



Infant nutrition in the first year of life

Part Two

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In the second part of our series looking at infant nutrition in the first year of life, Dearbhla Hunt discusses common feeding issues in the first year of life and weaning.

Importance of early nutrition

The first year of life is a time of rapid growth and development. The infant's weight doubles in the first six months of life and triples in the first year whilst length doubles within the first year of life. During infancy, nutrient requirements per kg of body weight are higher than at any other time of life.¹ Appropriate nutrition is essential to support the infant's growth during this critical time in order to prevent stunting and wasting. Furthermore, research has shown that poor nutrition in the early months of life has long term implications. Neurological development, immune function, bone health, metabolism and cardiovascular health are all linked to early development and optimal nutrition in the early months of life.² Whilst infants are born with stores as a result of pregnancy, these stores can be quickly depleted unless an adequate supply of nutrients is provided. Recommendations for nutrient requirements are set out by the Food Safety Authority of Ireland (FSAI).³

Common feeding issues in the first twelve months of life

Constipation

Constipated stools are firm, dry and pellet like. While constipation can result in less frequent bowel motions compared to normal, it is the consistency or the hardness of the stool that is the most important factor in determining whether an infant is constipated.

Causes of constipation

Dietary change – weaning diet or change of formula milk or introduction of formula milk to a previously breast fed infant
Inadequate fluid intake – < 6 months : 150mls /kg per day, > 6

months: 120mls/kg per day

Incorrect feed preparation – if the feed is over concentrated this can be a cause of constipation

Cows milk protein allergy – rare cause of constipation but should be considered in infants who develop chronic or persistent constipation following the introduction of cows milk based formula in a breast fed infant and where the constipation fails to respond to conventional treatment. A milk free diet should only be instigated under medical and dietetic supervision.

Dietary treatment for constipation

Infants < 6 months

Offer 30 – 60mls cooled boiled water once or twice a day depending on the age of the infant. Brown sugar or diluted apple or pear juices may need to be added if the constipation does not resolve. The addition of brown sugar to the bottle is a temporary once off emergency measure for constipation. Once the infant has had a large bowel motion, the dose of brown sugar must be reduced in gradual stepwise fashion before stopping it altogether.¹⁵

Infants > 6 months

Offer 60 – 120mls freshly drawn tap water twice a day. Offer stewed pear, plums, mango or apple once or twice per day. Dried fruits such as prunes or apricots can be boiled in water or soaked in orange juice and pureed. If constipation fails to improve 60 – 120mls diluted apple or pear juice twice a day may be offered (i.e. 1 part juice to 1 part water).

Note 1: It is recommended not to give juice to an infant but the treatment of constipation is an exception to this rule. Juice given as a

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treatment for constipation is at a much stronger concentration than that recommended for juice offered as a drink and it should only be given until the constipation has resolved.

Note 2: *Sugar is a remedy for constipation that has been recommended by leading child health experts over many years. It works by drawing additional fluid into the infants bowel to soften the stools. Brown sugar should not be used as a treatment for constipation if an infant is not taking enough fluid as it could cause dehydration.*

In infants with persistent constipation (i.e. lasts longer than 2 weeks) consider a trial on Cow and Gate Comfort or Aptamil Easy digest formula milks. These formulas contain both prebiotics and a special fat blend which have been shown to give a softer stool.

Gastro oesophageal reflux

Simple gastro-oesophageal reflux (GOR) is common in the first year of life affecting up to 50% of infants. GOR is defined as the passage of gastric contents into the oesophagus with or without regurgitation and vomiting.

The dietary management includes ensuring that feed preparation and volume are appropriate. If the infant is gaining weight and is otherwise well, no further intervention is indicated. If the reflux is causing problems, offering the infant an anti reflux/regurgitation formulae or thickened standard infant formula milk may be indicated.

Lactose intolerance

Lactose is a disaccharide found in cow's milk and cow's milk based formula milks. It is digested in the small intestine by the brush border disaccharidase, lactase. Low or absent lactase enzyme activity leads to an intolerance of lactose (milk sugar). The most common cause of lactose intolerance (LI) in infants is due to damage of the epithelium of the small intestine caused by infections (i.e. rota virus) resulting in gastroenteritis. This can result in a transient lactose intolerance or secondary lactose intolerance. LI

is reversible once the underlying condition is treated. Infants with LI caused by gastroenteritis, with no or only mild dehydration, can safely continue with breast or standard cows milk lactose containing formula without any adverse effect on outcome (16). Lactose free formula is only recommended for the management of LI where a standard cows milk based lactose containing formula worsens the symptoms of diarrhoea and abdominal discomfort.

