

Short Commentary

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An overview of breastfeeding and how to support breastfeeding

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Abstract

There is absolutely no doubt that breastfeeding is the best nutrition for the baby. In this article, we discuss why breastfeeding is important. With appropriate preparation and support, the majority of mothers can successfully breastfeed their babies. We discuss some important facts about breastmilk composition as well as some practical aspects that would need attention to ensure the mother is supported adequately to ensure a successful breastfeeding experience.

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Introduction

Breastfeeding is the best and most natural feed for the baby. It has all the right ingredients to provide complete nutrition to the growing infant. It is a very effective way to improve child health and even improves survival due to its protective effect against infections. Despite the many benefits, the breastfeeding rate is only around 40% of infants under six months of age [1,2]. In this article, we will discuss some important facts related to breastfeeding and the different factors to consider when we support breastfeeding.

Why is breastfeeding important?

There are many benefits from breastfeeding for both the mother and the infant. Breastmilk is safe, clean, and is instantly available. It meets all the nutritional needs of the infant during the first 6 months of age, and continues to provide more than half the needs for the rest of the first year and even for most of the second year [1,2]. There is a significant financial impact in the form of missing out on intelligence gain as well as economic losses of about \$302 billion annually if not breastfeeding [2].

There is a dynamic nature to breastmilk, with the composition varying according to the infant's needs. It has a protective effect against allergy, and the immune factors in breastmilk protect against gastrointestinal & respiratory infections [1,2]. Brain and vision development has been shown to be better in breastfed babies. There are some long-term benefits like a reduced incidence of obesity & diabetes. This could be due to its effect on intestinal microbiota as well as a lower likelihood of overfeeding in breastfed babies. Maternal health benefits have also received considerable attention in developed countries, including possible protection against breast cancer among premenopausal women, ovarian cancer, and osteoporosis [1,2]. Successful breastfeeding also helps in postpartum weight loss, helps with bonding, and reduces the risk of postpartum depression in the mother.

Composition of breast milk

Breast milk is a complex matrix made up of approximately 87% water, 7% lactose, 3.5% fat, and 1% protein which form the

macronutrients. Human milk oligosaccharides (HMO) also contribute 1.2% [3,4]. These components have no nutritional value but have been in the limelight recently due to their important role as prebiotics in supporting appropriate gut microbiota [5,6]. Breast milk fat provides 50% of the total energy requirement and the lactose content provides close to 40% of the same. The protein is utilized for growth and repair functions mainly. There are many micronutrients in appropriate quantities. The exceptions are vitamin K and vitamin D-which need supplementing (at birth for vitamin K and postnatally for vitamin D). The iron content in breastmilk is low, but since it is very bio-available, it supports the infant well [3,4].

Proteins in breastmilk

There are 2 classes of protein in breast milk: Casein and whey [3,4]. Casein forms curds in the stomach and has an important role in satiety; whereas whey remains as a liquid and is easier to digest. The whey to casein ratio in human milk is 70 to 30 in early lactation and 50/50 in late lactation. As this ratio is reversed in animal milk like cow's milk, these are difficult to digest for babies. The proteins like lactoferrin, lysozyme, Secretory IgA all have a protective role [6]. The protein content in the milk can be quite variable-and the baby can regulate the volume of intake accordingly. This self-regulation is an important benefit of breastfeeding. Protein content in the breast milk of a mother who gives birth to a premature baby is higher, to meet the demands of the preterm baby.

Fats in breast milk

Fats are the most important component of breast milk to supply energy and are very important for the development of the brain. The fats give the milk aroma and taste specific to the baby's own mother. Human breast milk fat content is around 3.5 to 4.5% of fat and 95% of the fat is in the form of triglycerides [4,6]. It also contains essential fatty acids like linoleic acid and alpha-linolenic acid. These can be converted to arachidonic acid, eicosapentaenoic acid & docosahexaenoic acid which are important for regulating growth, immune function, and development of vision, cognitive function, and motor system of newborns [6].

