

Caries

CONTINUING CARIES PROBLEMS IN SPECIFIC COMMUNITY GROUPS

This Practice Information Sheet is developed to give an overview of the caries problem in Australia, high caries risk groups and associated risk factors. It will also provide some general guidelines on the caries management of patients in the high risk category.

The significant reductions in caries prevalence in Australia among children over the last two decades have led some sections of the community to believe that caries is well controlled. However, epidemiological studies eg NOHSA, 1987¹ have clearly shown that this is not the case, and that caries activity in some groups in the population is higher than might be either expected or accepted.² There are three age groups in which caries activity is of particular concern. These groups include:

- Pre-school children (0-4 years).
- Adolescents and young adults (15-30 years), and
- Older adults (65 years and older).

Recent studies have also identified the existence of some sub-groups of the population defined by medical, social and geographic criteria, who continue to experience high levels of caries activity.^{2,3,4,7} These include:

- people in some rural communities, especially drinking water with low fluoride level;
- those suffering from ill health;
- people with moderate or severe disabilities; and
- recent refugees or migrants.

HIGH CARIES RISK GROUPS

It is important to understand why caries continues to be a problem for some groups of the population. The most effective approach to caries prevention or control is only possible when analysis of factors promoting the caries process is completed. Different risk groups are characterised by different risk factors.

and risk factors

exposure of teeth to high sugar and acidic (pH of 2.8 – 4.0) drinks at night when salivary flow is diminished.

Fluorides from drinking water or toothpaste are often insufficient to counteract the cariogenic potential and the pattern of use of these drinks.

Pre-school children

The proportion of young children with caries experience is difficult to precisely determine as this age group is rarely studied. Studies have suggested that 3-5% of two year old children have 'frank' cavitation on at least two upper anterior teeth and up to 20% of pre-school children have signs of dental caries. The mean dmft of 4 year old children in Australia in 1996 was 1.44 with the decay component (d) of 1.14 teeth being the major contributor (Fig 1). In comparison at the same time the mean DMFT of 12 year olds was 0.94 with the D component of only 0.34.

The largest contributing factor is considered to have a strong behavioural component such as a frequent exposure of recently erupted teeth to fermentable sugars eg. fruit juices, flavoured milk, or syrups. These drinks are often given to a child in a bottle just before going to sleep. The increased caries risk associated with such drinks is caused by continuous and prolonged

Adolescents and young adults (15-30 years old)

While 12 year old children enjoy a low level of caries activity (Fig 2) the situation among young adults indicates that not all the gains in oral health in childhood are carried forward into adulthood. The Young Adults Study conducted in metropolitan Adelaide in 1999 showed that 15% of all those examined had a DMFT of 8 or above, 28.6% were diagnosed with active decay and just 21.1% were caries free. These results are likely to be an underestimation of the actual situation in Australia as the study was conducted in a fluoridated, metropolitan area.

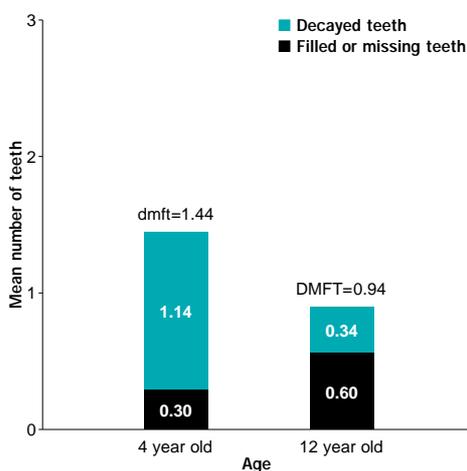
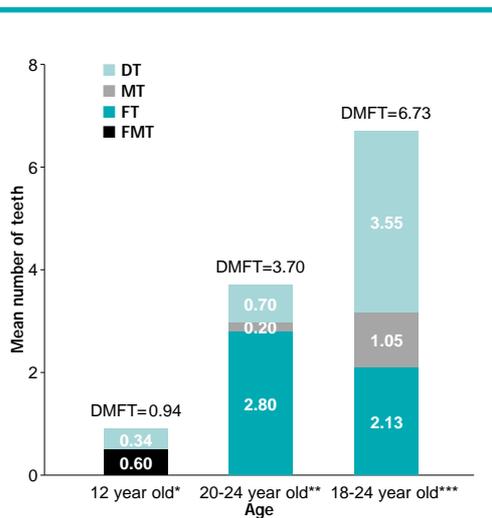


Figure 1
Caries activity in pre-school children (4 year olds) and 12 year olds in Australia².



*12 year old caries activity in Australia in 1996⁴
 **Young Adults Study in fluoridated Adelaide, 1999
 ***18-24yo in SA – 1995-1996 Public-funded dental care

Figure 2
 Caries activity in 12 year olds and young adults in Australia.