LI and non IgE mediated cows milk protein allergy can be confused due to symptom overlap. Differentiating between the two is vital in initiating the correct treatment of symptoms. Lactose free formulas contain cows milk protein and must not be used in the management of CMPA.

Cows milk protein allergy

Cows milk protein allergy is estimated to affect between 2 – 5% of infants.¹⁷ In high risk groups such as infants with early onset (< 3 months), moderate to severe eczema, it can be as high as 25%.¹⁸ CMPA can present in the exclusively breastfed infant as well as the infant taking a cows milk based infant formula. It can also develop when mum is weaning off breast feeds and changing over to a cows milk based formula milk or when spoon feeds are introduced into the diet. CMPA can present as IgE mediated or non IgE mediated. IgE mediated CMPA is acute in onset of symptoms usually within minutes or up to two hours following ingestion of the milk protein. Symptoms include urticaria, angioedema and anaphylaxis. Skin prick tests (spt) or specific IgE blood tests are useful in confirming the diagnosis.

Non IgE mediated CMPA has a more delayed onset with symptoms occurring hours or days after exposure to the milk protein. The symptoms are more often linked with the gastrointestinal system (i.e. loose stools, mucus in the stools, abdominal pain, GOR, constipation) in addition to food refusal or aversion, pruritis, atopic dermatitis and faltering growth. Non IgE mediated CMPA is difficult to diagnose given the range of symptoms and the overlap with other conditions such as lactose intolerance. SPTs or specific IgE blood tests are of no benefit in aiding the diagnosis and should not be routinely completed in this group of infants. A recent study highlighted that non IgE mediated CMPA is under diagnosed or the diagnosis is delayed in the community, as well as incorrect prescription of an appropriate substitute formula and referral to appropriate services for management advice.¹⁹ Dietary elimination of the allergen (i.e. milk protein) with resolution of symptoms followed by reintroduction with return of symptoms is the key to diagnosis of non IgE mediated CMPA.

Breast milk is the milk of choice for infants with CMPA irrespective of etiology and it should never be stopped as a result of a diagnosis of CMPA. Management should focus on the maternal diet and only if symptoms persist, should an alternative milk substitute be introduced. Amino Acid based formulas are the preferred formulas of choice in this group of infants. If an infant reacts to a cows milk based formula milk, an extensively hydrolysed formula milk with or without lactose is recommended. All infants diagnosed with CMPA must be referred to a dietitian so that advice can be given regarding the formula of choice and how to manage a milk free weaning diet. Home based food challenge or hospital based challenge will be determined by initial clinical presentation and SPT or specific IgE levels.

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Weaning

Weaning is a gradual process of introducing solid foods into the diet so that by 12 months the diet includes family foods and the infant is participating in family mealtimes.

When should weaning commence

The European Society of Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) committee states that complementary feeding should not be introduced before 4 months (17 weeks) and not later than 6 months (26 weeks).²⁰ FSAI 2012 recommend that spoon feeds for bottle and breast fed infants should occur around 6 months.

Update on gluten in the weaning diet

FSAI 2011 recommends the introduction of very small amounts of gluten close to 6 months of age and ideally while breast feeding. It further states that gluten should not be delayed beyond 7 months and that under no circumstances should an infant be exposed to gluten before 4 months (17 weeks).

Fish and eggs

There is no convincing scientific evidence that avoidance or delayed introduction of potentially allergenic foods such as fish and eggs reduces allergies either in infants considered at risk for the development of allergy or in those not considered to be at risk.²⁰

Peanuts

The results of the Learning Early about Peanut Allergy (LEAP) study report that early sustained consumption of peanut products (> 4 months but < 11 months) significantly decreased the frequency of the development of peanut allergy among children at high risk for this allergy.²¹ Conversely, peanut avoidance was associated with a greater frequency of clinical peanut allergy than was peanut consumption, which raises questions about the usefulness of deliberate avoidance of peanuts as a strategy to prevent allergy. Further studies are required and are currently on –going in order to establish if protection against peanut allergy is maintained following cessation of peanut consumption in this patient group.

Conclusion

Infancy is a critical period during which nutrition plays an important role. If a good dietary foundation is put in place, it will enhance health throughout life.

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