Benefits of Early Enteral Milk Feedings in Intrauterine Growth Restricted Preterm Infants
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Growth restricted premature infants are neonates who are below 10% in growth for their age and less than 35 weeks gestation at birth. Intrauterine growth restricted (IUGR) infants are often identified during pregnancy through a Doppler ultrasound, which is one method for evaluating fetal blood flow in the umbilical artery. These infants are often delivered prematurely to prevent the risk of intrauterine death, which is more common in this population. All infants born prior to term are at risk for prolonged hospitalization, increased risk of infection (including necrotizing enterocolitis), feeding intolerance, and respiratory and cardiac complications. IUGR preterm infants are at even higher risk for these complications and tend to have more difficulty advancing on enteral feeds.

Mother's breast milk is well-documented as the optimal milk-feeding for all newborns, but provides even more protection to the preterm infant. Preterm infants are at risk for a life threatening gut infection, necrotizing enterocolitis (NEC), which generally occurs after enteral milk feeds. Breast milk provides special protections against this infection for preterm infants. This is in part due to an important breast milk component, bifidus factor, which causes *Lactobacillus bifidus* to proliferate in the gut and protect it from infection.

The premature infant is exposed to parenteral nutrition initially followed by enteral feeds either by a gastric tube or through suckling. The duration of time required for a preterm infant to advance to full feedings varies depending on the associated complications that affect the infant. There has been research examining the affects of early enteral milk feeds on the outcome of premature infants that may promote growth and shorten duration of parenteral nutrition, the alternative to enteral feedings, and hospital stay without increasing the risk of NEC. The long-term use of parenteral nutrition can have sequel that involve villous atrophy in the gut, increased
risk of sepsis, cholestatic jaundice, and vitamin and mineral deficiencies. For these reasons, enteral milk feeds should be started as soon as possible and advanced so parenteral nutrition is not needed.

Research published in *Pediatrics* in April 2012 looked specifically at the IUGR preterm infant to examine if early enteral feeds were associated with a higher risk of NEC. This research was sponsored by a United Kingdom (UK) based children's charity, Action Medical Research, and conducted by Dr. Alison Leaf at the University of Oxford. The study included 54 hospitals across the UK and Ireland and more than 400 preterm IUGR infants. The infants in the study were below 35 weeks gestation at birth and below the 10th percentile for weight along with having an abnormal antenatal umbilical artery Doppler waveform. They were randomly assigned to either an "early" enteral feeding group (on day 2 after birth) or a "late" enteral feeding group (day 6 after birth). Feedings were gradually increased in both groups by "feeding prescription," which was based on gestational age. Mother's own breast milk was recommended as the first choice followed by donor milk and infant formula. Overall, 74% of the "early" group and 91% of the "late" group received human milk as their first feed. Full, sustained feeds were established sooner in the "early" group at 18 days compared with 21 days in the "late" group. There was no evidence of difference in the incidence of NEC. Early feedings resulted in a shorter duration of parenteral nutrition, lower incidence of cholestatic jaundice and better weight gain at discharge.

This research provides important insight into the benefits and risks of early milk feedings in the IUGR preterm infant. The evidence from the large multi-sight research revealed no evidence of benefit to delaying the introduction of enteral feeds in this high-risk group beyond 48 hours. The decreased risks of cholestatic jaundice and improved weight gain without the increased risk of life threatening NEC when human milk feedings are initiated early were supported by the findings. Further research on how best to advance these feedings to promote optimal growth and development while preventing sequel of the growth restricted preterm infant are needed.
References:

