Furthermore, a recent report has described several cases of sudden unexpected postnatal collapse in healthy newborns during early skin-to-skin care. This report is a sobering call for balancing the efforts to promote breastfeeding with the need to implement safe sleep practices.[17]

Human Milk Shortcomings

The recent report by the US Preventive Services Task Force indicated the failure of system-level interventions (such as BFHI) to improve exclusivity or duration of breastfeeding, however, individual-level interventions (such as counseling and education) were more likely to be effective, especially if they were delivered at more than one period (e.g., in both antenatal and postnatal periods).[18] Feeding the preterm infant exclusively with human milk presents another dilemma; despite its better tolerance profile and the role it plays in protection against serious infections and necrotizing enterocolitis, its low concentrations of many nutritional components, such as protein calcium and Vitamin D, make it unwise for use (especially in the case of the extreme preterm infants) without the right amount and type of supplements. The fear that such supplementation would impact breastfeeding duration negatively is unsubstantiated. Indeed, credible evidence indicated that no adverse effect on the duration of breastfeeding was observed when supplementation was given for a medical indication.[19]

Conclusions

Although the universal acceptance of the role that exclusive breastfeeding could play in improving infants' outcomes, the challenge is how to promote it safely. Apparently, there is a need for full compliance with established safe sleep practices while striving to promote breastfeeding. Furthermore, a higher emphasis should be placed on improving current formulas and/or creating new ones so that the nutritional needs of all infants, healthy and nonhealthy alike, can be met.

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