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Human Milk Banking

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Introduction

Human milk bank play an essential role by providing human milk to infants who would otherwise not be able to receive human milk. Human milk protects premature infants from infectious disease. Breast milk is the safest and healthiest source of nutrition for a baby. Breast feeding is an un equalized way of providing ideal food for the healthy growth and development of infants. As a global public recommendation, infant should be exclusively breast feed for the first six month of life to achieve optimal growth and development [1-4].

Importance of breast feeding

- Breast feeding enhances the bonding between mother and baby.
- The first secreted milk named colostrum is rich with immunoglobulin IgA which help in the development of immune system.
- The antibodies present in the milk helps to fight against infectious diseases like Respiratory tract infection, Ear infection etc.
- It acts as a contraceptive method.
- It helps breast feed mother reducing the weight gained during prenatal period.
- It reduces the risk of breast and ovarian cancer in mothers.
- Breast feeding babies are less prone to anemia and vitamin deficiency.
- Human milk contains omega 3 fatty acid which helps in brain growth and development.

Unsafe conditions for breast feeding

These circumstances are deemed inappropriate.

- Breast surgery.
- Therapies used for the treatment of carcinoma such as radiation therapy and chemotherapy.
- Infectious disease such as hepatitis B or C, AIDs, food and water borne disease such as cholera, E coli infections.
- Mother who are taking medications such as illegal drugs, ant metabolites etc.
- The mother suffering from all these conditions cannot breast feed their babies. In such a situation only way to nourish the baby through artificial feeding.

Artificial Feeding / Formula Feeding

Artificial feeding means to feed the baby or child other than breast milk. It involves the use of breast milk substitutes in the form of liquid milk that is fresh cow milk/ buffalo's milk or commercially available dried whole milk such as Nangrow, Lactogen [5-7].

Complications of Artificial Feeding

- Chronic diseases such as diabetes, Obesity, Heart disease, Childhood cancer.
- Infant is not taking enough formula for his age and weight, dehydration may result.
- Infections such as lung infections, ear infections.
- Allergies and asthma.

By considering these complications of artificial feeding, it is not as safe as human milk. So therefore an alternate method must be opted.

Human milk banking

A human milk bank is a bank of breast milk which supplies donated breast milk to unwell, premature newborn just like a blood bank functions to supply blood to those in needs.

Definition

A human milk bank is a service for collecting, screening, processing, storing and distributing essential role by providing human milk to infants who would otherwise not able to receive human donated human milk.

Trends

- The world's first milk bank was setup in Vienna, Austria in 1909.
- The first Asian country to set up a human milk bank was in India, way back in 1989 at Lokamanya Tilak hospital Mumbai.
- A project is under progress for the opening of human milk bank in Kerala. The human milk bank project is titled NECTAR OF LIFE. It has got support from the Rotary International to set up the first bank in Ernakulum.

- The state capital is set for a giant leap in neonatal care as it will soon have a human milk bank at SAT Hospital in Trivandrum.

Human milk banks in India

- Amara milk bank, Greaterkailash New Delhi.
- LokamanyaTilakHospital,Sion , Mumbai.
- CamaHospital, Fort, Mumbai.
- KEM Hospital, Parel, Mumbai.
- Sir JJ Group of Hospital, Byculla, Mumbai.
- Divya Mother Milk Bank, Udaipur, Rajasthan.
- SSKM Hospital, Kolkata.
- Dheenanath Mangeshkar Hospital and Research Centre, Punai.
- Institute of Child Health, Egmore, Chennai.
- VijayaHospital, Chennai.

Indications

- 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 post-partum period [8,9].

Equipments

- Pasteurizer/shaker-water bath : It is essential to have advise to carry out heat and treatment of donor milk at one recommended temperature of 62.5⁰ C for a period of 30 minutes prior to its use
- Deep freezer: Deep freezer to store milk at 20⁰C is essential in the milk bank.
- Refrigerators: These are required to store the milk till the whole day collection is over and the milk is ready to be mixed and pulled for further processing.
- Hot air oven / Autoclave: A hot air oven / Autoclave in the milk bank is essential for sterilizing the articles needed in the bank.
- Breast milk pumps: For milk banking, hospital guide electric pumps are preferred has a result in better volumes of expressed milk and are relatively painless and comfortable to use.
- Containers: For collection and storing the milk, single use hard plastic Containers are used such as, propylene, polycarbonate or Pyrex are used across the world.However, in Indian experience, cylindrical, wide mouthed stainless steel containers of about 200 ml capacity with tight fitting or screwed caps are equally effective.
- Generator: Every milk bank should have a dedicated centralized source of uninterrupted power.

