

Special Article – Breastfeeding

Breastfeeding: Yesterday, Today and Tomorrow

Tiwari S*

CCC Member of BPNI, IBCLC- International Board Certified Lactation Consultant, USA

***Corresponding author:** Satish Tiwari, Ex- Professor of Pediatrics, Govt. Medical College Akola, India, Editor, Text Book on Medico-legal Issues, Founder President, Indian Medico-legal and Ethics Association, Founder Convener, Human Milk Banking Association (of India), Founder Secretary IYCF chapter of IAP, CCC member of BPNI, 06-08, IBCLC, International Board Certified Lactation Consultant (09-14), USA

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Abstract

Breastfeeding is ancient art practiced for many centuries. Suboptimal feeding practices either due to lack of knowledge, skills, or lack of resources can permanently damage a child's growth and development. Breastfeeding is natural, instinctive and physiological process. Human milk has widely acknowledged benefits across economic strata with respect to infant nutrition, gastrointestinal function, host defense, neurodevelopment, psychological well-being for full-term and premature infants. The method of "Breast Crawl" can be adopted for early initiation. If breastfeeding was temporarily discontinued due to an inadvertent situation, "re-lactation" should be tried as soon as possible. The possibility of "induced lactation" shall be explored according to the situation e.g. Adoption, Surrogacy. The best position for feeding is one which suits both the mother and baby. Kangaroo Mother Care is a simple way of caring preterm and low birth weight babies. Breastfeeding should be on cues. If the goal is to achieve sustainable goals mother's milk is indispensable for baby. Presence of human milk banks in NICUs is associated with elevated exclusive breast feeding rates in VLBW babies. The online breast milk business is becoming more and more lucrative, despite health warnings like infections, contamination and misrepresentation. The breast milk is also one of the excellent sources of stem cells. Mothers should feel comfortable to nurse in public. All efforts should be taken to remove hurdles demeaning breastfeeding in public places. We should take a pledge today that we will not waste any opportunity to protect, promote and support proper breastfeeding practices.

Keywords: Breastfeeding; Wet nursing; Human milk banks; Re-lactation; Induced lactation; Feeding cues; Protest Feeding

Introduction

The practice of breastfeeding is probably as old as human evolution and civilization. According to theory of evolution, the mammals have evolved from a unicellular organism. Mammals gradually evolved during the Triassic period to the present race of human beings. The word mammal is derived from "Mamma" which means animals having "Mammary glands". The mammary glands have the role and function of breastfeeding the off-springs. Breastfeeding is thus an ancient art practiced by many throughout human history from generation to generation. A civilization's progress is reflected in the status of its weakest sections. Children are among the weakest and most vulnerable sections of a society. They depend almost entirely on adults for all their needs including nutrition, growth and development. Suboptimal feeding practices either due to lack of knowledge, skills or lack of resources can permanently damage a child's growth and development. However, in many societies a mind-numbing myriad of suboptimal wrong feeding practices and misconceptions or taboos exist even as world enters the new millennium [1].

Why Breastfeeding

A healthy and normal growth requires good nutrition. Food or nutrition is one of the most basic human rights. Every individual deserves a healthy start to his/her life. Newborns, infants, and children have a passive role in food and nutrition and depend on parents or caregivers for this most basic need [2]. Breastfeeding is birth-right of each and every newborn child as well as mother.

These rights are preserved by various enactments, declarations, Acts or laws in different countries. These rights are protected under the Constitution of India in the Article 47. These rights are also protected under Convention on the Rights of Child 1989, Innocenti Declaration 1990, International Code 1981, ILO convention 2000, IMS Act 1993 as amended in 2003 and various World Health Assembly (WHA) resolutions declared from time to time.

Breastfeeding is natural, instinctive and physiological process. The human milk must be provided to those children who are compromised or in vulnerable state of health because of their nutrition and body needs.

