

## Review Article:

# Raw human milk banking in India: Scope and application

Bharadva K\*, Yadav B\*\*, Tiwari S\*\*\*

Practicing Pediatricians, \*Surat, \*\*Gurgaon, \*\*\*Founder Convener, Human Milk Banking Association of India. Corresponding author: Dr Satish Tiwari, Yashodanagar, 2Amravati 444606, Maharashtra; Phone 0721-2541252, 0942285720; drsatistiwari@gmail.com Received: February 23, 2017. Reviewed: March, 27, 2016. Accepted: April, 25, 2017

### Abstract:

Breastmilk feeding is the gold standard. Formula milk is getting easy access due to ignorance of scientific principles, lack of commitment and efforts to promote human milk, besides unavailability of human milk banks. There is a grave need to create awareness for using breastmilk in health care facilities.

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 and practiced in Norway.

Bacteriostatic qualities of fresh milk resist bacterial growth. Bacterial counts reduce in fresh breastmilk over initial few hours due to phagocytic activity. Newborns fed MoM with high commensal bacteria count has no untoward effects. Thus pasteurization of MoM is not recommended. Unprocessed mother's milk is choice of feeding pre-terms as often it grows only commensals on preserving. Such infants did not show higher late sepsis rates; had better fat absorption & growth; shorter hospital stay as compared to pasteurized donor milk.

Refrigerators are there everywhere so MoM feeding can be easily practiced with proper dissipation of scientific information on managing human milk. In resource poor and ethic restricted countries efforts are being put to use unpasteurized raw frozen donor milk after stringent donor

screening. These observations and facts open door to concept of raw human milk banking which has large scope in India. It is suggested that, before starting to donate, documenting two negative tests each for HIV, HBsAg and VDRL are desirable.

**Key words:** *Human Milk Banks, Breastfeeding, Mother's own Milk, Formula feeds, Pasteurized human milk*

Raw human milk banking in India: Scope and application

Breastmilk feeding is gold standard that covers all needs of newborns including sick ones. It is a potent tool to reduce neonatal mortality upto 16% in view of sepsis as major cause of mortality in India. All babies should have continuous supply of safe breastmilk including those admitted at health facilities. 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.

Formula milk is getting easy access due to ignorance of scientific principles of managing human milk and lactation, lack of commitment and efforts to promote human milk and unavailability of human milk banks. There is a grave need to create awareness for using breastmilk instead of formula milk in health care facilities too. Often maternity services give formula supplements as a general practice in first 48 hours after birth rather than proper management of lactation. A large

number of newborns are put on formula milk for various indications listed below and for perceived convenience.

1. VLBW or <32 weeks premature or sick newborn too weak to suck.
2. Mother separated due to her illness including varicella, active open tuberculosis, untreated brucellosis, H1N1 infection.
3. Working mothers.
4. Engorgement and other breast conditions like surgery, retracted nipples, skin problems like herpes on breast, etc.

Often MoM is available but the newborn cannot take directly from her breast and most conditions are temporary or manageable by medical/surgical management. To tide over the crisis the MoM can be expressed, stored and fed and later direct breastfeeding be resumed. With scientific information and infrastructure for proper storage of human milk most NICUs and maternity homes can cater newborns with human milk. Late preterms and operative deliveries will benefit the most. Working women can maintain their infants by storing MoM in workplace refrigerator. Table 1

Most of the dangers of transmitting infections and toxins to the recipients by donated breastmilk are evaded by using MoM. Mother with hepatitis-B or CMV can continue breastfeeding own child. In developing countries WHO recommends exclusive breastfeeding by HIV positive mothers after proper counseling. 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 where donors are screened regularly, strict protocol is followed and all milk is microbiologically tested. The risk is

very minimal especially if the donation is voluntary and is from within the known community. For ELBW babies, pasteurized milk or milk from the CMV-negative mothers may be used to prevent theoretical risk of CMV transmission. But given that large number of term and late preterm infants in our country who need it, use of raw human milk is quite practical.

Bacteriostatic qualities of fresh milk resist bacterial growth without refrigeration up to less than 6 hours. They are persistent with freezing also but destroyed by pasteurization thus pasteurized milk is more susceptible to later contamination. Bacterial counts reduce in fresh breastmilk over initial few hours due to phagocytic activity. So if not available, refrigeration may be done within 4 hours. Newborns fed MoM with high commensal bacteria count has no untoward effects and thus be fed raw and milk with potential pathogens should not be used. Thus pasteurization of MoM is not recommended. The decision not to freeze the milk may be made on practical grounds. Storage less than 48 hours before use retains antioxidant properties which is better with refrigeration than with freezing-thawing.

