Breastfeeding and dental health
By Joanna Doherty, NCT breastfeeding counsellor

What are the issues around tooth decay in early childhood?

Tooth decay can be a significant issue for children and their families, causing chronic pain, as well as difficulties with sleep, eating and weight gain. In the most severe cases, it begins soon after teeth eruption and progresses rapidly. This can lead to the removal of multiple teeth under general anaesthesia at a young age. A recent large-scale survey by Public Health England found that 12% of 3 year olds in the UK had tooth decay in their primary (baby) teeth.

NICE guidelines indicate that dentists should provide patient-centred care when discussing tooth decay with parents. However, dentists and other health professionals view tooth decay as a disease that is almost always preventable, resulting in some parents feeling blamed. Mothers who are breastfeeding have reported feeling under pressure to stop feeding and warned that, if they continue, their child will develop tooth decay (see summary of mother’s experiences by Hannah Lynes in this issue).

This piece examines the evidence for causes of tooth decay in early childhood, with a particular focus on the evidence that breastfeeding can be a cause of tooth decay. The aim is to provide practitioners with information to support parents who are working their way through decisions about feeding and dental health.
What causes tooth decay?

For dental caries (the medical term for tooth decay) to form, there needs to be two elements present in the mouth over a period of time: cariogenic bacteria and simple carbohydrates (in the form of free sugars). Cariogenic bacteria are bacteria that cause caries by ingesting sugars and then releasing acids as they process this sugar. Over time, this acid then eats away at the tooth enamel (demineralisation). However, this is not necessarily an irreversible process, as tooth enamel can be remineralised (effectively regrown) from components found in the saliva. Caries only begin to form when the process of demineralisation is faster than the process of remineralisation. The severity of caries correlates, amongst other things, with the frequency of sugar intake, rather than the overall quantity of sugar consumed.

In order to help prevent caries, the cariogenic bacteria themselves, or the sugar they digest, need to be removed from the mouth. Aside from not consuming sugars, regular oral hygiene helps to prevent caries by both removing food particles from the teeth and disrupting the formation of plaque (which is a layer of cariogenic bacterial cells linked together to form a ‘biofilm’ covering the surface of the teeth).

What is early childhood caries?

Early childhood caries (ECC) is a term referring specifically to decay in the primary (baby) teeth. These teeth usually begin to erupt between 6-12 months of age. Prenatally, a baby’s mouth, like the gut, is a sterile environment. It is colonised by bacteria from birth onwards, leading to the formation of an oral microbiome. The likelihood of ECC appears to be partly correlated with the age at which a child’s oral microbiome is colonised with cariogenic bacteria. The earlier this occurs, the more likely a child is to develop ECC.

Furthermore, a child’s risk of developing ECC differs depending on how vulnerable their teeth are to attack. There is now research which suggests that a portion of the risk of developing ECC may be genetic. As an example, tooth morphology, which is part genetically determined, affects the likelihood of developing caries, as they form more easily in sheltered environments (ie teeth with lots of pits and crevices). The ability of tooth enamel to remineralise, and hence, prevent caries formation, may also be dependent partly on genetic factors.

Finally, small numbers of children who suffer from enamel defects such as hypoplasia (thinner/less enamel) are also more likely to develop ECC. As well as being associated with various genetic and/or systemic conditions, these enamel defects are affected by environmental factors/events in the perinatal period (when the tooth enamel is being laid down). Malnutrition, vitamin D deficiency, traumatic and premature birth have all been implicated in the development of hypoplasia, and hence, ECC.
How is ECC affected by infant feeding practices?

Although ECC tends now to be viewed as a complex, multifactorial disease, traditionally, the blame was laid at the door of infant feeding practices. Originally, ECC was called ‘baby bottle caries’ or ‘nursing caries’ because the development of ECC is much more likely if babies and toddlers have frequent access to cariogenic foods or liquids (eg bottles of formula or other liquids containing sugar). This is an even greater issue if they sleep with a bottle at night, as saliva production (which remineralises the teeth and counteracts the demineralisation) is lessened during sleep.9

An ongoing debate is whether breastfeeding is also linked to the development of caries in a similar fashion. Some argue that this is unlikely, as the biomechanics of breastfeeding are different from bottle feeding (eg the nipple lands at the back of soft palate and squirts milk to the back of the mouth, and milk is not released unless the baby is actively feeding).10 Others suggest that when babies sleep with the breast in their mouth the milk is held in contact with the surface of the teeth, and thus has the potential to increase the risk of ECC.