Human milk has widely acknowledged benefits across economic strata with respect to infant nutrition, gastrointestinal function, host defense, neurodevelopment and psychological well-being for full-term and premature infants. Term infants rapidly adapt from a relatively constant intrauterine supply of nutrients to intermittent feedings of milk. Preterm infants, however, are at increased risk of potential nutritional compromise. These infants are born with limited nutrient reserves, immature metabolic pathways, and increased nutrient demands [3]. (The details or long list of common and well-known benefits are not included in this section for paucity of space).

According to WHO, the choice of feeding is direct at mother's breast, if not possible then expressed MOM (Mother's Own Milk), then donated fresh milk, then pasteurized donated human milk and lastly other animal milk.

The Science of Breastfeeding

The breast milk is “species specific” as well as “gestation specific” in fact it is “tailor-made” as per the needs of newborn. The milk coming out in the beginning, otherwise known as “Foremilk” or “Hindmilk” which comes at the end of feed, both have scientific reasons. The extremes of maternal nutritional status are likely to adversely affect the fetus. These may result in fetal mal-development, fetal death, un-timely termination of pregnancy, intrauterine growth retardation. The first two years of life and nine months in utero, the so called “1000 days” to prevent child malnutrition are the critical window period for action [4]. If we want to improve health of our future generation there is urgent need to look into the nutrition and feeding of children. Initiate breastfeeding within first hour of birth i.e. “Golden hour” [5]. For all normal newborns (*including those by caesarean section*) skin-to-skin contact should be initiated in about 5 minutes of birth in order that baby initiates breastfeeding in an hour of birth. The method of “Breast Crawl” (www.breastcrawl.org) can be adopted for early initiation [6].

Breastfeeding is best method of infant feeding, because human milk continues to be only milk which is uniquely suited to human infant. Breast-milk has been equated to blood and has been rightly termed as “white blood”. Because of immunological advantages of mother’s milk it is not only considered as white blood but it is also supposed to be “First Vaccine” for a newborn. The Immunoglobulins (IgA, IgG, IgM) in breast milk or Colostrum prevents intestinal and respiratory infections in baby. The cells like Macrophages, Lymphocytes and Polymorphs along-with Compliment activators of C3, C4 are supposed to decrease incidences of many infections. The Lysozymes, Lactoferrin and Lactoperoxidase help by destroying the micro-organisms. There are specific inhibitors in form of Antiviral, Anti-staphylococcus factors. There are growth factors for *Lactobacillus Bifidus* (Prevents intestinal infections) and Para Amino Benzoic Acid (PABA) which protects against malaria. The antibodies are passed trans-placentally from mother to baby in the last trimester. Hence preterm babies will have low levels of antibodies (More the prematurity- lesser the antibody titers). Mother’s milk in preterm babies helps in preventing the infection because of its anti-infective properties and higher antibody contents.

Breastfeeding was consistently associated with higher performance in intelligence tests in children and adolescents, with a pooled increase of Intelligence Quotient (IQ) points. A large randomized trial reported an increase of more than 7 IQ points at 6.5 years of age. A study in Brazil including 30 years of follow-up suggested an effect of breastfeeding on intelligence, attained schooling and adult earnings, with 72% of the effect of breastfeeding on income explained by the increase in IQ [7].

The Holistic or Spiritual Aspect

The Indian mythology is full of Holistic or Spiritual importance of mother’s milk. Mother and baby are always considered as a single unit. This bond between mother and child continues not only throughout antenatal period but even after the birth of child. Many consider breastfeeding as “Fourth Stage” of labor or delivery. It is well accepted, that any effect on health of mother is going to affect the health of fetus. The way in which mother thinks, feels,

eats, listens, sees or behaves (“GarbhSanskar”) are all reflected in baby. Ancient Indian literature is full of such stories. In, the epic “Mahabharata”, Abhimanyu’s learning, how to enter “Chakravayuh” is one such example. The concept of ‘Wet nursing’ is not new in Indian mythology or history. Mother Yashoda has probably nursed and fed Lord Krishna while PannaDhay has saved Udaysingh at the cost of her own son. The history of Rajasthan and many parts of India are well known for wet-nursing.

