**Does Donor Breast Milk Prevent Necrotizing Enterocolitis in Very Low Birth Weight and Preterm Infants?**

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Necrotizing Enterocolitis (NEC) is an ischemic and inflammatory necrosis of the bowel that occurs in about 7-10% of preterm and low birth weight infants admitted to the Neonatal Intensive Care Unit (NICU). About a third of infants with severe NEC do not survive, and those who do often suffer from substantial morbidities such as growth delay, adverse neurodevelopmental outcome, and short gut syndrome. Infants fed their own mother’s breast milk have a six to ten times lower incidence of NEC compared to formula fed infants1-5. When an infant’s own mother’s milk is not available, pasteurized donor breast milk is a feasible alternative. The pasteurization process is crucial in minimizing the transmission of infections however it is unclear whether that process alters the beneficial effects of human milk and in turn the risk of developing NEC. This lead to my PICO question, does donor breast milk, when compared to preterm formula, confer the beneficial effects of breast milk in preventing NEC in preterm and low birth weight infants?

An extensive review of the literature using PubMed, Cochrane Library and Scopus databases with the following search terms: “preterm infants OR low birth weight AND donor breast milk AND formula,” “preterm infants OR low birth weight AND donor breast milk AND formula” and “fortified donor breast milk” AND preterm formula AND Necrotizing Enterocolitis” led to 2 randomized control trials and 1 meta-analysis selected for critical appraisal.

Sullivan et al (2010) is a multi-center, single-blinded randomized control trial that found supplemented fortified donor breast milk has an absolute risk reduction of 10% (95% CI 0.67-19.62%) of NEC when compared to fortified formula, with a number needed to treat of 10 (95% CI 5-150), and concluded that an exclusively human milk based diet is associated with lower NEC rates in extremely premature infants. The validity of this study was limited by the lack of complete blinding of caretakers due to the visual differences of donor breast milk and bovine milk and by the high intake of own mother’s milk across all groups (>70%). Corpeleijn et al (2016) is a multicenter, double blinded randomized control trial performed in the Netherlands that concluded donor milk and preterm formula supplemented during the first 10 days of life yielded similar safety and efficacy after both groups each had 17 cases of NEC. The validity of this study was limited by the high intake of own mother’s milk (>84%) in both comparison groups, the short intervention length of 10 days due to the unavailability of human based fortifier in the Netherlands, the high percentage of own mother’s milk after the intervention period until follow up at 60 days, and the limited amount of the intervention received as 14% of participants did not receive donor breast milk until the last day of enrollment.

Quigley et al (2014) is a Cochrane review of 6 randomized control trials with a total of 431 infants, and ultimately concluded that formula doubles the risk of NEC by 2.77 times (95% CI 1.40-5.46) compared to donor breast milk, with a number needed to treat of 25 (95% CI 14-50). They also found a sole diet of formula increases in the incidence of NEC by 4.62 times (95% CI 1.47-14.56) compared to a sole diet of donor breast milk. There was no statistical difference when either was supplemented to own mother’s milk. The author’s judgment about the validity of the studies ranged from low risk to unclear risk of bias, with one study having a high risk of bias (Schlander 2005).

Based on these three appraisals, the clinical bottom line is that donor breast milk confers human milk benefits despite pasteurization as it is associated with a lower risk of NEC compared to preterm formula in low birth weight and premature infants. Based on these findings, when own mother’s milk is unavailable, pasteurized donor breast milk should be the first alternative, if available. The length of intervention remains unclear. Efforts should be made to increase the availability of donor breast milk programs in NICUs and future studies should compare pasteurized donor breast milk to preterm formula in evaluating the incidence of NEC as a sole primary outcome.

References:

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