Practice Information Sheet No. 9

Caries

CARIES CONCERNS IN ANTE AND POST NATAL CARE

Pregnancy and oral health

Pregnancy and the subsequent birth of a child provide the opportunity for the dental professional to have a profound impact on the future dental health of both the child and the family.

In some cases, pregnancy can increase the risk of caries development, therefore our concern should not only be for the dental health of the growing infant, but also for the mother during this important period of her life.

Dental professionals can help a new mother to become aware of the most common dental problems associated with pregnancy and show her the ways to avoid them.

Fathers should also be encouraged to maintain a good oral health during the pregnancy period, as this positive attitude to oral health is likely to be carried over to the growing infant.

1. The oral health of the expectant mother

Increased caries risks during pregnancy

During pregnancy women can experience increased risks of gingivitis, erosion and caries.

Prolonged vomiting can have an impact on caries progression. Nausea and vomiting have been recorded in 70% of pregnant woman. It usually begins between weeks 4 and 8 and finishes around week 16. Larsen (1973) and others have shown how caries progression can be accelerated when erosive factors are introduced into a carious acidic challenge. Gastric reflux (regurgitated gastric acids) or emesis (vomiting), bring HCl (pH 1-1.5) in direct contact with the teeth. While a good salivary flow is able to buffer the acid, any prolonged contact, particularly with incipient enamel lesions, will quickly dissolve the fragile surface causing progression of the lesion from non-cavitated to cavitated. The increased caries risk could be attributed to a number of factors such as:

- *Increased frequency of eating (grazing), and 'food fads';*
- *Reduced frequency of oral hygiene due to either tiredness, nausea on toothbrushing or a concern at the increased tendency for the gingivae to bleed on brushing.*

For some patients, who are at low risk of dental caries before pregnancy, caries risk during pregnancy may increase considerably. However, patients who are at high caries risk before pregnancy are very likely to develop new lesions.

Caries experience of expectant mother during pregnancy

Keeping dental caries under control during pregnancy presents a challenge in many cases, particularly where the caries risk has already been high, nausea/vomiting is a persistent problem and other pregnancy related dietary issues are present. In such cases the requirements are:

- *Maintaining good oral hygiene is essential. Good plaque control is usually enough to manage pregnancy gingivitis. However, if nausea is a problem while brushing, regular, short-term use of mouthrinse or gel containing Chlorhexidine should help to control gingivitis.*

Treating fathers and mothers-to-be and providing them with dental education create an opportunity for sound family-based dentistry.

- *Where caries prevention is of concern and regular toothbrushing results in vomiting, the use of fluoride gel (eg. 1.23% NaF) instead of toothpaste is another option. Fluoride gel contains very little sweetness and no foaming agent and is therefore particularly useful if toothpaste sweetness, taste or foaming is a problem.*

The risk of caries can be exacerbated during pregnancy.

Caries experience of expectant mother during pregnancy (continued)

