Determinants of Exclusive Breastfeeding Among Nursing Mothers and Adherence of Pediatricians Towards Breastfeeding Guidelines

Thesis

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Presented by

Nermin Rabea Ahmed
(M.B.B.Ch.)
Faculty of Medicine - Ain Shams University

Supervised by

Prof. Dr. Sahar Mohamed Sabbour
Professor of Community, Environmental and Occupational Medicine
Faculty of Medicine - Ain Shams University

Dr. Khaled Mahmoud Abd El-Aziz
Assistant Professor of Community, Environmental and Occupational Medicine
Faculty of Medicine - Ain Shams University

Dr.Ghada Essam El din Amin
Lecturer of Community, Environmental and Occupational Medicine
Faculty of Medicine - Ain Shams University

Faculty of Medicine
Ain Shams University
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Introduction

Breastfeeding provides adequate and essential nutrients for the infant's growth and development, protects infants against infections, and ensures chances of survival. The benefits of breastfeeding, especially exclusive breastfeeding, are well established ***(UNCEF, 2006).***

The World Health Organization (WHO) recommends that children should be exclusively breastfed during the first 6 months of life as breast milk alone is sufficient to meet the nutritional requirements of children until then. To enable mothers to establish and sustain exclusive breastfeeding for 6 months, WHO and UNICEF recommend initiation of breastfeeding within the first hour of life, breastfeeding on demand (that is, as often as the child wants, day and night), and no use of bottles, teats, or pacifiers ***(WHO,1998).***

Exclusive breastfeeding reduces infant mortality related to common childhood illnesses such as diarrhea or pneumonia and helps achieving a quicker recovery during illness ***(Kramer et al, 2001).***

Several studies intended to define determinant variables in the success or failure of breastfeeding, which could ease the planning of promotional strategies ***(Losch et al, 1995).***

Most infants today still do not receive the full benefits of breastfeeding, leaving millions at unnecessary risk of illness and death, and most health workers lack the skills and knowledge needed to help mothers to improve their feeding practices ***(UNCEF, 2006).***

Planning, implementation, and evaluation of programs to promote appropriate infant feeding practices require detailed current information about these practices in the target population.

Aim of the Work

Goal: to promote exclusive breastfeeding among nursing mothers in order to improve infant, child and mother's health.

1. To measure prevalence of exclusive breastfeeding among nursing mothers in first 6 months of life.
2. To determine causes of non- exclusive breastfeeding among nursing mothers in first 6 months of life.
3. To identify opinion and management practices of pediatricians as regard their adherence to breastfeeding guidelines.

Review of Literature

Definition:

Breastfeeding is defined as the feeding of an infant or young child with breast milk including expressed breast milk or from a wet nurse ***(WHO, 2008).***

Exclusive breastfeeding under 6 months of life allow infant to receive Oral Rehydration Salts in addition to vitamin drops or syrup beside breastfeeding ***(WHO, 2007),*** mixed breastfeeding is breastfeeding combined with feeding other fluids, solid foods and/or non-human milk, such as infant formula or animal milks, Partial breastfeeding is a type of mixed feeding where breastfeeding is combined with non-human milk or food based fluid or solid food, an infant who is either predominantly or partially breastfed is considered to be receiving mixed feeding ***(UNHCR, 2009)*** ,predominant breastfeeding allow infant to receive water, water based liquids and fruit juice ***(UNICEF, 2007),*** bottle - feeding means any liquid including breast milk or semi-solid food from a bottle with nipple ***(UNICEF, 2007).***

Weaning is process of introducing the infant to other food and reducing the supply of breast milk; the infant is fully weaned when it no longer receives any breast milk ***(Swagerty, 2002).***

Physiology of Lactation:

At birth, the breast is rudimentary and consists of the tiny nipple from which few ducts radiate ***(Lawrence and Lawrence, 1999).***

At puberty, the breast begins to develop; this development is stimulated by the estrogen of the monthly menstrual cycles that stimulate growth of stromal and ductal systems plus deposition of fat to give mass to the breast ***(Lawrence and Lawrence, 1999).***

At pregnancy, the stages of lactation can be summarized as follows (adapted from Riordan and Auerbach, 1993), ***(Riordan and Auerbach, 1993).***

- Mammogenesis: Mammary (breast) growth occurs. The size and weight of the breast increase.
- Lactogenesis

*Stage 1 (late pregnancy): Alveolar cells are differentiated from secretory cells.