Appropriate nutritional practices play a pivotal role in determining health and development of children. It is responsible not only for physical health but also mental, psychological, emotional, social and even spiritual health. UNICEF uses a comprehensive definition of Early Childhood Development (ECD), and focuses on five domains of physical, emotional, social, cognitive and communication development [8].

The Myths and Misconceptions

Though breastfeeding is natural there are many myths and misconceptions related to it. One of the misconceptions is that breastfeeding may result in altering of body figure of the women; while the actual fact is that breastfeeding helps in restoration or regaining the figure by utilizing the fat that was deposited during pregnancy.

Another myth is, breast milk secretion is related to size of the breasts; smaller the breast lesser the milk secretion. The actual fact is that the size of breast depends on adipose tissue, while milk secretion depends on secretory tissue and the hormonal balance. The breast size varies due to differences in amount of fat. Amount of milk producing glandular tissue is almost same in all mothers.

Is Breast Milk Adequate?

One of the important misconceptions is baby is not getting adequate milk and is crying excessively as she is hungry. In fact the adequacy of breast milk is judged by frequency of urination (More than six times in twenty four hours) and amount of weight gain (approximately five hundred grams per month in first six months). It is necessary to feed the baby more frequently during first seven days (at least 8-10 times in 24 hours). In this period baby should be breastfed every 1.5-2 hours by giving close skin-to-skin contact. Only after child starts urinating frequently (more than 6 times in 24 hours.) and starts gaining weight then the baby can be fed on demand or whenever baby wants and as long as she want [9]. Very few babies demand feeds with a regularity of 2-3 hours. Some sleep during day and keep their mothers awake at night. Some have exactly opposite schedule. Some children do not follow any definite timetable. Some babies sleep for a long time and then after waking up feed very frequently and also urinate frequently. All these patterns should be considered as normal. The mothers should adjust her daily routine to suit baby’s needs. Some babies are fast feeders (finishing their breastfeed in 5 to 10 min.), while slow feeders may continue to suckle as long as 30 to 45 min.

Re-lactation and Induced Lactation [10]

Breastfeeding may be discontinued due to inadvertent situations like neonatal jaundice, perceived low milk output, significant maternal illness, temporary or short term contraindications and some of the myths or misconceptions. In such cases “re-lactation” should

be tried as soon as possible [11]. Supplemental Suckling Technique (SST) is a technique which can be used as a strategy to initiate re-lactation in mothers who have developed lactation failure or Mother's Milk Insufficiency (MMI). WHO recommends re-lactation through Supplemental Suckling technique. The drip and drop method helps to sustain infant's interest of suckling at breast [12].

The possibility of "induced lactation" shall be explored according to situation for instance Adoption, Surrogacy. It helps to create mother-infant bonding apart from security and comfort for baby. The technique involves motivating the surrogate mother, having a willing and vigorously sucking infant and an adequate support group. Prolactin and oxytocin, the hormones which govern lactation, are pituitary and not ovarian. Hence, stimulation of nipple and areola and repeated suckling by baby are important. Lact-aid as nursing trainer is also useful [13]. A course of prolactin enhancing drugs such as Metoclopramide or Domperidone is initiated [14]. Non-puerperal lactation in surrogate mothers has been successfully demonstrated among Indian mothers [15].

The Positioning

The position of mother and child during breastfeeding is very important. The best position is one which suits both mother and baby and the dyad is comfortable. A proper position makes feeding very easy and painless event. If the position is not proper it can result in sore/ cracked nipples, fullness, engorgement and ultimately breast abscess. The position should be observed on few occasions at least in primipara mother. To avoid cracked/sore nipples mother should learn proper technique of attachment right from first breastfeed. Ensuring that mother does not feel pain while feeding confirms good attachment. Breastfeeding twins are easier to manage than bottle feeding twins, if breastfeeding is going well. This is why it is so important that a special effort should be made to get breastfeeding started right when the mother has had twins. Mother needs help to find best way to hold two babies to suckle, either at same time, or one at a time. Holding one or both babies in the underarm position (Football position) for feeding, and support for babies with pillows or folded clothes is often helpful. Building mother's confidence that she can make enough milk for two and encouraging relatives to help with other household duties may help her to avoid trying to feed the babies artificially. Many women have breastfed triplets exclusively. This obviously takes a lot of work and time.