- *Maintenance of a low sugar diet is very important. During pregnancy the frequency of eating may increase for a variety of reasons, for example to help control nausea, constant hunger or food fads, hence limiting the amount of sugar is an important strategy to prevent dental caries. A body of evidence is building up suggesting that the pH drop is less when dairy foods are included with a meal, therefore pregnant women should be encouraged to have some kind of dairy food (cheese or yoghurt) with snacks. It is important to remember that teeth are an integral part of the body, therefore all dental dietary recommendations should be kept in line with the general recommendations given to pregnant women by other medical professionals.*
- *Reflux or regurgitation results in a sour taste in the mouth that indicates that the pH in the oral cavity has dropped and become acidic. When that does occur, it is essential for the mouth to be rinsed out as quickly as possible. Toothbrushing should be discouraged immediately after vomiting to avoid unnecessary loss of softened or weaken enamel and to give demineralised enamel a chance to remineralise. With persistent reflux, vomiting or nausea, that prevents patients from brushing, more frequent dental checks are warranted to monitor for rapid caries progression or signs of frank erosion. Some dentists recommend using sugar free chewing gum containing xylitol to stimulate saliva and to reduce the MS count. However, there are no publications documenting the use of xylitol in pregnancy.*
- *Dental authorities no longer recommend prenatal fluoride supplementation due to the lack of proven effectiveness in reducing caries in child dentition. However, if the mother is diagnosed with high caries risk she should use additional fluoride products from early in the pregnancy. The concentration and frequency of use depends on the caries and erosion risk levels. If nausea is a problem, nightly use of a NaF gel, where possible, might be considered, however overnight trays are to be avoided as they may trap any regurgitated acids. Frequent use of a 0.2% NaF rinse would also be beneficial, especially after a sickness episode. Mothers at high risk of caries can also be advised to use high fluoride toothpaste and to 'spit and don't rinse' after brushing. This advice is likely to be readily accepted and complied with because it does not require patients to purchase and remember to use additional fluoride products.*
- *In more extreme cases of prolonged and frequent emesis, it may be necessary to coat the lingual surfaces of maxillary teeth in particular, with unfilled resin to protect them against the erosive acids.*

2. Factors affecting the baby during pregnancy

The importance of a healthy diet for the child's general and oral health

The mother's own health and nutrition during pregnancy can impact greatly on the baby's general and oral health. Although further research is needed, some studies indicate that low birth weight babies have an increased potential to develop periodontal disease later in life. The literature also seems to suggest that active periodontal disease in a mother can impact on the oral health of the infant.

Factors such as pregnancy toxaemia, prolonged or difficult delivery, uncontrolled diabetes, and a number of viral infections can contribute to enamel hypoplasia in an infant. Maternal medication during the first trimester of pregnancy has been also indicated as associated with increased risk of birth defects including cleft palate/lip formation (Queisser-Luft et al, 1996).

A large number of congenital disorders are due to excessive alcohol consumption during pregnancy (Tat-Ha C, 1990). These anomalies are also known as the "fetal alcohol syndrome". Data available on this subject leaves no doubt regarding the damaging effects of excessive prenatal alcohol intake. Babies born with fetal alcohol syndrome show characteristics such as pre- and post-natal growth retardation, cranio-facial dysmorphism and central nervous system abnormalities. Shaw and Lammer (1999) found that women who reported weekly or more frequent episodes of consuming >=5 drinks per drinking occasion had 3.4 times greater risks of orofacial clefts compared with those who did not report drinking alcohol. Smoking during pregnancy can also contribute to increased risk of cranio-facial abnormalities.

The dental professional often has the opportunity to contribute significantly in providing health information to expectant mothers during dental appointments. While the emphasis is usually on oral health, the dental professional should also attempt to take a special interest in general health promotion.

A recent study on oral health during pregnancy reported that most mothers did not go for dental care during their pregnancy and, among those who reported having problems, half did not get dental care. The study also described the implications of their findings for dental practice stating that attention to the oral health needs of pregnant women is warranted and that maternal oral health and perinatal outcomes could benefit from coordinated effort from the dental and obstetric communities (Gaffield et al, 2001).

3. Post Natal Care & Oral Health

Caries risk in early childhood

As soon as a tooth erupts into the oral cavity it is exposed to the oral environment and is at risk of developing carious lesions. The term currently used to describe caries that occur in the first three years of life is EARLY CHILDHOOD CARIES (ECC). However, ECC may take many forms depending on the aetiology. Some of the earlier terms used like Nursing Caries and Baby Bottle Caries describe different aetiologies which result in specific demineralisation patterns. Sometimes it takes the form of classical rampant caries (see Figure 1).