Lactose in breast milk

Lactose, also called milk sugar, is the most abundant carbohydrate component of human milk. Human milk contains approximately 70 g/liter of lactose. Lactose is a disaccharide formed by glucose and galactose which is hydrolyzed by the lactase enzyme. Galactose is a major component of oligosaccharides and it is incorporated in glycolipids and glycoproteins to serve multiple roles in human development including brain growth. The lactose content of human milk is also important in maintaining the constant osmotic pressure of human milk and it helps in the absorption of minerals like calcium. Lactose doesn't stimulate the reward center in the brain compared to glucose/fructose and hence overfeeding is limited. Lactose also acts as a prebiotic when it reaches the colon undigested. Along with HMOs, lactose contributes to the gut microbiota composition, supporting lactobacilli, and bifidobacterium species to predominate in breast-fed infants' gut microbiota [4,8].

The lactase enzyme is naturally up-regulated in the early neonatal period and the majority of babies don't have a problem with lactose intolerance apart from transient discomfort. However, the rate of up-regulation varies and it is better to avoid increasing the volume of feed too rapidly to avoid the symptoms related to lactose intolerance like frothy watery stools, abdominal discomfort and flatulence, and diaper rash. There is absolutely no need to change to lactose-free formula milk, and we should educate the mother to reduce the quantity of milk and modify the pattern of feeding to overcome these symptoms which resolve with time, usually over 2-3 weeks [4,8].

Dynamic nature of breast milk

Breast milk production is very dynamic in nature and it adapts itself as per the changing need of growing infant. Foremilk is thinner and contains more lactose to satisfy the thirst of the baby as compared to hindmilk, which is thicker and contains more fat which supports growth as well as improves satiety. Breast milk produced by the mother at night has more melatonin content, which supports sleep [9] The protein content of the breast milk reduces as the baby grows. During early months of lactation, the protein content of breast milk ranges from 1.4-1.6 gm/100 ml and this reduces to 0.7-1.0 gram/100 ml by 3-8 months of lactation [4]. As discussed earlier, the milk from mothers of preterm babies has higher protein and mineral content. The immune factors in the breastmilk also show a dynamic pattern, supporting and protecting the baby against pathogens against which the mother already has protective immunity [4,5].

Supporting breastfeeding

The mother needs to be taught about the importance of breastfeeding right from the antenatal period. We should clarify any questions she might have and involve her family in the process as well so that they can support her. We should do our best to support breastfeeding in the post-natal period as the first few days are critical in ensuring successful lactation. It is important to detect factors that might affect lactogenesis like maternal anxiety, pain, fatigue, as well as infant factors like tongue-tie, growth-restricted small baby, prematurity, ambient temperature, etc. In general, primigravida mothers and those who faced lactation difficulty in earlier pregnancies, mothers delivering by LSCS or after a complicated delivery process, mothers with illnesses like PIH as well as the group mentioned above need more attention [1,10,11].

Close monitoring during the initial feeding efforts will help ensure an appropriate latch. Once the latch is established, regular stimulation and frequent feeding (once in every 2-3 hours) will help increase the milk output, heralding the start of lactogenesis stage 2. The colostrum that is available during lactogenesis stage 1 is very rich in immune factors, and it is very important for the baby even though the quantity is small [5]. This gradual increase in milk output also helps expand the stomach slowly (as it is very small to start with) and helps with the enzyme up-regulation discussed earlier, improving tolerance.

Where lactation difficulty is expected or perceived, hand expression followed by breast pump use should be taught to the mother, and after each supervised latch, the mother should express milk to empty the breast [1]. Emptying the breast is im-

portant to stimulate further milk production, and unless this is initiated, lactation failure might occur. Supporting the mother's expressing milk as a measure to stimulate lactation can support breastfeeding even in mothers without active problems and can help reduce jaundice and excess weight loss in the infants. Such measures can also be initiated when we notice concerns like excess weight loss or jaundice in the infants, and this would help us avoid using top-up feeds with infant formula.