*Stage 2 (day 2 or 3 to day 8 after birth):

The tight junction in the alveolar cell closes. Copious milk secretion begins.

Breasts are full and warm.

Endocrine control switches to autocrine (supply-demand) control.

- Galactopoiesis (later than 9 day after birth to beginning of involution): Established secretion is maintained.

Autocrine system control continues.

- Involution (average 40 d after last breastfeeding): Regular supplementation is added, milk secretion decreases from the buildup of inhibiting peptides.

Lactation

- Two essential hormones (prolactin and oxytocin)

During the second stage of lactogenesis, the breast becomes capable of milk production. For the ongoing synthesis and secretion of human milk, the mammary gland must receive hormonal signals. These signals, which are in direct response to stimulation of the nipple and areola (mammae), are then relayed to the central nervous system. This cyclical process of milk synthesis and secretion is termed lactation. Lactation occurs with the help of 2 hormones, prolactin (PRL) and oxytocin. Although PRL and oxytocin act independently on different cellular receptors, their combined actions are essential for successful lactation.

Prolactin

Milk synthesis occurs in the mammary gland epithelial cells in response to PRL activation of epithelial cell PRL receptors. PRL, a polypeptide hormone synthesized by lactotrophic cells in the anterior pituitary, is similar in structure to placental lactogen (PL), which appear to have cytokine functions. The secretion of PRL appears to be both positively and negatively regulated; however, its main locus of control comes from hypothalamic inhibitory factors, the most important of which is dopamine, acting through the D2 subclass of dopamine receptors present in lactotrophs. PRL stimulates mammary glandular ductal growth and epithelial cell proliferation and induces milk protein synthesis.

Research during the past several decades has led to a deeper understanding of PRL's role in the body. PRL-related knockout models support PRL's pivotal role in lactation and reproduction, which suggests that most of PRL's target tissues are modulated rather than dependent on PRL.

The significance of PRL can be seen in the inhibition of lactogenesis using bromocriptine and other dopamine analogues, which are PRL inhibitors.

Oxytocin

The other important hormone involved in the milk ejection or letdown reflex is oxytocin.

When the neonate is placed at the breast and begins suckling, oxytocin is released. The suckling infant stimulates the touch receptors that are densely located around the nipple and areola. The tactile sensations create impulses that, in turn, activate the dorsal root ganglia via the intercostals nerves number 4, 5 and 6.

These impulses ascend the spinal cord, creating an afferent neuronal pathway to both the paraventricular nuclei of the hypothalamus where oxytocin is synthesized and secreted by the pituitary gland. The stimulation of the nuclei causes the release of oxytocin down the pituitary stalk and into the posterior pituitary gland, where oxytocin is stored.

The infant's suckling creates afferent impulses that stimulate the posterior pituitary gland. This releases oxytocin in a pulsatile fashion to adjacent capillaries, traveling to the mammary myoepithelial cell receptors that, in turn, stimulate the cells to contract.

Oxytocin causes the contraction of the myoepithelial cells that line the ducts of the breast. These smooth muscle–like cells, when stimulated, expel milk from alveoli into ducts and subareolar sinuses that empty through a nipple pore.

Table (i): Composition of human milk

(United Nations University Centre)	
Fat	
Total (g/100 ml)	4.2
Fatty acids – length 8C (%)	Trace
polyunsaturated fatty acids (%)	14
Protein (g/100 ml)	
Total	1.1
casein 0.4	0.3
a-lactalbumin	0.3
lactoferrin (apo-lactoferrin)	0.2
IgA	0.1
IgG	0.001
Lysozyme	0.05
serum albumin	0.05
ß-lactoglobulin	-
Carbohydrate (g/100 ml)	
Lactose	7
Oligosaccharides	0.5
Minerals (g/100 ml)	
Calcium	0.03
Phosphorus	0.014
Sodium	0.015
Potassium	0.055
Chlorine	0.043

The exact integrated properties of breast milk are not entirely understood, but the nutrient content after this period is relatively consistent and draws its ingredients from the mother's

food supply. If that supply is found lacking, content is obtained from the mother's bodily stores. The exact composition of breast milk varies from day to day, depending on food consumption and environment, meaning that the ratio of water to fat fluctuates.

During the first few days after delivery, the breasts produce colostrum. This is a thin yellowish fluid that is the same fluid that sometimes leaks from the breasts during pregnancy. It is rich in protein and antibodies that provide passive immunity to the baby (the baby's immune system is not fully developed at birth).

