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Scientific Advisory Committee on Nutrition

Subgroup on Maternal and Child Nutrition (SMCN)

Paper for discussion: Introduction of solid foods

Agenda item: 3

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INTRODUCTION OF SOLID FOODS

Issue

1. Following the recommendation that exclusive breastfeeding is recommended for the first 6 months of life. Advice is sought on the timing of the introduction of solid foods to infants who are mixed fed or who are fed on infant formula milk only.

Background

World Health Organisation (WHO) Action

3. WHO undertook a systematic review on the Optimal Duration of Exclusive Breastfeeding, which was completed in April 2001. The WHO expert committee recommended that exclusive breastfeeding for six months was not associated with growth faltering at the population level, and was beneficial to infant health in both developing and industrialised countries. The conclusions and the recommendations of the WHO review on the duration of exclusive breastfeeding were incorporated into the WHO Global Strategy for Infant and Young Child Feeding. The UK supported the WHO strategy and the global recommendations.

SACN Endorsement

4. The above recommendation was endorsed by SACN in September 2001. SACN agreed that there was sufficient scientific evidence that exclusive breastfeeding for 6 months is nutritionally adequate but that due to current practices in the UK there should be some flexibility in the advice. SACN agreed that the available evidence did not support the often-reiterated theoretical concern that between 4 –6 months, breast milk was inadequate to support normal infant growth.

Department of Health Recommendation

5. The Minister for Public Health, Hazel Blears announced the following recommendation on breastfeeding on the 12 May 2003.

“Breastmilk is the best form of nutrition for infants. Exclusive breastfeeding is recommended for the first 6 months (26 weeks) of an infant’s life, as it provides all the nutrients a baby needs. Breastfeeding and/or breastmilk substitutes, if used should continue beyond the first 6 months along with appropriate types and amounts of solid foods. Mothers who are unable to, or choose not to, follow these recommendations should be supported to optimise their infants’ nutrition.”

6. The COMA report ‘Weaning and the Weaning Diet’ (1994) recommended that:

“Breastfeeding is the best form of nutrition for infants. Mothers should be encouraged and supported in breastfeeding for at least four months and may choose to continue to breastfeed as the weaning diet becomes increasingly varied. The majority of infants should not be given solid foods before the age of four months, and a mixed diet should be offered by the age of six months”.

7. COMA in 1994 recommended that solid foods should be introduced between the ages of 4 – 6 months, emphasizing most of the body’s systems are maturing and growing rapidly at this age and the timing and rate of weaning should take account of considerable individual variation. COMA stated that the working group found only limited information on which to base recommendations for best weaning practice. Concluding that weaning too early or too late can result in behavioural and health problems and in family stress, COMA stated that:

‘Weaning should not start before neuromuscular coordination has developed sufficiently to allow the infant to eat solids, nor before the gut and kidney have matured to cope with a more diverse diet.’

8. On a practical basis, practitioners understood this policy to mean that infants should be introduced to solids food at 4 months (16 weeks). Although COMA clearly intended a more

flexible approach to weaning based on the physical and developmental individual needs of the infant. Data from the last National Infant feeding Survey (2000) suggested that many babies are introduced to solid food earlier than was recommended. Almost a third of British mothers commence solid foods at exactly 16-weeks.

9. Current Weaning Practice in the UK

Table 1 Proportion of all infants and age of introduction of solid food in UK.

Age of introduction of Solid Food	% Giving solid Food
Before 16 weeks	49%
Between 16 – 26 weeks	49 %
After 26 weeks	2%

(National Infant Feeding Survey 2000).

Table 2. Proportion of infants introducing solid food by method of milk feeding in UK.

Age of Introduction	Breastfed	Formula Fed
13 weeks	12%	28%
17 weeks	79%	88%

(National Infant Feeding Survey 2000)

10. Solid foods should not be introduced before attainment of adequate oral and neuro-muscular co-ordination and before the gut and kidneys have matured to cope with a more diverse diet. Early introduction of solids can also reduce the absorption of nutrients from breastmilk. Solid food given close to a breastfeed reduces the bioavailability of iron from

breast milk because inhibitors present in the food can bind the iron from breast milk in unabsorbable complexes.

Discussion

11. The issues surrounding the timing of the introduction of solids frequently fall into the following categories: effects on health and growth, oral-motor development and anecdotal beliefs.

Health and Growth

12. In January 2002, a Cochrane review (Kramer and Kakuma, 2002) on the optimal duration of exclusive breastfeeding was published. This concluded that there was no objective evidence of a “weanling’s dilemma” in developing countries, which refers to “*the choice between the known protective effect of exclusive breastfeeding against infectious morbidity and the (theoretical) insufficiency of breast milk alone to satisfy the infant’s energy and micronutrient requirements beyond four months of age.*”. No problems with growth were observed in either developing or developed countries for baby’s breastfed for six months or longer. However, it is recognised that individual infants differ in their growth and development.