Pasteurization results in loss of many immunological properties. Unprocessed mother's milk is choice of feeding pre-terms as often it grows only commensals on preserving. Such infants did not show higher late sepsis rates; had better fat absorption and growth; shorter hospital stay as compared to pasteurized donor milk, , , .

The cost of a conventional milk bank is high and unsustainable at the village or a block level in India. Pasteurization process bears a major time, expertise, staff, maintenance and financial expenses. For conditions where fresh MoM can be used pasteurization may be avoided. It can be a major saving when implemented for large population.

In remote places, poor resources the situation is grave where breastfeeding is undermined by formula milks and absence of conceptualization of feeding raw milk. But refrigerators are there

everywhere so MoM feeding can be easily practiced with proper dissipation of scientific information on managing human milk. In resource poor and ethic restricted countries efforts are being put to use unpasteurized raw frozen donor milk after stringent donor screening .

These observations and facts opens door to concept of raw human milk banking which has large scope in India. It is suggested that, before starting to donate, documenting two negative tests done at longest interval of false negative window period for HIV, HBsAg and VDRL can be the strategy for recruitment of donor for safe raw milk banking in addition to strictly voluntary donation avoiding any commercial influence whatsoever at any stage, with stringent donor risk screening, microbiologic testing, strict hand and expression

hygiene and immediate storage at cold temperatures (Table-1) are mandatory to use unpasteurized human milk .

This strategy is an effort to provide breastmilk to all babies, in addition to the efforts to promote natural breastfeeding by mother. The Human Milk dispensing strategy for sick babies is an innovative strategy that has been implemented in many countries with much success in reducing hospital stay, improved survival outcome, low infection rates and human milk's contribution towards enhancement of the Intellectual quotient of the child. We need to conduct widespread awareness and training at all levels of health care of infants for management of human milk expression and storage to make this strategy successful.

**Table 1: Storage Duration of Fresh Human Milk for Healthy Full Term Infants**

Placement (Temp.)	Safe period	Remarks
Table top (<25°C)	6 to 8 hours	Keep covered and as cool as possible e.g. using cool cloth over container.
Cold box- insulated (4 to 15°C)	24 hours	Keep ice packs in contact with milk containers & restrict opening of box.
Fridge (up to 4°C)	5 days	
Freezer unit of a fridge (-15°C)	15 days	
Freezer unit of fridge with separate doors (-18°C)	3-6 months	Keep milk container toward the back of compartment to minimize temperature fluctuations
Deep freezer (-20°C)	6-12 months	

**Competing Interest:** None;

**Funding:** Not required.

#### References:

1. Darmstadt GL, Bhutta ZA, Cousens S, Adam T, Walker N de. Evidence-based, cost-effective interventions: how many newborn babies can we save? Lancet [Internet]. 2005;Mar 12-18(365(9463)):977-88. Available from:<http://www.ncbi.nlm.nih.gov/pubmed/15767001>
2. Arnold LDW. Global health policies that support the use of banked donor human milk: a human rights issue. Int Breastfeed J [Internet]. 2006 Jan [cited 2013 Oct 19];1(1):26. Available from:<http://www.internationalbreastfeedingjournal.com/content/1/1/26>
3. Section on Breastfeeding. Breastfeeding and the use of human milk. Pediatrics [Internet].