Colostrum also helps the newborn's digestive system to grow and function properly.

After 3 to 4 days, breasts will begin producing milk that is thin, watery, and sweet. This quenches the baby's thirst and provides the proteins, sugar, and minerals that the baby needs.

Over time, the milk changes and becomes thick and creamy. This satisfies the baby's hunger ***(American College of Obstetricians and Gynecologists, 2006).***

Foremilk, the milk released at the beginning of a feed, is watery, low in fat, and high in carbohydrates relative to the creamier hindmilk, which is released as the feed progresses. The breast can never be truly "emptied," since milk production is a continuous biological process.

The level of Immunoglobulin A (IgA) in breast milk remains high from day 10 until at least 7.5 months post-partum ***(Rechtman et al, 2002).***

The fat fraction contains specific triglycerides of palmitic and oleic acid (O-P-O triglycerides), and also quite a large quantity of lipids with Trans bonds that are considered to have a health benefit ***(Precht et al, 1999; Friesen et al, 2006).***

The principal proteins are casein (homologous to bovine beta-casein), alpha-lactalbumin, lactoferrin (apo-lactoferrin), IgA, lysozyme, and serum albumin.

In an acidic environment such as the stomach, alpha lactalbumin unfolds into a different form and binds oleic acid to form a complex called HAMLET that kills tumor cells.

This is thought to contribute to the protection of breastfed babies against cancer ***(Svanborg et al, 2003).***

Non-protein nitrogen-containing compounds, making up 25% of the milk's nitrogen, include urea, uric acid, creatine, creatinine, amino acids, andnucleotides ***(Thorell et al, 1996).***

Breast milk has circadian variations; some of the nucleotides are more commonly produced during the night, others during the day ***(Sanchez et al, 2009).***

Mother's milk has been shown to supply a type of endocannabinoid (the natural neurotransmitters that marijuana simulates), 2-Arachidonoyl glycerol ***(Fride et al, 2005).***

The breast milk of diabetic mothers has been shown to have a different composition from that of non-diabetic mothers. It may contain elevated levels of glucose and insulin and decreased polyunsaturated fatty acids. A dose-dependent effect of diabetic breast milk on increasing language delays in infants has also been noted, although doctors recommend that diabetic mothers breastfeed despite this potential risk ***(Rodekamp et al, 2006).***

Though it now is almost universally prescribed, in some countries in the 1950s the practice of breastfeeding went through a period where it was out of vogue and the use of infant formula was considered superior to breast milk. However, it is now universally recognized that there is no commercial formula that can equal breast milk.

In addition to the appropriate amounts of carbohydrate, protein, and fat, breast milk provides vitamins, minerals, digestive enzymes, and hormones. Breast milk also contains antibodies and lymphocytes from the mother that help the baby resist infections.

The immune function of breast milk is individualized, as the mother, through her touching and taking care of the baby,

comes into contact with pathogens that colonize the baby, and, as a consequence, her body makes the appropriate antibodies and immune cells.

This is the reason why breast milk contains very little iron, as iron is an essential precursor to the activation of micro-bacteria and gut flora; providing iron in the milk would lead to infection.

However, the internal iron supplies of the infant, held in the hepatic cells of the liver, are exhausted at 4-6 months, hence this is the time that complementary feeding is introduced, as to prevent anemia and this go with *recommendation of WHO.*

Nursing mothers should consult with their physician regarding substances that can be unwittingly passed to the infant via breast milk, such as alcohol, viruses (HIV) or medications.

So Human milk, in addition to its numerous nutrients that make it an ideal food source for the growing term infant, is a bioactive fluid that evolves from colostrum to mature milk as the infant matures. This bioactive fluid contains numerous factors and live cells that, in concert, promote the growth and well-being of the breastfeeding infant. Oliver Wendell Holmes said it best when he stated, "A pair of substantial mammary glands has the advantage over the two hemispheres of the most learned professor's brain, in the art of compounding a nutritious

fluid for infants." With the ever-expanding knowledge resulting from current research, commercial formula clearly cannot replicate all of the valuable properties that are inherent in human milk.

First year feeding

The average breastfed baby doubles its birth weight in 5-6 months. By one year, a typical breastfed baby will weigh about 2½ times its birth weight. At one year, breastfed babies tend to be leaner than formula fed babies, which is healthier, especially in the long-run ***(Sears, 2007).***