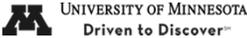


Pasteurized Human Donor Milk: Importance in the NICU setting

Perinatal Hospital Leadership Summit 2016

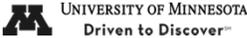
Nancy Fahim, MD
University of Minnesota



1

Biological aspects

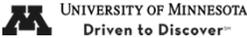
- Human milk: a species-specific “dynamic biological system” with bioactive and immune factors: GI hormones, immunoglobulins, lactoferrin, lysozyme, lipase, oligosaccharides, nucleotides, growth factors,, antioxidant factors and cellular components.
- Pasteurized milk maintains some biological properties: IgA, lactoferrin and lysozyme are present but reduced, oligosaccharides, most Vits and minerals and long chain fatty acids –unaffected.



2

Biological aspects

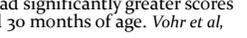
- Host defense against infections
- Modulate immune response
- Modify intestinal bacterial colonization
- Quality of nutrition



3

Preterm Outcomes with MOM

- Lower rate of *late onset sepsis and NEC* (dose response effect) and *improved neurodevelopmental* outcomes:
- Meta-analyses of 4 randomized clinical trials (1983 to 2005) supports the conclusion that feeding preterm infants human milk is associated with a significant reduction (58%) in the incidence of *necrotizing enterocolitis (NEC)*.
- Preterm infants fed an exclusive human milk diet compared with those fed human milk supplemented with cow-milk-based infant formula products noted a 77% reduction in the odds of developing NEC. *Sullivan et al, 2010*
- Clinical feeding tolerance is improved, and the attainment of full enteral feeding is hastened by a diet of human milk. *Vohr et al, 2007*
- *Neurodevelopmental*: Extremely preterm infants receiving the greatest proportion of human milk in the NICU had significantly greater scores for mental, and behavior ratings at 18 and 30 months of age. *Vohr et al, 2007*



4

Need for Supplementation

- However, mothers of ELBW infants may not supply 100% of the infant's needs.
- Only 30% were able to provide 100% of the milk during NICU stay.



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Benefits of DBM in the NICU

- Necrotizing Enterocolitis:
 - 12% of VLBW <1500 gm will develop NEC, ~30% of those will not survive.
 - 3 Recent Meta-analysis and several recent observational studies show significant reduction in NEC in PT infants fed donor BM versus formula *Quigley and McGuire, Cochrane database, 2014, Boyd et al, 2007, Quigley et al, 2007*
 - Case-control study comparing mother's own milk with pasteurized donor milk: no significant difference in outcomes only slight difference in growth in favor of maternal milk. *Giuliani et al, 2012*

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Other Potential Benefits of DBM

- Feeding tolerance
- Infectious – late onset sepsis
- Long term benefits: lipid profile, lower blood pressure, neurodevelopment
- Increased exclusive breastfeeding rates at discharge 30% vs 16% when banked milk is available (Italian Neonatal Network)

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AAP Statement

“The potential benefits are such that all preterm infants should receive human milk. Mother’s own milk, fresh or frozen, should be the primary diet, it should be fortified appropriately for the infant born weighing < 1.5 kg. If mother’s own milk is unavailable, pasteurized donor milk should be used.”

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Cost Effectiveness

- NEC ~20% of neonatal expenditures and ~\$5 billion/year for hospitalizations in the US.
- NEC review: If medically managed -cost of hospitalization~\$73,000 with 22 days increase length of stay, if surgery needed- an additional cost of \$186,000 and additional 60 days longer. *Bisquera et al, 2002*
- Johnson et al, 2015: NEC was associated with increase in cost of \$43,818 after controlling for variables.



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Cost Effectiveness

- Cost of Donor human milk per NICU infant - \$27 to \$590, influenced by mother’s ability to provide HM – 72% of mothers of VLBW infants needed Donor milk. *Carroll and Herrmann, 2013*
- Feeding 10 babies with exclusive BM can prevent 1 case of NEC and 8 babies with exclusive BM can prevent 1 case of surgical NEC or death. *Sullivan et al, 2010*



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Summary

AAP statement:

“The potential benefits are such that all preterm infants should receive human milk. Mother’s own milk, fresh or frozen, should be the primary diet, it should be fortified appropriately for the infant born weighing < 1.5 kg. If mother’s own milk is unavailable, pasteurized donor milk should be used.”



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11

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12