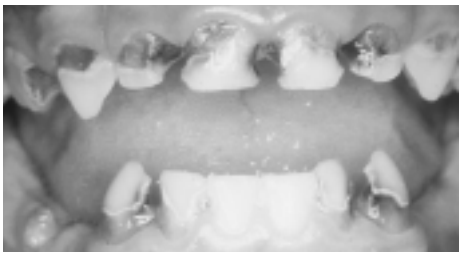

Figure 1: Rampant caries in deciduous dentition

In others, the demineralisation pattern is consistent with that seen in erosion (see Figure 2), involving etching of the labial or lingual enamel. However, often there seems to be a combination of both patterns. Reviewing the literature, Johnston and Brearley Messer (1994) have described the most common pattern of ECC that follows the eruption sequence of the teeth. This article also provides explanations for nursing caries and the various other patterns of demineralisation occurring in ECC.

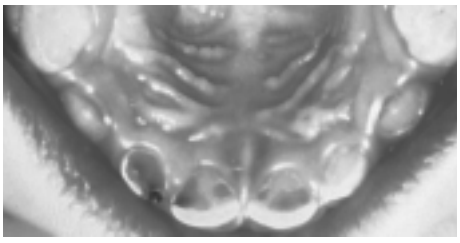

Figure 2: Combination of caries and erosion in deciduous dentition

Pattern of Early Childhood Caries (ECC)

The most common pattern of ECC is related to the eruption sequence of the primary teeth with the first teeth to erupt having the longest exposure and being the most affected. The upper primary incisors are the most affected followed by the first molars, second molars and canines. Caries severity also reflects changes in feeding habits. Teeth erupting after a change in dietary habits will reflect that change. If the eruption times are known, it may be possible to correlate the feeding history pattern with the caries pattern. This may be an important diagnostic tool helping a clinician to identify the cariogenic habit and to monitor whether the advice given is being implemented.

Prevalence

Research in the area of ECC prevalence is not as extensive as research in dental caries in older children. Some studies report caries prevalence within some specific groups within populations and they also measure prevalence within different age groups. Prevalence rates vary in preschool populations from 1–12% in developed countries to as high as 70% in developing countries and disadvantaged populations in developed countries (ethnic minorities, migrant groups and underprivileged communities) (Milnes, 1996). A Swedish study reported prevalence rates of 0.5% at age one, increasing to 8% at two and 28% at three (Wendt et al, 1994). This finding is similar to the result reported for Australian 5 year olds where 36.5% were found to suffer from caries (DSRU, AIHW 2001). Such high percentage of young children experiencing decay suggests that unhealthy dietary and tooth cleaning behaviours continue in our society. Eliminating or reducing such harmful behaviours require greater attention from all members of the dental team.

Aetiology

Early childhood caries is a lifestyle disease with biologic, behavioral, and social determinants (Twetman at al, 2000). The biological mechanisms are well presented in a review published by Seow (1998). The most frequent sources of acid in the mouth are from highly cariogenic or erosive foods. One of the main factors is the frequency and duration of exposure of the teeth to these acids. Frequent use of a bottle filled with milk, or black currant juice, fruit juice or cordial, given to the child in a bottle while going to sleep, and which remains in the mouth during the night, is considered to be one of the main cause of rapidly progressing ECC. There are many studies that suggest that children with ECC have a high frequency of sugar consumption, not only in the form of fluids given in the bottle, but also of sweetened solids (Seow, 1998). These include biscuits that are allowed to remain caked to teeth and which would result in prolonged exposure of the teeth to cariogenic acids. Even frequent and prolonged access to breast milk can result in ECC, due to the fermentation of pooled lactose to lactic acid and prolonged contact with the teeth. Another cause is the use of honey on the dummy, where again the prolonged contact results in conversion of honey carbohydrates to organic acids. There is a myth that needs to be clarified with the parents of young babies. The myth is that "natural" sugars are good for our teeth and refined sugars cause dental decay. The truth is that monosacharides such as glucose and fructose, that are present in fruit and honey, can cause a pH drop, can demineralise enamel and therefore are as cariogenic as sucrose (Koulourides et al, 1976).

