Editorial

The feeding conundrum

Sreeram Subramanian[1], Srinivas Murki[2]

[1]Neonatal Unit, Department of Pediatrics, Paramitha Children Hospital, Hyderabad, India; [2]Neonatal Unit, Department of Neonatology, Fernandez Hospital, Hyderabad, India

Correspondence to: Srinivas Murki, MBBS, MD, DM, Professor of Neonatology. Neonatal Unit, Department of Neonatology, Fernandez Hospital, Hyderguda, Hyderabad 500029, India. Email: srinivasmurki2001@gmail.com.

Provenance: This is a Guest Editorial commissioned by the Editor-in-Chief Yu-Jia Yang (Xiangya Hospital of Central South University, Changsha, China).

Comment on: Tewari VV, Dubey SK, Kumar R, *et al*. Early versus Late Enteral Feeding in Preterm Intrauterine Growth Restricted Neonates with Antenatal Doppler Abnormalities: An Open-Label Randomized Trial. J Trop Pediatr 2017. [Epub ahead of print].

Submitted Mar 14, 2017. Accepted for publication Mar 19, 2017.
doi: 10.21037/tp.2017.03.11
View this article at: http://dx.doi.org/10.21037/tp.2017.03.11

Placental insufficiency is an important contributor to the intra utero growth restriction (IUGR). Increasing severity of placental insufficiency results in fetal adaptation (diving reflex) leading to preferential blood circulation to the brain and increased comprise of the intestines and the kidneys. Antenatal Doppler abnormalities including absent or reversal of end-diastolic flow (AREDF) in the umbilical artery in IUGR fetus is a reflection of greater severity of utero placental insufficiency and more compromised intestine. Prolonged exposure to fetal hypoxia and ischemia could result in altered development of motor, secretory, mucosal functions and after birth the intestine is more susceptible to stasis, abnormal colonization, and bacterial invasion (1). Post-natal physiological flow studies report persistent mesenteric artery flow abnormalities lasting for almost a week in IUGR infants with AREDF (2,3). Pregnancy induced hypertension in association with IUGR and neonatal neutropenia could further increase the risk of early infections in these neonates. Thus these high risk preterm infants are at risk for early necrotizing enterocolitis (NEC) [odds ratio (OR) =2.13; 95% CI: 1.49–3.03] due to ischemia of mesenteric vascular bed emanating from redistribution of blood flow to vital organs in the fetus (1). IUGR and also AREDF are thus independent risk factors for NEC when adjusted for gestational age at birth.

Enteral feeding is known to impose an increased oxygen demand and reduce the ability of the intestine to increase oxygen extraction in the background of fetal hypoxia/ischemia. A gut that is comprised in the antenatal period and had not yet recovered from the altered mesenteric artery flow abnormality may benefit from delayed enteral feeding. However such a policy is likely to increase the duration of parenteral nutrition, deprive the gut of hormones and enzymes and promote villous atrophy of the intestine. Increased use and duration of parenteral nutrition is known to be associated with catheter related blood stream infections, rare but potentially fatal central line associated complications like cardiac tamponade, drug administration errors, cholestasis, osteopenia of prematurity and metabolic complications. The pros and cons of a delayed feeding form the basis of a feeding conundrum in IUGR infants with fetal AREDF.

The largest study (N=404) till date the ADEPT trial, has shown that early initiation (between 24 to 48 h after birth) *vs*. late initiation of feeds (120 and 144 h after birth) does not increase the risk of severe NEC (Bell stage 2 and 3). The suspect NEC was higher in the early feeding group but is attributed to dysmotility by the authors. Seventy four percent of the early feeding group and 91% of late feeding group received exclusive human milk. Babies in the early feeding arm reached full enteral feeds 4 days earlier than the late group (4). The relative likelihood of establishing full feeds at any given time was 36% higher in the early group compared with the late group. Other related benefits of starting feeds earlier were a shorter duration of parenteral nutrition and of high-dependency care and a lower incidence of cholestatic jaundice. Earlier studies albeit small in number and not withstanding methodological differences

have shown similar results (5). The Cochrane meta-analyses neither found any significant increase in the incidence of NEC nor an increase in all-cause mortality in the subgroup of babies with growth restriction and Doppler abnormalities in the umbilical artery and early initiation of feeds in comparison to late initiation of feeds (6).

The AREDF group assumes more significance in Indian subcontinent due to high background incidence of IUGR. The high incidence of sepsis adds to the burden of prematurity thereby increasing morbidity and mortality in low and middle income group of countries. The present study by Tewari VV evaluated the optimal enteral prescription for these AREDF neonates in a well designed stratified (27 to 29 *vs*. 30 to 32 weeks) randomised control trial. Neonates were randomized into early feeding group (initiation of feeds between 12 to 48 h after birth) and late feeding group (120 to 144 h after birth) using exclusive breast milk. They found no difference in the incidence of NEC or feeding intolerance or the combined outcome of feeding intolerance and NEC in both the groups. The time to achieve full enteral feeds was similar in the extreme preterm arm but significantly longer in the very preterm arm between the early and late feeding groups even though the feed advancement protocol was similar. The incidence of sepsis did not differ between the arms in both the groups. Shorter time to achieve full feeds in the very preterm early feeding group did not translate in to early discharge. A novel scoring system was used to assess the readiness for initiation of feeds, though the validity of such a system needs to be established. Smaller sample size, presenting only the stratified analysis and low event rate especially in the extreme preterm arm precludes one from arriving at a firm conclusion.

This trial adds to the body of evidence that seems to indicate that it is safer to initiate feeds on day 2 in otherwise stable preterm growth restricted neonates with Doppler abnormalities in the umbilical artery. The feed advancement in such babies has to be done with extreme caution and the optimal approach remains uncertain. Adherence to exclusive breast milk feeding seems to be rewarding but it's indeed a challenge especially in the initial days after birth and in areas without proper donor milk banking. Future large scale multicentric randomized trials will probably clear the feeding conundrum.

Cite this article as: Subramanian S, Murki S. The feeding conundrum. Transl Pediatr 2017;6(2):86-87. doi: 10.21037/tp.2017.03.11

Acknowledgements

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

References

1. Dorling J, Kempley S, Leaf A. Feeding growth restricted preterm infants with abnormal antenatal Doppler results. Arch Dis Child Fetal Neonatal Ed 2005;90:F359-63.
2. Kempley ST, Gamsu HR. Superior mesenteric artery blood flow velocity in necrotising enterocolitis. Arch Dis Child 1992;67:793-6.
3. Maruyama K, Koizumi T. Superior mesenteric artery blood flow velocity in small for gestational age infants of very low birth weight during the early neonatal period. J Perinat Med 2001;29:64-70.
4. Leaf A, Dorling J, Kempley S, et al. Early or delayed enteral feeding for preterm growth-restricted infants: a randomized trial. Pediatrics 2012;129:e1260-8.
5. Karagianni P, Briana DD, Mitsiakos G, et al. Early versus delayed minimal enteral feeding and risk for necrotizing enterocolitis in preterm growth-restricted infants with abnormal antenatal Doppler results. Am J Perinatol 2010;27:367-73.
6. Morgan J, Young L, McGuire W. Delayed introduction of progressive enteral feeds to prevent necrotising enterocolitis in very low birth weight infants. Cochrane Database Syst Rev 2014;(12):CD001970.

