

Feeding the Very Immature Infant - a Developmental and Evolutionary Perspective

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Improved knowledge during the last decades has led to major advancements in perinatal care with concurrently increasing survival rates among very low birth weight (VLBW) infants ¹. This improvement has switched the focus from simply decreasing mortality to attaining decreased morbidity as well ². Nutrition is fundamental for life and development. When very preterm birth occurs the infant is taken from its natural support, and forced to adapt to an environment they are not ready for. Providing nutritional support in these infants is challenging, as they not only need to balance their high energy requirements for survival, but also optimal nutrition and an environmental context that supports growth and development ³. Additional partial parenteral nutrition (PPN) or total parenteral nutrition (TPN), necessitating intravenous access, is therefore needed. However, increased occurrence of risk factors such as delayed growth and nosocomial infections are associated with the use of PPN and TPN ⁴. The obstacles against reaching full enteral feeding are probably due to both a general physiological immaturity and a disorganized gastrointestinal motility ^{5,6}. However, studies have demonstrated that intraluminal nutrition with human milk is essential for villi growth and host defense by protecting against gastrointestinal atrophy, dysfunction and bacterial translocation ⁷⁻⁹. Several studies have also shown positive effects of high human milk intake on brainstem maturation¹⁰ and cognitive development ¹¹⁻¹² in preterm infants. Human milk, in particular the mother's own milk is important in this group of vulnerable infants, it contains numerous nutrients, hormones and host defence factors, with capacity to prevent inflammation and stimulate optimal growth ^{13, 14}. Human milk has also been proven to enhance gastric emptying in comparison to formula feeding ¹⁵. In studies of VLBW – infants, early initiation of small volumes of enteral feeds has been demonstrated to promote gastrointestinal maturation and development compared with TPN ^{16,17}. However, this feeding method also requires PPN through intravenous lines for extended periods. Continuous feeding has been proven to decrease energy expenditure both in adults and premature infants ^{18, 19}. There is also evidence that

feeding given as a slow rate infusion enhances duodenal motor function when compared to bolus feeding²⁰⁻²². However, the question whether different feeding strategies have an effect on gastrointestinal tolerance and growth has been raised by several authors but the results of these studies are limited and conflicting.²³⁻²⁵

Invasive procedures such as tube feeding may also act as a stressor during early postnatal age. In a randomised control study we elucidate behavioural stress response during tube feeding in VLBW infants. Significant increased behavioural stress was found in infants fed by bolus compared to continuous fed infants²⁶. In the view of published reports raising concerns that preterm infants are at high risk for feeding difficulties²⁷ later eating problems and malnutrition²⁷, it is of importance to highlight and discuss how to feed and what to give our smallest patients, the very immature infants.

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