



Commentary

Child Dental Caries – A Global Problem of Inequality

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Dental caries is still one of the most prevalent preventable diseases worldwide, with prevalence in some countries over 90% in 3–5 year-olds. It is a behaviourally moderated biofilm mediated disease, with dietary ‘fermentable carbohydrates’, specifically free-sugars, as the driving aetiological factor [1, 2].

Frequent dietary free-sugar consumption allows cariogenic bacteria to thrive due to a decrease in pH and increase in extracellular glycans, creating an ecological shift in the biofilm microbiome with an increase in the proportion of cariogenic microorganisms [3]. Dental caries is not a simple infectious disease, but one influenced by many factors at the individual level, such as diet and oral hygiene; and at the population level such as socio-economic position, ethnicity, oral health knowledge and attitudes and access to care [2, 4]. In addition, approximately 30% of children are born with developmental defects in their tooth enamel, increasing the dental caries experience in those at caries risk [5].

The major oral disease in children is dental caries, often related to consumption of free sugars contained in supplementary foods and behavioural traits such as nocturnal bottle feeding [2]. High caries experience during childhood is associated with increased caries risk during adulthood. Dental caries can be considered a ‘legacy disease’, as once the surface of a carious lesion (the outcome of the caries process) becomes cavitated, this creates a niche for the biofilm to develop and be protected from oral hygiene practices – in most cases operative intervention is required; the nature of which is dependent on the extent of the lesion [4]. Currently, interventions such as sealants, restorations and extractions are available, with general anaesthesia required for many children due to limited behavioural capabilities, dental fear and disability [6, 7].

Indigenous populations in many countries (i.e. Australia, Canada, USA, New Zealand, Brazil) have poorer oral health outcomes and poorer self-reported oral health. This is primarily due to the effects of many social determinants of health and limited timely access to care [8–10]. Individuals who reported a symptomatic, problem-based attendance pattern for dental care, low oral health literacy and poor oral health

behaviours reported poorer oral health [11]. Inequalities in indigenous population oral health tend to be similar across countries, with greater numbers of untreated carious lesions and more extracted teeth [8].

However, in the early stages of the disease, before cavitation, carious lesion progression can be halted, and even reversed, primarily by reducing free-sugar consumption and encouraging effective oral hygiene (especially with fluoridated toothpaste), and with interventions such as high fluoride concentration varnish possible with third party application [4, 7]. Therefore, early identification of individuals or populations at increased caries risk and targeted preventive intervention has the potential to decrease the burden of disease.

Historically, interventions in oral health have had limited success due to being based on simplistic ideologies regarding the caries process. Emphasis on eliminating specific bacteria such as *Streptococcus mutans* or the recommendation of the use of fluoride products without consideration of other behavioural factors such as diet and oral hygiene has limited preventive success [4].

The study published in this issue by Lisa Jamieson and colleagues highlights the efficacy of a multilayered approach to maintaining oral health in Aboriginal children. The engagement with the local community and provision of information and preventive services in a culturally appropriate manner maximises the potential impact of the intervention. The acknowledgement that maternal oral health is associated with child oral health, and that dental caries has a large behavioural component influenced by social determinants drives the provision of oral health information via anticipatory guidance and motivational interviewing technique in conjunction with providing appropriate dental care for the mother. In conjunction with application of highly effective, relatively low cost and safe fluoride varnish on a regular basis, this intervention provided benefits to the child participants. Although, as concluded by the authors, the benefits gained may not be as large outside the constraints of a research project.

Increase in oral health knowledge of care-givers via interventions such as motivational interviewing and anticipatory guidance has the potential to improve child oral health via behavioural change [12, 13]. However, specific training is required, and in addition, especially for indigenous populations, education regarding cultural competency and engagement with communities will be required, requiring a change in the current curriculum of many dental schools [14].

Child oral health, predominately dental caries, is still a worldwide health problem, especially in indigenous communities. Early identification of individuals (especially children) at risk allows the opportunity of reducing the disease burden via behavioural change with respect to diet and oral hygiene behaviours, and other interventions such as high

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concentration fluoride varnish application, and this can provide life-long benefits in oral health. Interventions must be culturally appropriate and involve the community in design and implementation [15]. Further interventions may be necessary to maintain healthy behaviours. In the context of limited health expenditure, targeting individuals at higher risk can increase cost-effectiveness.

The importance of child oral health should not be underestimated.

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