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Formula feeding

Infant feeding: is the twelfth series of 'Midwifery basics' targeted at practising midwives. It aims to provide information to raise awareness of the impact of the work of midwives on women's experience and encourage midwives to seek further information through a series of activities. In this sixth article Joyce Marshall considers issues related to formula feeding.

Introduction

Most parents have one thing in common; they all want their children to be healthy and happy and in the early days after birth infant feeding is a major part of the care of the baby as women make the transition to motherhood. However women choose to feed their baby they like to think they are doing the right thing for both their baby and themselves. Although women have breastfed their babies for millions of years and it is after all what defines us as mammals, in the 21st Century in many countries bottle feeding with formula has become so common that it is perceived by many people as the normal way to feed babies. Everyday worldwide women make choices about infant feeding and these choices should be underpinned by accurate knowledge so that women and families can evaluate risks and benefits of the different options. Whilst formula may be nutritionally adequate for growth of human babies it cannot be considered to be equivalent to breast milk. Breast milk is much more than nutrition; it is a complex living fluid that both nourishes and protects against disease as it has all the nutrients for optimal growth and development, a host of immunological factors such as macrophages and lymphocytes and transfer factors that aid the digestion of micronutrients such as iron.

Scenario

Sadie has recently returned home from hospital and is breastfeeding her baby Tom. She has already had a visit from her mother who has undermined her confidence by telling her that she is 'probably not feeding Tom enough or that her milk is not strong enough' because he is feeding often. Sadie is now not sure whether to carry on breastfeeding – after all she and her three brothers are all very healthy and they were all fed formula. She looks down at baby Tom who is lying in her arms gazing up at her face and says 'I just want you to grow, be strong, healthy and happy'. Sadie decides she will ask the community midwife when she visits later in the day.

The neonate's gut and infant feeding

Before birth a baby's gut is sterile. Colonisation with bacteria is a complex process that starts during birth and is most affected by mode of birth and type of infant feeding (Penders *et al.* 2006). If a baby is born vaginally the gut is colonized by bacteria from the mother, however, if a baby born by caesarean their gut is more likely to become colonized with bacteria from the environment (Walker 2011).

Intestinal bacteria are important to health as they provide a barrier to the colonization of pathogens and they stimulate the development of an infant's immune system (Penders *et al.* 2006). There are major differences in the gut flora of breastfed and formula fed infants. When a baby is breastfed the gut is much more acidic (pH of 5.1 – 5.4 compared to 5.9 – 7.3 in formula fed infants), has high levels of bifidobacteria which are important beneficial bacteria and fewer potentially harmful bacteria such as *E.*

coli, and *Streptococci* (Morelli 2008, Walker 2011). When infants are given supplements of formula during the first 7 days of life the infant's gut becomes more like the gut of a formula fed infant in that the gut becomes more alkaline and the percentage of bifidobacteria decreases (Walker 2011). At birth an infant's gut mucosa is immature and the intestine is permeable to proteins and pathogens. The process of maturation takes many weeks but occurs much more quickly when an infant is exclusively breastfed. Antibodies in colostrum and breast milk coat the gut providing protection whilst the gut is immature (Walker 2011). Mothers produce specific antibodies when they either ingest or inhale pathogens and when an infant breastfeeds these are ingested and will bind to the pathogen in the infant's gut so preventing disease. Therefore if mother and baby stay together they will be exposed to the same pathogens and the baby will be protected. However, feeding formula to a baby interferes with this mechanism and the baby is not protected (Walker 2011).

The risks of formula feeding

Babies in developing countries who are not breastfed are likely to be less healthy and have a higher risk of dying in infancy (WHO Collaborative Study Team on the Role of Breastfeeding on the Prevention of Infant Mortality 2000). Most women in the UK (82%) are aware of at least some of the short and long-term health consequences for babies who are not breastfed (McAndrew *et al.* 2012). These include a higher risk of being ill with diarrhoea, otitis media or lower respiratory tract infections (Ip *et al.* 2009, Quigley *et al.* 2007). Quigley *et al.* (2007) measured the effects of breastfeeding on admissions to hospital using the Millenium Cohort Study (15,890 healthy singleton term infants born in 2000 – 2002) and estimated that 53% of hospitalizations for diarrhoea and 27% for lower respiratory tract infections could have been prevented each month if all infants were exclusively breastfed.

Several reviews of the evidence for longer term health outcomes for both mother and baby have been conducted. These suggest that not breastfeeding increases a mother's risk of developing breast cancer, ovarian cancer, type 2 diabetes and postnatal depression (Hoddinott *et al.* 2008) and infants who are not breastfed have increased risk of high blood pressure, obesity, type 1 and type 2 diabetes, childhood leukaemia, sudden infant death syndrome, necrotising enterocolitis and atopic dermatitis and asthma (Hoddinott *et al.* 2008, Ip *et al.* 2009).

Activity 1

Consider what information about breastfeeding and formula feeding you think women might be most interested to know. Do you think this is most likely to be health related? Access a website such as www.mumsnet.com and have a look at the conversations about infant feeding choices and support. Consider how you can provide accurate information about infant feeding in a way that is helpful to women.

