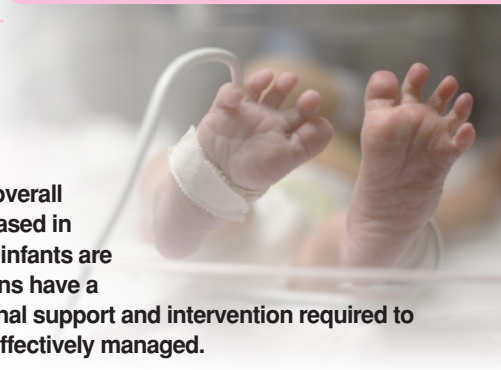
Martha Hughes, Scientific and Regulatory Executive, BSNA

Martha is an Associate Nutritionist with a degree in Nutrition from the University of Surrey. She has research and regulatory experience in specialist nutrition.

FEEDING THE PRETERM INFANT



Thanks to advances in antenatal care, the overall survival rates for preterm infants has increased in England over the last two decades.[1] These infants are vulnerable and specialist paediatric dietitians have a crucial role to play in providing the nutritional support and intervention required to make sure that the diet of these infants is effectively managed.

A preterm infant is an infant born before 37 completed weeks' gestation. Missing some or all of the third trimester of pregnancy has a significant impact on an infant's growth and development. Therefore, these infants have higher nutritional requirements than term infants and need to be managed appropriately. Physiological and metabolic stresses, such as respiratory distress or infection, will also increase additional nutritional demands, all of which need to be carefully and appropriately managed.[2,3]

Inadequate nutrition, particularly in preterm infants, can have short- and long-term health effects, including an association with longer stays in the neonatal unit, an increased risk of infection and worsened developmental outcomes.[4] It is important that the multidisciplinary team assesses every infant before feeding is started.

PARENTERAL NUTRITION

For most preterm infants, especially if an infant is under 30 completed weeks gestational age, or has a birthweight below 1kg[6] (Table 1), nutrition support is likely to be provided by parenteral nutrition within the first few hours of life. Parenteral nutrition is valuable and often lifesaving for preterm infants who are unable to tolerate sufficient enteral feeds to meet their nutritional needs.

According to NICE,[4] the current practice for using neonatal parenteral nutrition for preterm infants is in the immediate postnatal period whilst the preterm infant is attempting to establish enteral feeding, but has not yet established a nutritionally adequate breast milk or preterm formula intake. This can last a few hours, days, weeks, or longer, depending on the prematurity of the infant and whether they have digestive problems. Neonatal parenteral nutrition may also be used for infants whose feeds are being withheld because necrotising enterocolitis (NEC) is present or suspected, for critically ill infants, or for infants with gastrointestinal disorders who require surgery.[4]

Table 1: Definition of low birthweights

Birthweight: The first weight of the newborn obtained after birth (ideally within one hour of delivery)[5]	
Low birthweight (LBW)	<2.5kg
Very low birthweight (VLBW)	<1.5kg
Extremely low birthweight (ELBW)	<1.0kg

BREAST MILK

When an infant can tolerate milk, breast milk should be the recommended choice of feeding for a preterm infant. Breast milk offers many health benefits for premature infants, including providing antibodies to help mature the infants gut and immune system, along with reducing the risk of NEC.[7]

If an infant is under 35 weeks gestational age, or too immature to suckle, a mother can express her breast milk and the infant can be fed via an orogastric or nasogastric tube which goes directly into the stomach from day two of life.

REFERENCES

Please visit the Subscriber zone at NHDmag.com

Once the infant is mature enough to suckle, tube feeding may continue whilst the infant is learning to breastfeed, or bottle feed, to ensure sufficient nutrition.

According to the GOSH clinical guidelines:[6]

- Preterm infants who weigh more than 1.5kg should receive 150ml/kg to 220ml/kg of expressed breast milk. Feed volume should be maximised before considering the addition of a breast milk fortifier. Infants receiving unfortified expressed breast milk should receive multivitamin drops, iron, folic acid, phosphate and sodium supplementation. Serum calcium should be monitored and supplements should be provided if necessary.
- Preterm infants who weigh less than 1.5kg will not be able to meet their nutritional needs using expressed breast milk alone.[7] For these infants, expressed breast milk should be fortified to increase the protein content, along with the addition of vitamins and minerals.
- Breast milk should be fortified with a breast milk fortifier specifically designed for preterm infants. Infants should be tolerating 150ml/kg for expressed breast milk for 48 hours before starting a breast milk fortifier.
- If an infant is at term, weighs more than 2.5kg, but is not meeting growth expectations, a standard infant formula powder may be used to fortify feeds.

PRETERM FORMULA

A mother's milk supply is not affected by premature birth. However, having a preterm infant can increase stress and fear for a mother which can lead to difficulties in milk production. If a mother cannot breastfeed, or if a mother chooses not to breastfeed, a specialist ready-to-feed preterm formula should be used.[8]

A preterm formula should be used in all infants who are less than 2kg in weight and under 35 weeks gestational age and not receiving breast milk. These formulae have been specifically developed to meet the additional nutritional needs and metabolic requirements of preterm infants. Therefore, an infant who is receiving 150ml/kg/day of preterm formula does not need the addition of vitamin and mineral supplementation.

A preterm formula should be used until the infant has reached a body weight of 2-2.5kg and/or discharged.[6] Depending on the infant's growth at discharge, a nutrient-rich post-discharge formula may be used until three months corrected age, or potentially longer. It is important that growth restricted infants are monitored and assessed by a paediatric dietitian.

GROWTH MONITORING

Weight gain is an important marker for preterm infants, showing optimisation of nutrition and growth. UK-WHO growth charts for Neonatal and Infant Close Monitoring (NICM), formally known as the Low Birth Weight chart, have been developed to plot the weight of preterm infants from 23 weeks gestation to two years corrected age.[9]

The management of adequate delivery of energy and protein is really important to ensure growth thriving. However, accelerated growth in preterm infants should be avoided as it can lead to negative long-term health outcomes.[10]

As well as measuring and plotting the infant's weight three times a week and length and head circumference weekly, weekly monitoring of serum sodium, potassium, phosphorus, calcium, urea and creatinine, C-reactive protein (CRP), haemoglobin (Hb) and urinary sodium is also required for nutritional assessment. If the infant is receiving parenteral nutrition, routine blood measurements are also essential.[11]

Indications for inadequate growth include:[6]

- consistent weight loss over several days (other than when diuresis is expected);
- weight, length and/or head circumference velocity decreases over one week;
- weight velocity alone decreases over two weeks.

CONCLUSION

Appropriate nutrition for growth and development is fundamental for preterm infants, with any inadequacy in delivery of the correct nutrients potentially implicating long-term health. It is important that healthcare professionals monitor growth and adjust the nutrition accordingly, to ensure optimal development for preterm infants.