

Donor human milk for preterm infants in Munich - establishment and organisation of a human milk bank in a Bavarian university hospital

Dr Susanne Herber-Jonat

Department of Neonatology, Perinatal Centre Großhadern

Dr. von Hauner Children's Hospital, Munich, Germany

According to the World Health Organisation, breast milk from their own mother is the first best option for term infants. Human milk (HM) also offers benefits to preterm infants¹⁻³; however, in preterm infants, breast-feeding may not be possible, and own mother's milk may not be available in the first days of life. In this situation the WHO and the American Academy of Pediatrics recommend the use of donated breast milk until own mother's milk is available⁴. To offer this opportunity to preterm infants, donated HM could be obtained from a human milk bank (HMB). In Germany donor human milk banking has a long tradition. The first German HMB was founded in 1919 in Magdeburg. After World War II human milk banking was especially promoted and subsidised in the eastern part of Germany where 62 HMB were run in 1959. After the reunification of Germany many HMB were closed in order to economize. With no financial and little public backing, only nine milk banks survived until 2011, all of them offering pasteurised human milk to their local neonatal units⁵.

When the project to establish a HMB especially for very small preterm infants at the neonatal unit of the University of Munich was started, uniform guidelines for the establishment, organisation and running of a HMB in Germany did not exist. The existing facilities were run in direct responsibility of the operating children's hospitals. Donated breast milk was classified neither as food nor as a medical product. Although the conception of the HMB at the University of Munich followed in substantial parts the Swiss guidelines on the organisation and functioning of a HMB⁶, many obstacles had to be overcome especially because the Munich HMB aimed for the use of unpasteurised HM of mothers sero-negative for human cytomegalovirus.

Pasteurisation of donated HM minimizes the risk of disease transmission by inactivating most of the viral and bacterial contaminants. However significant concerns are related to the possible alterations in the nutritional and biological quality of DHM because of the heat treatment. Holder pasteurisation, the most commonly used method to pasteurise human milk, results in the decrease of quantity and/or activity of several functional milk components (i.e. IgA, secretory IgA, lactoferrin, IL-10, lipase activity and hormones⁷⁻⁹). The Munich HMB provides unpasteurised HM in order to preserve the biological properties of donated HM. Donors are screened in a similar way as for blood donation, and are asked about their use of alcohol, nicotine, and drugs. Only sero-negative mothers are eligible. Milk has to be pumped under special clean conditions in a dedicated room with hygiene facilities. Sterile pump sets fitted with sterile, freezing-stable bottles are used and every donation is supported and guided by a lactation consultant. A milk sample for microbiological testing is taken from every lot before the whole sample is registered, shock-frozen and stored for a maximum of three months at -20°C. Milk is used raw if no pathological bacteria are detected (<10³ CFU) and the concentration of normal skin bacteria is between 10³ - 10⁵ CFU.

References

1. Boyd CA, Quigley MA, Brocklehurst P. Donor breast milk versus infant formula for preterm infants: systematic review and meta-analysis. *Arch Dis Child Fetal Neonatal Ed* 2007;92:F169–75.
2. Sisk PM, Lovelady CA, Dillard RG, et al. Early human milk feeding is associated with a lower risk of necrotizing enterocolitis in very low birth weight infants. *J Perinatol* 2007;27:428–33.
3. Meinen-Derr J, Poindexter B, Wrage L, et al. Role of human milk in extremely low birth weight infants' risk of necrotizing enterocolitis or death. *J Perinatol* 2009;29:57–62
4. American Academy of Pediatrics. Section on Breastfeeding. Breastfeeding and the use of human milk. *Pediatrics* 2012;129:e827–41.
5. Springer S. Human milk banking in Germany. *J Hum Lact March* 1997 vol. 13 no. 1 65-68
6. Frischknecht K, Wälchli C, Annen C, et al. Recommendations pour l'organisation et le fonctionnement d'une banque de lait en Suisse. *Paediatrica* 2010;21:24–8.
7. Koenig A, de Albuquerque Diniz EM, Barbosa SF, et al. Immunologic factors in human milk: the effects of gestational age and pasteurization. *J Hum Lact* 2005;21:439–43
8. Hamprecht K, Maschmann J, Muller D, et al. Cytomegalovirus (CMV) inactivation in breast milk: reassessment of pasteurization and freezethawing. *Pediatr Res* 2004;56:529–35.
9. Baro C, Giribaldi M, Arslanoglu S, et al. Effect of two pasteurization methods on the protein content of human milk. *Front Biosci (Elite Ed)* 2011;3:818–29.