

Banking on ‘Liquid Gold’: How Breast Milk Banks are Saving Infant Lives

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Abstract: *Breast feeding is not a choice, it's a responsibility. "Breastfeeding is nature's health plan." breast milk considered to be 'liquid gold' Breast milk is a perfectly balanced source of nutrition. Human milk provides all the essential components for the growth and development of the baby. Human milk also provides vital protection, decreasing infection via immunoglobulin and anti-infective proteins. It is therefore recommended as the sole source of nutrition for all babies during the first six months of life, with continued breastfeeding in addition to solid foods for at least the first years. There is no finer investment for any community than feeding the babies on breast milk. According to a joint statement made by the WHO and UNICEF "The best food for baby who cannot be breastfed is milk expressed from the mother's breast or from any other healthy mother". Banked human milk may be a suitable feeding alternative for infants whose mothers are unable or unwilling to provide their own milk.*

Keywords: Human milk bank, Liquid gold, Banking

1. Definition

A human milk bank is a service established for collecting, screening, processing, storing and distributing donated human milk.

2. History

Donating breast milk can be traced back to the practice of wet nursing. The first human milk bank was founded in 1909 in Vienna, Austria. Wet nursing was widely practiced in Europe during the 19th century in order to provide human milk for infants whose mothers were unable to provide milk for their infants. However, wet nurses were not always available or, when available, pursued unhealthy lifestyles or carried infections that could be transmitted through milk. An alternative to wet nursing was found in human milk banking.

Shortly after Vienna, the first milk bank opened in the United States in the Boston Floating Hospital and many others followed all over the world. In the 1960s, efforts in human milk banking faded due to advances in neonatal medical care and infant nutrition, mainly the development of high-quality infant formulas. In the 1980s, the new infectious disease, HIV, arrived. As it is transmissible through breast milk, this led to the closing of many milk banks. Once disease transmission via human milk was recognized as a health hazard, serological testing of the mother became necessary. The added financial burden drove some milk banks out of business. Appropriate screening of donating mothers as well as adherence to standards of procedure has reversed that trend since the early 2000s.

Milk banking activity varies greatly between different parts of the world due to a variety of reasons: sometimes the reasons have to do with economics and funding, and sometimes they are linked to religious and cultural factors. Globally, there is an increase of interest in milk banking all over the world.

Currently there is a move to open many milk banks in India and other Asian countries such as Vietnam, China, and Japan. The increase of interest goes along with the

recommendations of large pediatric societies, such as ABM, ESPHGAN, and AAP, to promote human milk feeding in premature infants. All guidelines say that the mother's own milk is the first choice for an infant. However, if the mother's own milk is not available, donor milk is the recommended alternative. A further important recommendation is that donor human milk should be provided by an established human milk bank that follows standard safety guidelines.

Human milk bank in India

India faces its own unique challenges, having the highest number of low birth weight babies, and significant mortality and morbidity in very low birth weight (VLBW) population.

In our country, the burden of low birth weight babies in various hospitals is about 20% with significant mortality and morbidities. Feeding these babies with breast milk can significantly reduce the risk of infections. The first milk bank in Asia under the name of Sneha, founded by Dr. Armeda Fernandez, was started in Dharavi, Mumbai on November 27, 1989.

Currently, the number of human milk banks (HMB) has grown to nearly 14 all over India but the growth of human milk banks has been very slow as compared to the growth of neonatal intensive care units.

One of the major reasons for loss of interest in human milk banking was the promotion of formula milk by the industry.

Keeping in mind the complications associated with formula feeding to the sick, tiny preterm neonates and mothers' inability to breastfeed in the initial period, there is a need to establish human milk banks in all level II and level III facilities. In Uttar Pradesh first Human milk bank started at KGMU (King George's Medical University), Lucknow.

Human Milk Bank – The need

- 10,000 -12000 deliveries / year
- Over 60% High risk Deliveries
- 2500 – 3000 babies transferred for intensive care
- LBW babies over 60%

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- High mortality rates - over 60% related to infection

Objectives of the Milk Bank

- To ensure that every baby born or admitted to the hospital receives mother's milk
- To avoid bottle, animal & formula milk
- To heighten breast feeding awareness
- Ancillary support to breast feeding practices
- To promote Baby Friendly Hospital care

Location of human milk banks

Human milk banks are primarily focused to provide donor milk to high risk newborns admitted in the neonatal unit. Therefore, a location in close proximity or even inside the boundaries of neonatal unit is desirable. This also helps in administrative supervision by medical staff.

Presence of human milk banks in the **neonatal units** is associated with elevated rates of exclusive breastfeeding rates in VLBW babies.