- 2012 Mar 1 [cited 2013 Sep 19];129(3):e827-41. Available from:<http://pediatrics.aappublications.org/content/129/3/e827.full>
4. The Academy of Breastfeeding Medicine Protocol Committee. ABM Clinical Protocol #8: Human Milk Storage. Breastfeed Med [Internet]. 2010;5(3):127-30. Available from: <http://www.bfmed.org/Media/Files/Protocols/Protocol 8 - English revised 2010.pdf>
5. Horvath T, Madi BC, Iuppa IM, Kennedy GE, Rutherford G, Read JS. Interventions for preventing late postnatal mother-to-child transmission of HIV. Cochrane database Syst Rev [Internet]. 2009 Jan [cited 2016 Jun 1];(1):CD006734. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/19160297>
6. Acceptable Medical Reasons for Use of Breast-Milk Substitutes [Internet]. World Health Organization; 2009 [cited 2016 Jul 12]. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24809113>
7. Grøvslien AH, Grønn M. Donor milk banking and breastfeeding in Norway. J Hum Lact [Internet]. 2009 May [cited 2013 Oct 18];25(2):206-10. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/19414822>
8. Pittard WB, Anderson DM, Cerutti ER, Boxerbaum B. Bacteriostatic qualities of human milk. J Pediatr [Internet]. 1985 Aug [cited 2016 Jul 8];107(2):240-3. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/3839527>
9. Hernandez J, Lemons P, Lemons J, Todd J. Effect of storage processes on the bacterial growth-inhibiting activity of human breast milk. Pediatrics [Internet]. 1979 Apr [cited 2016 Jul 8];63(4):597-601. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/375180>
10. Björkstén B, Burman LG, De Chateau P, Fredrikzon B, Gothefors L, Hernell O. Collecting and banking human milk: to heat or not to heat? Br Med J [Internet]. BMJ Group; 1980 Sep 20 [cited 2016 Jul 8];281(6243):765-9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/7427442>
11. Ainsworth SB. Feeding and nutrition in the preterm infant. Arch Dis Child [Internet]. BMJ Group; 2006 Jan 11 [cited 2016 Jul 12];91(4):374-5. Available from: <http://adc.bmj.com/cgi/doi/10.1136/adc.2005.091371>
12. Carroll L, Davies DP, Osman M, Mcneish AS. Bacteriological Criteria For Feeding Raw Breast-Milk To Babies On Neonatal Units. Lancet [Internet]. Elsevier; 1979 Oct [cited 2016 Jul 8];314(8145):732-3. Available from: <http://linkinghub.elsevier.com/retrieve/pii/S0140673679906548>
13. Hanna N, Ahmed K, Anwar M, Petrova A, Hiatt M, Hegyi T. Effect of storage on breast milk antioxidant activity. Arch Dis Child Fetal Neonatal Ed [Internet]. BMJ Group; 2004 Nov [cited 2016 Jul 8];89(6):F518-20. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/15499145>
14. Ewaschuk JB, Unger S, O'Connor DL, Stone D, Harvey S, Clandinin MT, et al. Effect of pasteurization on selected immune components of donated human breast milk. J Perinatol [Internet]. 2011 Sep [cited 2016 Jul 14];31(9):593-8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/21330996>
15. Sosa R, Barness L. Bacterial growth in refrigerated human milk. Am J Dis Child [Internet]. 1987 Jan [cited 2016 Jul 8];141(1):111-2. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/3788872>
16. Andersson Y, Sävman K, Bläckberg L, Hernell O. Pasteurization of mother's own milk reduces fat absorption and growth in preterm infants. Acta Paediatr [Internet]. 2007 Oct [cited 2016 Jul 8];96(10):1445-9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/17714541>
17. Cossey V, Vanhole C, Eerdekens A, Rayyan M, Fieuws S, Schuermans A. Pasteurization of

- mother's own milk for preterm infants does not reduce the incidence of late-onset sepsis. Neonatology [Internet]. 2013 [cited 2016 Jul 8];103(3):170-6. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/23258423>
18. Montjaux-Régis N, Cristini C, Arnaud C, Glorieux I, Vanpee M, Casper C. Improved growth of preterm infants receiving mother's own raw milk compared with pasteurized donor milk. Acta Paediatr [Internet]. 2011 Dec [cited 2016 Jul 8];100(12):1548-54. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/21707744>
  19. Schanler RJ, Lau C, Hurst NM, Smith EO. Randomized trial of donor human milk versus preterm formula as substitutes for mothers' own milk in the feeding of extremely premature infants. Pediatrics [Internet]. 2005 Aug [cited 2016 Jul 8];116(2):400-6. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/16061595>
  20. Hsu H-T, Fong T-V, Hassan NM, Wong H-L, Rai JK, Khalid Z. Human milk donation is an alternative to human milk bank. Breastfeed Med [Internet]. 2012 Apr [cited 2016 Jul 8];7(2):118-22. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22011131>

*With Best Compliments From -*

## THE OSTEON SURGICALS

Address : Office No. 17, PATEL HERITAGE SECTOR-07, KHARGHAR, NAVI MUMBAI-410210  
Tel: (022)27747705, Fax No. (022)27747708,  
Mob: 9324868000/9930889999

### Branch Office

Address : Office No. 02, Suprabhat Rahiwasi Sangh  
Mahatma Phule Nagar, Kores Road, Wagale State, Thane- W  
Tel:- (022) 25812535/9930997777

**ALL TYPE OF SURGICALS MATERIALS SUPPLY AT LOWEST RATE,**

### COMPANY NAME'S AS FOLLOWS :

- |                               |                                   |
|-------------------------------|-----------------------------------|
| ■ ROMSON INDIA PVT. LTD       | ■ JONHSON & JONHSON               |
| ■ FRESNEUS KABI INDIA PVT LTD | ■ MAMTA SURGICAL COTTON INDUSTIER |
| ■ POLYMED INDIA PVT. LTD      | ■ JAYACHITRA TEXTILE              |
| ■ B.D.                        | ■ NULIFE                          |
| ■ BIPSON SURGICAL PVT. LTD.   | ■ RUSCH                           |