Kangaroo Mother Care

Kangaroo Mother Care (KMC) is a simple way of caring preterm and low birth weight babies. This helps by maintaining temperature by providing skin-to-skin contact with mother or family members and supporting frequent breastfeeding. This also prevents infections and other complications. KMC can be continuous KMC (C-KMC), 24 hours a day or intermittent KMC (I-KMC) for short periods once or a few times per day. This method has grown in acceptance as a way of dealing with inadequate and insufficient incubator care for very small preterm and low birth weight (LBW) [16]. It enhances bonding, early establishment of breastfeeding and increases duration of exclusive breastfeeding. The benefits of KMC are easy acceptability by mothers and healthcare staffs as it has good long term outcome in survival and early hospital discharge of these babies.

Kangaroo Care, Bedding in or skin to skin contact promotes establishing the gut and skin microbiota. Delivery mode initially established whether the gut flora of the mother (vaginal delivery) or the skin flora of the birth attendants (caesarean section) dominates the initial colonizers, which induce an important immune response in infant. Feeding mode is the second fundamental determinant of infant microbiome. Breastfed infants maintain persistent microbial differences, independent of delivery mode, owing to the effects of Human Milk Oligosaccharides (HMOs). Substantial inter-individual variation exists in maternal HMO production, which in turn underpins the pattern of flora acquisition by infant [17]. Therefore, there is specificity of the interaction between breast milk and infant microbiome, causing different bacterially induced effects on infant's metabolism and immunity.

The Feeding Cues

In previous few decades there were many debates or discussions regarding the feeding schedule. Some advocated fixed schedule while others believed in demand schedule. It is now well accepted that feeding should be on cues. "Early Feeding Cues" are sucking movements and Sucking Sounds, Hand to Mouth movements, Rapid eye movements, soft cooing or sighing sounds and restlessness. If the infant is not aroused remove blankets, clothing, change diaper, place infant in skin to skin contact and massage infants back or abdomen. Crying is a late feeding cue and may interfere with feeding [18].

Problems during Breastfeeding

If proper care is not taken problems may develop both in babies as well as mother. It is important to detect and solve these problems at the earliest so that breastfeeding doesn't suffer in future. Wide spectrum of problems may arise from mild to severe like simple engorgement to breast abscess. Early diagnosis and prompt treatment helps in resolving the issues without long term complications. (The details of problems, complications are beyond the purview of this article).

Are there any Contraindications

There may be many contraindications for breastfeeding, but most of these are relative, for short duration or temporary. There are no absolute contraindications except some metabolic disorders like Galactosemia, Phenylketonuria and anti-malignant or radioactive drugs. The HIV or AIDS is also not considered as absolute contraindication. In fact in many developing countries Exclusive Breastfeeding (EBF) for first six months is recommended because of its numerous advantages. (The details are not discussed because of constraint of space).

Human Milk Banks

21st century has re-discovered the benefits and advantages of mother's milk for the optimal growth and development of child. If we want to achieve sustainable developmental goals, mother's milk is indispensable for baby. This resulted in exploring of human milk banks all over the world. The disadvantages of formula or artificial feeding are gradually becoming scientifically evident and hence need of the hour is "Human Milk Banks" (HMB). HMBs play a life-saving role by helping babies receive benefits of early initiation and exclusive feeding of mother's milk. Human milk banks are primarily focused to

provide donor milk to high risk newborns admitted in neonatal unit. Breast milk is of special importance for sick preterm and LBW infants who are admitted to N.I.C.U [19,20]. Presence of human milk banks in NICUs is associated with elevated rates of exclusive breast feeding rates in VLBW babies [21]. Most of the dangers of transmitting infections and toxins to recipients by donated breast milk are evaded by using Mother's own Milk. Mother with Hepatitis-B or CMV can continue breastfeeding own child. Most often breastfeeding by own child is not contraindicated except for certain maternal medications, rare neonatal metabolic disorders and nipple-areola infections. Risk of unpasteurized donor human milk is probably overrated. Donated raw milk given to newborn infants produces no ill effects including HIV transmission, as observed over many years and still practiced in Norway milk banks [22] where donors are screened regularly, strict protocol is followed and all milk is microbiologically tested. The risk is very minimal especially if donation is voluntary and is from within the known community.