Postnatal wards or Well Baby clinics of large hospitals are most suited for the purpose as donors are likely to be found in large numbers where medical and nursing staffs can encourage them to donate milk.

Certain **non-government organizations (NGOs)** taking care of abandoned babies can also have a human milk bank in their facility.

The recipients

- Absent or insufficient lactation: Mothers with multiple births, who cannot secrete adequate breast milk for their neonates initially.
- For babies of non-lactating mothers, who adopt neonates and if induced lactation is not possible
- Abandoned neonates and sick neonates.
- Temporary interruption of breastfeeding.
- Infant at health risk from breast milk of the biological mother.
- Babies whose mother died in the immediate postpartum period

Who can donate?

- Mothers with surplus milk without infection (HIV, Hep B, C, Syphilis, Tuberculosis)
- Mothers of premature, sick or cleft lip babies
- Mothers who have recently lost their babies
- Donors willing to undergo a medical test & a blood test at the milk banks expense to ensure a medical safety.

Equipments

- Pasteurizer/Shaker-water bath
- Deep freezer
- Refrigerators
- Hot air oven/Autoclave
- Breast milk pumps
- Containers
- Generator/Uninterrupted power supply
- Milk analyzer

Administrative staff

- **Director** (for planning, implementing and evaluating the services)
- **Milk bank officer** (usually a doctor, for day-to-day running of the bank and training)
- **Lactation management nurse** (for counseling mothers and assisting expression of breast milk),
- **Milk bank technician** (for pasteurization of breast milk and microbiological surveillance)
- **Milk bank attendant** (for collecting, sterilization of the containers and maintaining hygiene),
- **Receptionist** (for record keeping and public relations)
- **Microbiologist** (for microbiology testing and infection control policies).

Collection of breast milk

After proper counseling, checking suitability for donation, getting written informed consent, history taking, physical examination and sampling for laboratory tests, the donor is sent to designated breast milk collection area in the milk bank or in the milk collection center.

- Breast milk is collected by trained staff with hygienic precautions, after method of breast milk expression is chosen by the donor.
- Home collection of breast milk is better avoided at present in our country due of the risk of contamination.
- Washing the breast with water before expression is as good as washing with disinfectant.
- There is no rationale in discarding foremilk.
- Drip milk (the milk that drips from the non-feeding breast in some of lactating mothers) collected with the help of breast milk shells has been found to be nutritionally inferior with lower fat content, and is not recommended for banking.
- The breast milk may be expressed manually (hand expression) or with breast pumps.
- Manual expression is a low cost and effective method of expression, and associated with less risk of contamination.
- Simultaneous breast expression in breastfeeding women is more efficacious than sequential breast expression.
- Milk should be collected in properly labeled sterile container and transported to HMB under cold storage condition.

Processing

All batches of collected raw breast milk should be refrigerated immediately till the serological report comes negative. Fresh raw milk should not be added to the frozen milk. Before pasteurization, pooling and mixing may be carried out from multiple donors to ease the process of processing and storage.

Pasteurization is carried out by Holder's method.

Microbiological screening of donor milk is done before and after pasteurization

Holder Pasteurization of Milk

As per recommendations of HMBANA:

- Pasteurized at 62.5 deg C for 30 min in shaker water bath
- Preserve >80 % of immunological factors, destroying 99% of pathogens including HIV virus

Storage

Pasteurized milk awaiting culture report should be kept in dedicated freezer/freezer area taking precaution not to disburse it till the culture is negative. Storage should be done in the same container that is used for pasteurization.

Storage of Heat Treated Milk

- Stored in the freezer at -20 degrees C
- Pasteurized milk can be stored for 6 months
- Freezer compartment of fridge for 48 hours
- Room temp: 6-8 hours

Disbursal

PDHM should be disbursed at physician's requisition from NICU Physician after informed consent from the parents of the recipient.

- First in first out" basis
- Milk shifted to fridge in neonatal unit as per need
- Milk thawed by standing container in lukewarm water
- Use thawed milk within 4-6hrs

Benefits - Human Milk Banking

- Ensures continuous supply of safe human milk for sick and preterm babies
- Reduces infection rates in hospitalized babies
- Frequent expression helps maintain lactation
- Reduction in long term morbidity and mortality
- Positive influence on breast feeding practices in hospital and community

3. Conclusion

It is clear that artificial formula will never provide the broad range of benefits of human milk. So

- A breast milk bank is a feasible project
- A Breast Milk Bank ensures that every baby receives breast milk while in hospital
- Milk is bacteriologically safe
- Serves as a reservoir for human milk
- Every hospital with a large NICU must have a HMB
- Positive influence on breastfeeding practices in the hospital and community by underlining need for mother's milk alone for every baby

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