Monitoring adequacy of breastfeeding

It is very important to make the mother aware that her milk output will be low to start with [1,10], and will increase over 2-4 days. It is also important to reassure her that the baby has mechanisms to cope during this period, and will be healthy. However, we should review the adequacy of feeding and support breastfeeding during this phase. The baby's urine output is initially low with just 1-2 wet nappies seen during the initial two days, and it should start increasing to every 4-6 hours by day 3 onwards. The weight loss that we see during the first few days is related to this as well, and excess weight loss (over 7-8 % by day 2 and over 10% by day 3) is a warning sign. This should prompt us to re-look whether the latch is satisfactory, look for factors like tongue tie, and ensure that the mother empties her breast by pumping till the output and latch/emptying cycle are confirmed. In general, it is adequate to feed the baby for 20-40 minutes per feed every 2-3 hours, and once milk output increases and the baby empties the breast well, babies can sleep longer (4-5 hours after some feeds or even longer as they grow older). Mothers should be educated that keeping the baby on the breast continuously will not increase breastmilk output, and in fact, maybe counter-productive as it leads to sore nipples as well as physical fatigue in the mother and baby. Support as described above is essential in such cases.

Post-discharge follow-up

It is very important to ensure adequate follow-up after discharge-the timing will depend on weight loss as well as the jaundice levels. At the follow-up visit, the weight change (loss or gain), feeding pattern, urine output, jaundice level, and other specific concerns should be addressed.

Conclusion

Nothing in nature will ever match breastfeeding, in terms of complexity and the amazing support it provides to the mother-infant dyad. Even though infant formula milk has improved a lot in the past 3-4 decades, it will never be able to match breastmilk. It is very important that all professionals working with mothers and infants are fully conversant with all these important aspects so they can support the mother appropriately to ensure successful lactation.

References

1. Breastfeeding and the use of human milk. *Pediatrics*. 2012; 129: e827-841.
2. WHO, UNICEF. *Global Strategy for Infant and Young Child Feeding*. Geneva: World Health Organization. 2003.
3. Renfrew MJ. Breastfeeding in the 21st century. *The Lancet*. 2016; 387: 2089.
4. Nommsen LA, Lovelady CA, Heinig MJ, Lonnerdal B, Dewey KG. Determinants of energy, protein, lipid, and lactose concentrations in human milk during the first 12 mo of lactation: the DARLING Study. *The American journal of clinical nutrition*. 1991; 53: 457-465.
5. Olivia B, Morrow AL. Human Milk Composition: Nutrients and Bioactive Factors. *Pediatr Clin North Am*. 2013; 60: 49-74.
6. Valentine CJ, Morrow G, Pennell M, Morrow AL, Hodge A, Haban-Bartz A, et al. Randomized controlled trial of docosahexaenoic acid supplementation in midwestern U.S. human milk donors. *Breastfeed Med* 2013; 8: 86-91.
7. Milani C, Duranti S, Bottacini F, Casey E, et al. The first microbial colonizers of the human gut: composition, activities, and health implications of the infant gut microbiota. *Microbiol Mol Biol* 2017; 81: e00036-17.
8. Kalyanasundaram S, Narayanan VK, Krishnamurthy K. The role of lactose in milk and an overview of intolerance to lactose. *J Pub Health Catalog*. 2021; 4: 300-301
9. Engler AC, Hadash A, Shehadeh N, Pillar G. Breastfeeding may improve nocturnal sleep and reduce infantile colic: Potential role of breast milk melatonin. *Eur J Pediatr*. 2012; 171: 729-732.
10. Lutter CK, Morrow AL. Protection, promotion, and support and global trends in breastfeeding. *Adv Nutr*. 2013; 4: 213-219.
11. Rollins NC, Bhandari N, Hajeebhoy N, et al. Why invest, and what it will take to improve breastfeeding practices?. *Lancet*. 2016; 387: 491-504.