The government and policy makers have acknowledged role of HMB in reducing neonatal mortality and morbidity. In India, Rajasthan State Government is promoting and supporting the "AmrutKaksh" (a special room for breastfeeding near delivery area) and HMB at district places on priority basis.

Commerce of Breast Milk

There are numerous advantages of breastfeeding. Because of this there is every possibility of selling the human milk in order to make enormous money. It could trade for 400 times more than price of crude oil and 2,000 times more than iron ore [23]. Going for as much as \$4 per ounce, breast milk is a hot commodity that is emerging as a surprisingly cut-throat industry, one that states are seeking to regulate amid a battle for control between nonprofit and for-profit banks that supply hospital neonatal units.

The for-profit companies offer moms the chance to earn \$1 an ounce to \$2.50 an ounce for their milk. The companies say that mothers have a right to earn money for their milk [24,25].

The proposal is to provide breast milk, collected free from mothers, at no cost to sick and pre-term babies in the hospital itself. But it would also allow the company to sell it to other needy babies across the State at Rs. 300 for 15 ml. A company in India has submitted a proposal, according to which collected milk will be transported to a "pharmaceutical grade" facility where it will be processed and stored [26]. "The company has submitted a proposal seeking permission to collaborate for setting up a human breast milk bank". Breastfeeding advocates and doctors termed the suggestion 'commercialization and exploitation of poor mothers.' They have questioned need for commercialization of breast milk when every woman can secrete adequate quantity to feed two babies. "The only way a poor woman can nourish her baby is through her own breast milk. If there is a market, she may sell it and make her baby a victim of malnutrition".

The online breast milk business is becoming more and more lucrative, despite health warnings [27]. Human breast milk being bought online by fetishists, bodybuilders and cancer patients is a danger to health, UK researchers say [28]. While breast milk is optimal nutrition for infants, adult don't get the benefits and might be risking their health. In a study, the Queen Mary University of London

team claimed the milk was unpasteurized and could carry dangerous germs. They said claims that the milk boosted the immune system were misleading and could be dangerous to cancer patients. It says 93% of breast milk sold online contains detectable levels of bacteria, as non-sterile equipment is used to express or store the milk. Threats include hepatitis B and C, HIV and syphilis."It is advertised with an immune benefit, but actually it poses real risks, and you're exposing yourself to bacteria and viruses that could complicate medical condition in a dangerous way."

The breast milk is also supposed to be one of the excellent sources of stem cells [29]. Stem cells can be sourced from breast milk and have potential to help people suffering from debilitating diseases such as Parkinson's and diabetes. The benefit of obtaining stem cells from breast milk is that they can be accessed non-invasively, unlike getting them from bone marrow, umbilical cord blood or peripheral blood.

Legal and Ethical Issues

The gender discrimination and exploitation of mother and misuse of human milk must be prevented at all cost. It is important to support a woman in workplace, so that she can successfully breastfed her baby. WHA resolution 45.34 (14th May 1992) expressed its concern about need to protect and support women in workplace, for their own sake but also in the light of their multiple roles as mothers and care-providers, *inter alia*; by applying existing legislation fully for maternity protection, expanding it to cover any women at present excluded or, where appropriate, adopting new measures to protect breastfeeding. As an increasing number of women are now working outside the home due to better education and economic needs, countries needs to legislate for adequate maternity leave. There are lots of discrepancies and variations in provisions of maternity leave between various states and national governments. It has been suggested that a minimum of six months paid maternity leave should be granted so that mother can exclusively breastfed her baby for the first six months. Similarly there should be provisions for paternity leave so that father may help in some important decisions, which are to be taken in post-natal periods. The Supreme Court of India, recently held that a woman employee of central government can get uninterrupted leave for two years for childcare, which also includes needs like examination and sickness [30].