13. The results of a large randomised trial in Belarus (Kramer et al, 2002) confirmed that exclusive breastfeeding for six months considerably reduces the risk of gastrointestinal infection. No effect on the incidence of eczema was observed in this study, though others have noted a reduction in the risk of atopic conditions.

14. The Cochrane review concluded that the data on iron status were conflicting but suggests that there may be a need for iron supplementation where newborn babies have sub-optimal levels. A study in Honduras (Dewey et al 1998) found infants with a birth weight greater than 3kg who were exclusively breastfed for 6 months did not have ferritin values. They concluded the risk of iron deficiency is low among infants with a birth weight greater than 3kg who are exclusively breastfed for six months. Formula milk has additional iron and minerals added to allow for reduced bioavailability. However, the age at which infants are introduced to solid food is only one factor influencing the prevalence of anaemia; anaemia in the mother and routine early clamping of the umbilical cord are also predisposing factors. (Mercer, 2002).

15. Longitudinal studies have indicated risks of eczema, wheeze and latent heart disease in childhood if solids are started early. One Scandinavian study found that not giving solid foods before six months to children from atopic families greatly reduced the risk of eczema at 12 months (Kajosaari and Saarinen, 1983). The Dundee Infant Feeding Study found that solids introduced before 15 weeks increased the probability of wheeze during childhood and was associated with an increased percentage of body fat and weight in childhood (Wilson, et al. 1998).

16. There is little research on the timing of the introduction of solid food to infants who are fed on infant formula milk. One randomised study in the US (Mehta et al, 1998) found that when solid food replaced formula, there was no net increase in energy intake, regardless of when solids were introduced, at three months or six months. There is no growth advantage in starting solids early or at six months. A further randomised study in California concluded that solid food given before 6 months of age generally replace the milk source among breastfed infants but not amongst those infants receiving infant formula milk (Heinig et al, 1993).

Oral-motor Development

17. Reviews of the literature on three aspects of the developmental readiness of babies for solid foods with respect to physiological maturing were published in April 2001 (Wellstart, 2001). These aspects were development of the baby's immune system, maturation of the gastrointestinal tract and oral development in relation to coping with the transition from a purely liquid diet to semi-solid and solid foods. Suppression of fertility in the mother as a result of breastfeeding was also considered. The expert review team concluded that although there is a great deal that is still not known, most full term babies are probably ready to start solids near six months or perhaps a little beyond.

18. Concern is sometimes expressed that babies will not learn to chew if the introduction of solids is later than six months. This 'window of opportunity' idea appears to have arisen from an old paper presenting case studies of children who remained on a liquid diet for over 6 months, some of whom had developmental delays or disabilities (Illingworth and Lister, 1964). A hypothesis was suggested that 'if children are not given solid foods to chew at a time when they are first able to chew, troublesome feeding problems may occur.' This has since been quoted as evidence and inappropriately extended to babies with normal development

19. Stevenson and Allaire (1991) suggest the conventional practice of progressing from liquids to semi-solid or pureed foods to solids must be recognised as a belief that is not supported by empirical data. Other cultures do not dwell on transitional feeding but continue breastfeeding or infant formula milk and wean straight onto solid foods.

20. Spoon-feeding begins for most infants at around 5 months of age. Active spoon feeding with the upper lip moving down to clean the spoon emerges at 6 months. Refinement of tongue activity during the swallow of these strained foods is noted at 9 months with up and down tongue movement. Lip closure during swallowing appears at 12 months and resembles mature feeding behaviour (Stevenson and Allaire 1991).

Beliefs

21. There is no evidence to support the idea that starting solids at around six months is more likely to be associated with the baby being a fussy eater. Indeed, a randomised comparison of breastfed babies started on solids at either four months or six months in Honduras found no difference in appetite or food acceptance as reported by the mothers (Cohen et al 1995).

22. Anderson et al (2001) held focus group discussions with mothers to try to identify the range of maternal attitudes and beliefs that influence the timing of introducing solid foods. Mothers who had started their babies on solids believed their babies had shown behaviour indicating readiness. They were also aware of the recommendation to wait until four months but did not know the reasoning behind this. There was little appreciation of the risk of long-term ill health.

23. It is common for mothers to believe that giving solid foods will help their baby to sleep longer at night. Heinig et al (1993) reported virtually identical sleeping times (729 versus 728 min/day).

24. It is clear that mothers and health professionals have to date focused on the age of the infant when considering the optimum time to introduce solid foods rather than the individual physical and developmental needs.

25. Members are requested to advise on:

- Should the age of weaning be dependent on developmental readiness rather than infant's age?
- If there are any risks associated with delaying of weaning to 6 months in bottle-fed babies.

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