Trends in infant feeding in the UK

The World health Organization (WHO) recommends that women continue to breastfeed their infants for two years having exclusively breastfed for six months (World Health Organisation 2003). Breastfeeding rates in the UK are amongst the lowest in Europe and the most recent infant feeding survey showed that

although more women were breastfeeding at all time points in the UK only just over a third (34%) were breastfeeding when their baby was six months of age (McAndrew *et al.* 2012). Only 23% of women were exclusively breastfeeding when the baby was six weeks old (McAndrew *et al.* 2012).

More women in managerial and professional occupations, those over 30, and those who left education after 18 years choose to breastfeed their babies (McAndrew *et al.* 2012); a continuing trend noted in previous infant feeding surveys (e.g. Bolling *et al.* 2007). This has changed over time however, as prior to the industrial revolution more women from lower social classes breastfed (Palmer 2009).

Formula feeding

Some women choose to feed their baby formula milk for a variety of reasons and just a few women are not able to breastfeed; it is important that these women are given the information they need and feel well supported. This involves showing mothers how to sterilize feeding equipment effectively and how to make up formula feeds correctly. Most formula milks are made from cows' milk and are modified to make them suitable for babies. A range of different milks is available and it is important that parents know which one is suitable for their baby at which age. First milks are for newborn babies and are whey based to aid digestion (whey: casein ratio is 60:40). When a mother has chosen not to breastfeed first milk should be fed to a baby until six months of age and can be continued as solids are introduced until the infant is one year (UNICEF UK 2010). Second milks are casein dominant (whey casein ratio 20:80) and are therefore more difficult to digest. These are marketed for hungry babies and although they can be given to newborns this is not usually recommended (Pollard 2012). Follow on milks are marketed for babies over 6 months (and must not be given to babies before 6 months) but there is no evidence of any benefits to infants from having this milk rather than first milk so these milks are not recommended (SACN (Scientific Advisory Committee on Nutrition) 2007).

The 2010 Infant feeding survey demonstrated that less than half of mothers in the UK made formula feeds as recommended – that is only making one feed at a time, making feeds within 30 minutes of the water boiling and putting the water into the bottle before the powder (McAndrew *et al.* 2012). This suggests that women may not always be given the information they need to ensure safe formula feeding.

Activity 2

Read - The health professional's guide to: "A guide to infant formula for parents who are bottle feeding" at: http://www.unicef.org.uk/Documents/Baby_Friendly/Leaflets/health_professionals_guide_infant_formula.pdf
A step by step guide to making up bottle feeds can be found at: <http://www.dh.gov.uk/health/2011/08/formula-feed/>

The International Code of Marketing of Breastmilk Substitutes (The code)

The International Code of Marketing of Breastmilk Substitutes was adopted by the World Health Assembly in 1981 to protect and promote breastfeeding by providing adequate information on infant feeding and by the regulation of marketing of breastmilk substitutes. It applies to governments and companies. The code advocates breastfeeding and if babies are not breastfed that they should be fed by the next best alternative. So formula should be available if needed but not be promoted. In summary: formula companies should not promote their products to the public, they should not provide free samples or gifts to mothers or to health workers, any information provided to health workers should be scientific and factual and not be misleading and all formula milk labels should state the benefits of breastfeeding and the risks of formula feeding and should not have pictures of babies or language that idealises the use of the product.

Activity 3

Read the code in full at: http://www.unicef.org/nutrition/files/nutrition_code_english.pdf Not all countries have adopted the code fully and made it law - a list of the countries where the code has become law or partially implemented can be found at:

http://www.unicef.org/nutrition/files/State_of_the_Code_by_Country_April2011.pdf

UNICEF Baby Friendly Initiative

The Baby Friendly Initiative is a worldwide programme that started in 1992 to encourage maternity hospitals to practice in accordance with the code and implement the ten steps to successful breastfeeding. In 1998 this was extended to community healthcare provision through introduction of the seven point plan. The best practice standards set out in these ten steps and the seven point plan are seen as the minimum standard and are recommended in the postnatal NICE guideline (NICE 2006). Following extensive consultation, new standards have recently been launched. These incorporate the ten steps and seven point plan but update and expand them to incorporate recent evidence.

Activity 4

Access the full guide or the quick guide for the new standards at:

<http://www.unicef.org.uk/BabyFriendly/Health-Professionals/New-Baby-Friendly-Standards/> consider how this might affect your practice. Evidence of the effectiveness of the Baby Friendly Initiative worldwide is accumulating and there have been several UK studies. These can be found at:

<http://www.unicef.org.uk/BabyFriendly/News-and-Research/Research/Baby-Friendly-Initiative/>

Reflection on the scenario

Sadie's experience is not uncommon. If you were the community midwife visiting Sadie that day what information would you give her? Are there any strategies she might use to cope with potentially unhelpful comments from her mother? Might she benefit from meeting with other breastfeeding mothers? What information might she need about formula feeding?

Conclusion

Midwives have a responsibility to give women accurate evidence-based information about both breastfeeding and formula feeding and this should include a discussion about the risks of formula feeding. If a woman decides she wishes to formula feed she should be fully supported and this should include showing her how to make up feeds correctly and giving information about different types of formula feeds taking care not to contravene the code.

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