Furthermore, formula milk and human breastmilk differ greatly in composition, and formula milk appears to be considerably more cariogenic (ie more likely to cause caries).11 It has been postulated that the immunomodulatory factors found in human breastmilk may perform a similar role to that in the gut, by helping to establish an oral environment which is unfavourable to cariogenic bacteria. However, there is also limited evidence which suggests that although human breastmilk by itself may not be cariogenic, a mixture of sugar and breastmilk may be even more cariogenic than sugar solution alone.12

What does the evidence say about associations between breastfeeding and ECC?

Recent systematic reviews13 that assessed all available research qualitatively and (where possible) quantitatively, concluded that breastfeeding for up to twelve months is associated with a decreased risk of developing ECC, as would be expected from the composition of human breastmilk. This result held for those few studies which took into account confounding factors. Thus, the most reliable evidence we have at the moment suggests that not only is breastfeeding up to twelve months correlated with a decreased likelihood of ECC, it may even be protective.

By contrast, the overall evidence for the effect of breastfeeding beyond 12 months, although more mixed, appears to be correlated with an increased risk of ECC,13 particularly when there are certain infant feeding practices such as frequent feeding and nocturnal feeding/feeding to sleep.

Very few studies controlled for confounding factors. Beyond twelve months, even more confounding factors come into play, as the teeth most susceptible to ECC have usually erupted, and milk is no longer the main source of nutrition. For example, several studies which found a correlation between increased risk of ECC and frequent/nocturnal breastfeeding practices also found that these families were more likely to have diets which were higher in cariogenic food/liquid.13
Finally, the studies reviewed were carried out in different countries with varying socioeconomic conditions. Unlike the UK, in many low and middle income countries families who are lower down the socioeconomic scale are more likely to practise breastfeeding beyond 12 months (and associated feeding practices). Poverty is a strong risk factor: amongst families living in poverty, children may be more likely to suffer from malnutrition and hypoplasia; parents are more likely to have dental disease; and oral hygiene practices may be unaffordable.

Therefore, although breastfeeding beyond 12 months appears to be a risk factor for ECC, further research is needed to understand its significance compared to other possible confounding factors, the overall cariogenicity of the diet (ie the frequency of sugar consumption) and oral hygiene practices, as well as particular breastfeeding practices.

What are parents’ options if they are worried about the possibility of ECC?

- Visit a dentist as soon as the first teeth come through and by a child’s first birthday, and then at least once a year or as frequently as every three months if the child is at higher risk of developing ECC
- Introduce an open top or free-flow cup from six months
- Decrease their child’s risk of ECC through changes in behaviour

What behaviours decrease the likelihood of ECC?

- Consuming sugary foods/liquids less frequently
- Brushing teeth twice/day with a fluoridated toothpaste, especially just before bed and spitting, not rinsing after brushing
- Breastfeeding for up to twelve months
- Being careful about oral hygiene (eg not sharing food, toothbrushes or cutlery)

What behaviours might decrease the likelihood of ECC in children breastfeeding beyond 12 months?

- Breastfeeding less frequently or keeping feeds to mealtimes
- Breastfeeding only in the day and not feeding to sleep
- Cleaning teeth thoroughly before nocturnal breastfeeding

How can practitioners support parents?

Do

- Remember that parents sometimes report feeling guilty or blamed after interactions with health professionals about their child’s (possible) tooth decay.
- Use a person-centred model of counselling skills to interact with parents.
- Provide parents with information about the multifactorial nature of tooth decay and the reliability of the evidence if appropriate.
- Support parents to explore their options and decisions.
- Signpost to a dentist when appropriate, reminding parents that dental care for children is free and that taking children for a check-up as soon as their first teeth erupt helps to accustom them to the routine.
Don’t
• Blame parents for their child’s tooth decay.
• Advise parents on the likelihood of tooth decay for their child.
• Advise parents on what course of action they should take.

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See accompanying pieces in this issue by NCT breastfeeding counsellor Hannah Lynes, ‘Mothers’ experiences of talking with dentists about breastfeeding’, and consultant paediatric dentist Claire Stevens, ‘Treating children with decayed baby teeth: a dentist’s point of view’.

References