The animal or formula milk is not suited for most of babies and results in various health hazards. It not only endangers physical growth and developments but also results in impaired cognitive, emotional and intellectual development. Sometimes it may also result in many allergic disorders. Still, unregulated and uncontrolled use of animal or formula milk continues in our society endangering the health of future generation. The public and professional concern over the deteriorating situation resulted in WHO and UNICEF organizing an International meet on Infant and Young Child Feeding (IYCF) in 1979. In this meeting it was decided that there is a need for Code to control inappropriate marketing practices. After several discussions and consultations, a final Code was drafted in 1981 and approved by WHA in 1981 by 118 votes to 1 (United State not voting in favor). Thus, the *International Code* is one of the powerful tools, which was developed after a long campaign and discussions by public pressure groups [31].

International Code was the first of its kind, an internationally adopted and endorsed basic minimum requirement to protect healthy practices in respect of infant and young child feeding. In 1982, Peru became first country to adopt the *International Code* as national legislation. Till today, many countries have enacted the full *Code* as law [32].

The online trade of breast milk has raised many ethical and legal issues. Recipient infants risk the possibility of consuming contaminated or adulterated milk. A study was conducted to test milk advertised for sale online as human milk to verify its human origin and to rule out contamination with cow's milk [33]. Online trade results in dangers of donated or purchased breast milk like exposure to infectious diseases, contamination with chemical or drugs and mis-representation. Hence proper screening is needed for online purchase of human milk.

Protest Feeding

In last few years the modern mothers have realized that giving the best start in life to baby is their birth right. Hence many mothers have now started Feeding in Public (FIP) places. Naturally, there was objection to these feeding practices by those who believe that the women breast is sex organ and there shall not be any exposure as this promotes indecency. The believers of human rights have totally rejected this moral policing and started breastfeeding their babies in public places. All efforts should be taken to remove hurdles demeaning breastfeeding in public places, hotels, restaurants; special areas/ rooms shall be identified/ constructed or established in places like Bus stands, Railway stations, Air ports.

Recently, dozens of breastfeeding mothers have taken over a Bendigo shopping centre food court, in Australia protesting against the eviction of a mother who was ordered to leave after customers complained [34]. In, Budapest Hungry, McDonalds restaurant manager refused to grant permission to breastfed the baby. The mother informed her friends on social media and within short time many of them gathered in restaurant and started breastfeeding their babies in protest. This mode of "Protest breastfeeding" seems to be a novel approach or way to promote breastfeeding and to highlight the Mother and Child right issues in 21st Century.

Conclusion

The human milk or breast milk must be provided to those children who are compromised or in vulnerable state of health because of their nutrition and body needs. In many third world countries, there is a lack of political will and commitment to safeguard children's rights related to food and nutrition. Children are often silent sufferers and victims of political, economic, cultural, religious, and environmental discrimination. The recent intensive efforts for improving child survival status and global concerns for child's health has drawn attention of researchers, national policy makers and administrators on impact of maternal nutritional status on fetal and neonatal health and outcome. There is need to ensure that all babies receive human milk exclusively for six months and then extended for two years along with proper complementary feeding. All stakeholders and policy makers must come up with a coordinated, well planned program and policies as per the rights of mother and child. As a "Custodian" of health of future generation we have right to make

our policy on vision of promoting and protecting infant and child nutrition. Optimal infant and young child feeding practices rank among the most effective interventions to improve child health. Appropriate nutritional practices play a pivotal role in determining growth and development of children. It is duty of every nation to look after the children—who are indeed nation's assets—and to ensure full development of their personalities. But empty words without action are of no help. Many times we only remember and follow the words and forget the spirit behind the issues. We should take a pledge today that we will not waste any opportunity to protect, promote and support proper breastfeeding practices. The time has come to create a system of world governance and fulfill our moral and constitutional responsibilities, safeguard the future of not only our children but also the generations yet-to-be-born, take decisive action and lead now before it is too late.

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