- Milk analyzer: It is desirable to have macro nutrient analysis of breast milk to estimate the calorie, protein and fat of a milk sample.

Human Milk Banking Process

Step 1: Donation

- Donation is the process in which the mother donates their milk to the milk bank.

Pre- Preparation of Donors:

- Proper counseling given to mothers.
- Checking suitability for mothers.
- Getting written informed consent from donors.
- A thorough history taking from donor about their health conditions.
- Laboratory tests should be done in donor mothers.
- Methods of express milk
 - Manually operated Breast milk pump.
 - Electric breast pump

Properly pumping and collecting expressed breast milk are important step in the donation process.

- A donor must be
- In good general health
- Mother should have adequate milk production.
- Free from infectious disease.
- Have a negative Tyne test (It is a multiple puncture Tuberculin skin test Used to aid in medical diagnosis of Tuberculosis)
- Have a negative VDRL (venereal disease research laboratory: A blood test used for syphilis)
- Infectious disease such as hepatitis B or C, AIDs, food and waterborne diseases such as cholera, E-coli infection.
- Do not undergoing radiation and chemotherapy.
- Do not taking medication such as illegal drugs, Antimeta bolites.

Step 2: Clean Technique

Donors are educated regarding the most the most hygienic way to express milk.

- Before each pumping session.
 - Wash your hands thoroughly with soap and water and dry with a clean towel.
 - Gently wipe the nipple and the breast, from the nipples and the breast, from the nipple out, with clean, damp wash cloth and mild soap
 - Express your milk into a sterile container.

Step 3: Pouring

Staff and volunteers pour thawed milk into sterile container.

Step 4: Nutritional Analysis

A sample of each donor milk is scanned by infrared spectroscopy (the milk scan) to determine the fat, protein and lactose content.

Step 5: Boiling

Mixed pools of milk targeting the nutritional needs of sick babies are poured into a bottle for pasteurization.

Step 6: Pasteurizing

Milk is heated to 62.5 °C for 30 minutes. Pasteurization kills viruses and bacteria that could be harmful to fragile infants, while retaining most of the milk's beneficial components

Step 7: Bacteriological Cultures

Milk is cultured before and after pasteurization to ensure absence of bacteria

Step 8: Freezing

Pasteurized milk is stored in a deep freeze until dispensed to hospital and outpatient babies (Figure 1).

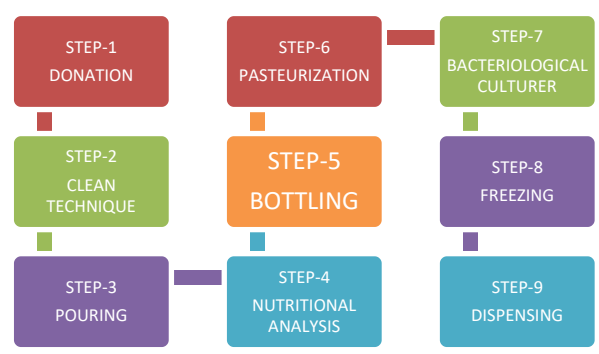


Figure 1: Human milk banking process.

How We Can Organize Breast Milk Banking?

- **Director**
For planning, implementing and evaluating the services.
- **Milk bank officer**
Usually, a doctor needed for running of one bank.
- **Lactation management nurses**
The nurse helps to counselling the mothers and assisting in expression of breast milk.

- **Milk bank technician**

For pasteurization of breast milk and microbiological surveillance.

- **Milk bank attendant**

For collecting containers for sterilization and maintaining hygiene.

- **Receptionist**

For record keeping and public relations

- **Microbiologist**

For micro biology testing and infection control policies.

Transportation

- Put the frozen milk in an insulated bag or in a cooler.
- Use freezer get packs. Keep these in the freezer when not in use.
- Try to keep the milk frozen on the way to the hospital. It milks fully thaws; we must use it within 24 hours or throw away. Milk can be refrozen it only partially thawed.

Storage

Storage should be done in the same container that is used for pasteurization .Culture negative processed milk should be kept at 20⁰ c tightly sealed container with clear mention of expiry date and other relevant data on the label .It can be preserved for 3-6 months.

Influence of human milk bank on society

- Human milk bank helps the infants, who have lost their mothers during birth or after birth, to get enough feed
- It helps in the development of a well-nourished generation
- Donating human milk to the milk banks prevents the mothers from reproductive carcinomas like breast cancer, ovarian cancer and uterine cancer

Conclusion

It is clear that artificial formula will never provide the broad range of benefits of human milk. Given the high rate of preterm births in the country and level of malnutrition that ensues in the postnatal growth in such babies after birth, there is an urgent need to establish milk bank across the country, especially in the large neonatal units of all hospitals.

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