Management of ECC

Where caries has become advanced, pain control is often an initial requirement. Preventive action is also urgently needed to control the cause of the ECC and to avoid further damage to the teeth. For complete restorative management general anaesthetic may be required but that usually takes some time to organise. However, if the treatment is to achieve a long-term success some steps need to be taken starting from the first visit.

Postnatal education of parents on dental care for infants

This is the right time to advise parents of the potential risks to the dentition of their newborn child. Awareness of the factors, which can lead to early childhood caries, can save much trauma for parents and children.

It is important to ensure that parents understand that regular dental check-ups are essential for early diagnosis and treatment of any dental condition. Parents also need to recognise that they are the best role models for their children's oral health behaviours such as brushing, diet and dental care.

Areas that need attention

- *Dietary counselling is the most important and urgent requirement. A detailed summary of dietary patterns including food frequency for the family, and in particular the child, will show which food or liquid source, its frequency and method of consumption is the most likely cause of the ECC. Most parents when informed of the causes of the child's dental problem are keen to consider modification of dietary habits.*
- *In many cases improvement of tooth cleaning habits is beneficial. It is important that parents clean children's teeth in the morning and after the last meal, before the child goes to bed. Toothpaste used for children between 2 and 6 years of age should contain low concentration fluoride (500ppm). Helping a child with brushing teeth should be no different to helping with regular daily personal hygiene such as washing the face and hands in the morning and before bedtime. Both, toothbrushing and personal hygiene can be done at the same time. Developing good, regular toothbrushing habits early in life ensures good fluoride protection for deciduous teeth as well as permanent teeth. In cases of teeth where there is already caries and teeth are very sensitive, the use of warm water and a soft toothbrush with fluoride toothpaste helps the child cope with cleaning sensitive teeth.*
- *Caution is recommended in the use of topical fluorides to control the caries activity with very young children.*
  When advising the use of additional fluoride a practitioner needs to remember that young children cannot spit out and most of toothpaste or other fluoride products put in the mouth is swallowed. If the total daily amount of ingested fluoride is greater than 0.05- 0.07mg/kg of body weight the child is at risk of fluorosis of permanent teeth. Toothpaste is not the only source of daily fluoride intake. Other sources, such as water, tea consumption or infant formula use need to be investigated (Practice Information Sheet no 3).
  However, if there is need for additional fluoride use at home it is important to make sure that parents use only the smallest amount possible.
  Also products such as slow release fluoride varnishes can help to reduce the risk of fluorosis and because these products are only applied professionally the amount used is well controlled.
  It is also important to make sure that no fluoride product is used when the child has an empty stomach (e.g. before breakfast) as calcium products in the stomach prevent excessive fluoride absorption and lower the fluoride blood plasma level.
  Concentrated fluoride products are generally not advisable as they are likely to increase the risks of dental fluorosis however, in some cases it might be a trade off between severe consequences of dental caries and the risk of dental fluorosis.
- *Improving oral hygiene efficiency is also of critical importance in controlling ECC. Some investigators have pointed out that the plaque control levels of the mother impact significantly on the transmission of Streptococci to the child in early years, and thus contribute to the caries risk of the child. Saliva transmission (testing the child's food for taste or temperature, popping the dummy into the adult's/your own mouth to clean it, or kissing) can spread the Streptococci bacteria. For this reason, it is important for the dental professional to include both mother and child in oral hygiene instruction programmes in caries prevention. Some clinicians report using Chlorhexidine gels as part of their caries control programme in ECC. However, most report difficulties with compliance due to the bitter taste and so far the long-term effectiveness of this product on EEC has not been confirmed.*
- *Because preventive habits usually take time to be adopted effectively, urgent restorative care of deep carious lesions may be carried out during initial appointments by atraumatic restorative technique (ART) with glass ionomer restoration. This can usually be carried out by hand instrumentation only, making it more acceptable to the young child than use of local analgesia and the drill.*

Further information

can be obtained from the

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