Figure 2 presents the mean DMFT for the 20-24 age group in the Young Adults Study in 1999 and patients accessing publicly funded dental care in South Australia (1995-1996). The mean DMFT in the Young Adults Study was 3.70 with the decay (D component) of 0.70. Among patients that were eligible for public dental care the DMFT was found to be much higher (DMFT=6.73) with the “D” component of 3.55.

There are several reasons behind the deterioration in oral health of some young adults. Firstly, change in psycho-social factors can often be associated with a change in diet or oral health behaviour practices. Secondly, young adults are subjected to changes occurring concurrently in various areas of their life, for example entering the workforce or moving out of home to become more independent. These changes may result in an inadequate diet, often relying on food that is convenient, easy and fast to get. Unfortunately this type of diet, often containing high amounts of ‘hidden sugar’, is far from optimal and may have a negative impact on dental health. Young people may also eat irregularly triggering the need to snack frequently or drink more fluids such as soft drinks or sports drinks. Thirdly, the exposure to fluoride is often reduced as well through the irregular use of toothpaste or drinking bottled water that is low in fluoride.

Even with the fluoride exposure remaining unchanged, the dietary shift may become too great for remineralisation factors to counterbalance the demineralisation challenges.

Many young people after leaving school do not seek dental care for a number of years making it impossible for dental professionals to further directly (on one to one basis) guide them on dental prevention issues.

Older adults

The high DMFS level (Decayed, Missing, Filled Surfaces) in this group is not surprising, as older adults now live longer and retain greater numbers of natural teeth, often with a long history of various dental treatments. This group of patients may also be disadvantaged in terms of lacking the pre-eruptive benefit of fluoride from water fluoridation during the tooth-formation period. The retained natural dentition may also suffer from periodontal disease with exposed root surfaces that can become decayed. Furthermore, an increasing prevalence of illnesses may divert the individual’s attention from oral to other health issues, and reliance on medications (some possibly high in sugar), can contribute to the increased caries risk. The decreased ability of some older adults to maintain oral hygiene also adds to the increased risk of caries. Reduced mobility and an increased dependence on others to look after them also impact on their behaviour in seeking dental care. Some dental problems may be left unattended and in consequence increase the ‘D’ component of the DMFT. An example of such problems would be a tooth with a lost restoration, which in time becomes decayed.

Another area that has recently gained the attention of clinicians, is the issue of partial dentures being a possible contributing factor to the increased risk of caries. Tooth loss experienced by older adults often results in construction of a partial denture. Some partial dentures not only interfere with saliva flow around the adjacent teeth, but they may also encourage long term plaque retention and contribute to increased caries risk. This may be of particular importance when other people become responsible for a patient’s oral care.

The psycho-social changes associated with retirement, loss of lifelong partner, changes in daily routine/schedule, or moving to retirement accommodation may also have a significant impact on oral health through changes in dietary pattern or oral health behaviour.

Patients with moderate to severe medical problems

The aetiology of increased caries risk in patients in this group is usually complex. Many patients in this category are elderly and already at a higher risk of caries. Factors such as being unable to look after their teeth effectively due to a physical disability or other medical problems can result in reduced fluoride exposure. Use of partial dentures, common in this group, is another factor that may contribute to the increased caries risk. The acid challenge may often be increased due to the dietary changes, possible high sugar content of some medications or sucking lollies to relieve symptoms of dry mouth.

The mentally or physically disabled

The increased risk of caries in this group tends to occur because of patients’ reduced ability to care for themselves. Sometimes the patient’s diet is externally controlled and may be adequate, but the patient’s oral health behaviour may be inadequate. This situation worsens when both diet and fluoride exposure become inadequate. Some patients may also be given medications containing sugar further increasing the risk of caries.

Recent refugees or migrants

Some migrants arrive in Australia with active carious lesions. This often happens when they arrive from countries experiencing wartime deprivation or where access to dental services or oral health preventive measures were inadequate. The development of new lesions in this group may also happen soon after arrival. This may be a result of various factors such as increased exposure to readily available, cheap foods and beverages, which are high in refined carbohydrates. Overall changes associated with migrating to a new country may also shift attention from oral health to other issues and result in deterioration of oral health. It is also likely that increased levels of stress may adversely affect dietary patterns or oral health behaviour.

Residents of rural areas

Caries rates vary markedly between rural and urban communities with higher levels noted in the rural areas. The difference is often attributed to a low exposure to fluoride. Many rural areas do not have access to water fluoridation or other oral health preventive measures. Financial hardship is another barrier to maintaining good oral health. Fewer teeth with restorations, high levels of untreated decay, and greater numbers of missing teeth frequently found in this group are probably a result of limited access to dental services experienced by rural communities.

Undesirable diet changes... although fluoride exposure appears adequate, dietary shifts may become too great for remineralisation factors to counterbalance the demineralisation challenges.

High caries risk patients in general practice

Understanding the factors contributing to the increased risk of caries in the high risk patient is a vital part of patient management and an important factor in achieving success.

