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Human milk banks: Evolution of wet nursing: Reducing neonatal mortality

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Abstract

Human milk is acquired from lactating donors in human milk banks. The donated breast milk is collected using the proper techniques, examined for contamination and microbiological load, pasteurized using various procedures, and then stored so that it can be made available on demand to neonates who are unable to get human breast milk for whatever reason. Wet nurses, also known as dhatri, were employed in both ancient India and the rest of the globe to provide breast milk for the infants. The issue of VLBW (Very Low Birth Weight) and LBW (Low Birth Weight) mortality affects India and many other developing nations, but it can be resolved by promoting breastfeeding, which also dramatically lowers the risk of infections. Thus, in order to promote the idea of milk banking for the benefit of thousands of people, health specialists and regular people must work together. Since 1909, the year the second human milk bank opened in Boston after the first one founded in Vienna. In 1989, Mumbai's Lokmanya Tilak Municipal Medical College and General Hospital established India's first human milk bank. In comparison to the rising number of neonatal critical care units, the number has climbed to 90, although it is still quite low. Every larger hospital with post-natal wards or Well Baby clinics, where there are more milk donors accessible and the medical or nursing staff can encourage them to donate milk, has to set up milk banks. Efforts made by the government or non-governmental groups to promote and maintain human milk banks will lessen the likelihood that breast milk will become spoiled and infant mortality will increase.

Keywords: Human milk bank, wet nurse, dhatri, low birth weight, PDHM (pasteurized donor human milk)

Introduction

Human milk continues to be the only milk that is uniquely suited to the human infant. When a mother, for some reason, is unable to feed her infant directly, her breast milk should be expressed and fed to the infant. The origins of donating human milk can be traced to the early practice of wet nursing, in which children were breastfed by friends, relatives, or strangers.

By the 11th century, wet nurses were almost exclusively employed by Europe's nobility and royalty. It is common knowledge that during the Mughal dynasty in India, Dai Anga and Maham Anga nursed Akbar and Shah Jahan, respectively.

Wet breastfeeding became less common in the 19th century, and alternate milk sources (such as animals) became more popular. When a mother or wet nurse is unable to feed for any reason, it has been proposed in ancient Indian ayurvedic writings and by Acharya Sushruta that goat or cow's milk can be administered in the proper volumes. Between human and cow's milk, there are a number of dietary, physiological, and biochemical variations. Compared to human milk, cow's milk is less digestible, has fewer carbs, and has less antibodies. Biochemically, human milk is more effective.

The issue of very low birth weight (VLBW) and significant mortality and morbidity among this demographic are difficulties that India is now dealing with. These infants' risk of infection can be greatly decreased by breast-feeding them. Therefore, it is imperative that laypeople and health professionals work together to promote the idea of milk banking for the benefit of thousands of low birth weight and premature new borns.

In 1902 to 1911, Theodor Escherich, Chair of Pediatrics at the University of Vienna, explained that neonates who are nursed have different gut bacteria than new borns who are fed by other methods. However, nothing else provides a new born with as complete a diet as mother's milk.

The Imperial Institute for Maternal and Infant Care initiated the first human milk bank in Vienna in 1909 and the second opened in Boston.

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What is a milk bank?

A human milk bank, breast milk bank or lactarium is a service that collects, screens, processes, and dispenses by prescription human milk donated by nursing mothers who are not biologically related to the recipient infant. The Milk Bank exercises the safe collection and distribution of pasteurized donor human milk (PDHM) for all babies, especially to infants in emergency situations, such as those who are affected by disasters, are critically ill or born prematurely.

In 1989, Lokmanya Tilak Municipal Medical College and General Hospital in Mumbai opened the country's first human milk bank. 22 human milk banks were eventually formed between 2005 and 2015 after an initially gradual rise. In India right now, there are more than 90 human milk banks. Nevertheless, the number is incredibly small when compared to the rise in newborn intensive care units.

Every larger hospital with post-natal wards or Well Baby clinics, where there are more milk donors available and who can be persuaded to give by the medical or nursing staff, can build milk banks.

Guidelines for recipients

If PDHM supplies are sufficient donor milk may be supplied for:

1. Absence of production and secretion of breast milk.
2. Babies of Multipara mothers with insufficient breast milk.
3. For babies who are adopted neonates and induction of lactation is not possible.
4. Sick or Abandoned neonates.
5. Interruption of breastfeeding.
6. Infants at health risk from the breast milk of the biological mother.
7. Babies whose mothers died in the immediate postpartum period.