Some patients from high caries risk groups who are caring for others, for example, recent migrants with young children or older adults looking after grandchildren etc., may inadvertently influence dietary pattern or oral habits of people in their care. If the influence is unfavourable the caries risk of those being cared for may be increased. There is also a risk of carers applying fluoride treatment that was prescribed for them to people in their care, for example, children. Therefore, it is very important for all dental services providers not only to identify patients that are at higher risk of caries, but also to ensure that patients understand that prescribed fluoride treatment applies only to them.

A clinician needs to be aware that not everyone from the high risk groups suffers the same rate of tooth decay and that risk factors characteristic for a particular group do not apply to everyone in that group. The preceding discussion on the risk factors associated with various risk groups can only guide a practitioner during the clinical examination. In order to consider variation between patients and understand risk factors, a thorough examination should include steps such as:

- an examination of fluoride exposure: eg. source of drinking water, use of toothpaste with fluoride, or use of systemic fluorides;²
- a thorough medical and social history;
- a thorough oral examination, including incipient carious lesions ('white spot lesions');
- an investigation of dietary habits: eg. the amount and frequency of snacks, soft drinks or lollies, particularly between meals;
- the reinforcement of patient's understanding of the importance of maintaining good oral health; and
- attention to recent or impending changes in patient's life and their possible implications for oral health.

Management of patients with high caries risk in general practice

Depending on the severity of the disease, its causes, the patient's age, and the ability of the patient or carers to implement the recommended treatment, the preventive management program may involve:

- a. Advice to increase the frequency of use and/or concentration of toothpaste with fluoride.
- b. Advice to 'spit and not rinse' after brushing.
- c. Daily application of topical fluoride gels (12,300ppm APF or NaF) for at least two weeks, while dietary habits and oral hygiene including use of fluoride toothpaste are being improved. After the initial use of higher concentration fluoride the next step should be to decrease the additional fluoride exposure and use 200ppm fluoride mouthwash. This product can be discontinued when all the necessary changes in oral health and dietary behaviours are well established.
- d. Where deep lesions are detected during an initial examination, temporary caries control is important using glass ionomer type of restoration. It is important to ensure that caries is controlled before permanent restorations are placed. However, aesthetic considerations may dictate that some of the anterior restorations can be placed at the beginning of the caries management program. Some patients may wish to have all permanent restorations placed as quickly as possible, therefore, it may be necessary to explain the rationale for placing temporary restorations.³
- e. Early success of the caries management program can usually be assessed after three months. Evidence of success is represented by remineralisation of early enamel lesions. If cavitated cervical lesions were present at the initial examination, the hardening of exposed dentine to tactile assessment with a blunt probe should occur.⁵ Care also needs to be taken to make sure that no new lesions have developed during that period.
- f. Monitoring appointments may need to be initially more frequent until the patient is in good control of his or her own dental health and unlikely to go back to the previous undesirable habits. When this control has been achieved the next

examination may be scheduled as for a patient at a low risk of dental caries.

- g. Careful counselling of parents or carers regarding diet and dietary habits that may be relevant for all risk groups but particularly for the youngest, functionally dependent or the oldest patients.

Special care needs to be taken when recommending any fluoride treatment for young children. To ensure success of the treatment a fluoride product should be chosen carefully and the amount to be used needs to be appropriate for the patient's age and level of cooperation. All parents need to be aware that **any fluoride products at home need to be kept out of reach of children.**

Successful management of caries in high caries risk groups should also involve:

- a. promotion of frequent and regular use of fluoridated toothpaste involving the 'spit and no rinse' method;
- b. wider use of protective sealants and frequent application of topical fluoride gels or varnishes. Application of fluoride might be carried out by dental auxiliaries, who may also provide effective dental health education;
- c. education on the benefits of good oral health and how to maintain it;
- d. dietary advice on sources and intake of sugars; and,
- e. management of Xerostomia where diagnosed (eg Sjogren Disease or post radiation), to prevent patients from relieving the dry mouth symptoms by frequent consumption of candies, lollies or sweetened drinks.

A regular and frequent use of fluoride toothpaste associated with good oral hygiene, drinking fluoridated water, and avoidance of refined carbohydrates for all patients with increased risk of decay are the important factors in maintaining healthy teeth.

SUMMARY

As dental caries is still a problem for many people in Australia, it is important to detect early carious lesions and to identify those individuals at an increased caries risk. Awareness of the existence of specific community groups with continuing caries problems often assists in identifying individuals that are at high caries risk and helps to diagnose their individual risk factors.

While only some patients are at a high caries risk, all patients with teeth are potentially at risk. It is necessary to assess the risk status for every patient.

Effective management of caries in each group requires different approaches. A thorough knowledge of the various

aetiological factors contributing to caries development, an ability to detect early signs of cariogenic activity, and a detailed knowledge of the availability and effectiveness of preventive methods are essential factors for successful caries management. An adequate number and frequency of the maintenance visits are also necessary for each patient if the management plan is to be successful.

It is now possible for the dental team to help patients with high caries risk to control the disease. Successful outcomes are extremely rewarding for all the team members of the practice.

Further information

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