Guidelines for human milk donors**Who can donate?**

A lactating woman who:

1. Is in good health, good health-related behaviour, and not regularly on medications or herbal supplements (with the exception of prenatal vitamins, human insulin, thyroid replacement hormones, nasal sprays, asthma inhalers, topical treatments, eye drops, progesterin-only or low dose estrogen birth control products);
2. Is willing to undergo blood testing for screening of infections; and
3. Has enough milk after feeding her baby satisfactorily and the baby is thriving nicely.

Who cannot donate?

A donor is disqualified who:

1. Uses illegal drugs, tobacco products or nicotine replacement therapy; or
2. Regularly takes more than two ounces of alcohol or its equivalent or three caffeinated drinks per day; or
3. Has a positive blood test result for HIV, HTLV, Hepatitis B or C or syphilis; or
4. Is herself or has a sexual partner suffering from HBV, HIV, HCV and venereal diseases OR either one has high risk behaviour for contracting them in last 12 months; or
5. Has received organ or tissue transplant, any blood

transfusion/blood product within the prior 12 months.

6. Is taking radioactive or other drugs or has chemical environmental exposure or over the counter prescriptions or mega doses of vitamins, which are known to be toxic to the neonate and excreted in breast milk; or
7. Has mastitis or fungal infection of the nipple or areola, active herpes simplex or varicella zoster infections in the mammary or thoracic region.

Guidelines for installing milk bank**Location of human milk banks**

It must be located close to the Neonatal units. This will ease the task of exclusive breastfeeding in VLBW babies. Postnatal wards or Well Baby clinics are suitable places to hold Human Milk Banks.

Infrastructure

A partitioned room, where at least the equipment required for milk expression, and storage are available. Facilities for counselling about the expression of breast milk, and the benefits of breast milk is to be done by the milk bank staff. Private space for breast milk expression must be made available.

Equipment to be available in milk bank are as follows**Breast milk pumps**

Hospital grade electric pumps are preferred as they result in better volumes of expressed milk and are relatively painless and comfortable to use. Manually operated breast milk pumps can be used with lower cost implications. Breast pumps can be reused with proper cleaning/ sterilization as they can serve as the source of infection.

Containers

- a) Single-use hard plastic containers made up of polycarbonates, Pyrex, or propylene are in use across the world, for collecting and storing milk. Indian set up cylindrical, wide-mouthed Stainless steel containers of about 200 ml capacity with tight-fitting/ screwed caps are in use as they are easily available, and are durable, easy to clean, and autoclave.
- b) A hot air oven/Autoclave is required for sterilizing the containers used for collection from donors, containers for pasteurization and the test tubes needed for sending milk culture samples to the microbiology laboratory.
- c) Pasteurizer: Milk is pasteurized with different methods. Pasteurized milk is processed to reduce the microbial load.

Storage facility**Deep freezer**

A deep freezer to store the milk at -200 C is essential in the milk bank.

Refrigerators

These are required to store the milk till the whole day's collection is over and the milk is ready to be mixed.

Milk analyser

It is desirable to have macronutrient analysis of breast milk to estimate the calorie, protein, and fat of a milk sample, using infra-red spectroscopy technology, in teaching hospitals as a step towards lacto-engineering.

Generator/Uninterrupted power supply

Every milk bank should have an uninterrupted power supply backup to run the deep freezers and refrigerators in case of electricity failure.

Administrative staff

Human milk banks should have a panel of consultants including representatives from the areas of paediatrics /neonatology, lactation, microbiology, nutrition, and public health. Nurses for counselling mothers and assisting with the expression of breast milk are required. Milk bank technician (for pasteurization of breast milk and microbiological surveillance).

Conclusion

A human milk bank, also known as a breast milk bank or lactarium, is a facility that gathers, tests, processes, and dispenses human milk that has been donated by nursing mothers who are not the recipient infant's blood relatives. The Milk Bank practices the secure collection and distribution of pasteurized donor human milk (PDHM) for all infants, particularly to those in emergency situations, such as those afflicted by disasters, those who are seriously ill, or those who are born prematurely. Efforts are required at the national level to encourage human milk banks to be established at tertiary-level hospitals with neonatal care units with innovative methods, in order to reduce neonatal mortality globally.

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