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Sugars and dental caries

KEY FACTS

- Dental caries[1] (also known as tooth decay or dental cavities) is the most common noncommunicable disease worldwide.
- Dental caries is an expensive disease to treat, consuming 5–10% of health-care budgets in industrialized countries, and is among the main reasons for hospitalization of children in some high-income countries.
- Free sugars[2] are the essential dietary factor in the development of dental caries because dental caries does not occur in the absence of dietary sugars. Dental caries develops when bacteria in the mouth metabolize sugars to produce acid that demineralizes the hard tissues of the teeth (enamel and dentine).
- People who have more dental caries have a higher intake of free sugars.
- In many countries, sugars-sweetened beverages, including fruit-based and milk-based sweetened drinks and 100% fruit juices, are a primary source of free sugars.
- Confectionery, cakes, biscuits, sweetened cereals, sweet desserts, sucrose, honey, syrups and preserves are common sources of free sugars.
- Unlike whole fresh fruits, fruit juices contain free sugars and also contain more calories. Importantly, chewing whole fresh fruit stimulates salivary flow that protects against demineralization of tooth substance.
- Limiting free sugars intake to less than 10% of total energy intake – and ideally even further, to less than 5% – minimizes the risk of dental caries throughout the lifecourse.
- Severe dental caries often causes pain and infection, which may result in tooth extraction.
- Severe dental caries also affects general health and well-being.
- Severe dental caries is a frequent cause of absenteeism at school or work. An association between dental caries and undernutrition in children has been reported in some low- and middle-income countries; however, whether this is cause or effect, or both, remains to be determined.

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[1] The severity of dental caries may be measured by using indices such as the DMFT/dmft index (where upper case denotes permanent dentition and lower case primary dentition), which records the number of decayed (D), missing (M) and filled (F) teeth.

[2] Free sugars include all monosaccharides and disaccharides added to foods and drinks by the manufacturer, cook or consumer, and sugars naturally present in *honey, syrups, fruit juices and fruit juice concentrates* (WHO Guideline on sugars intake for adults and children: http://www.who.int/nutrition/publications/guidelines/sugars_intake/en/).

INTRODUCTION

Dental caries is a major public health problem globally and is the most widespread noncommunicable disease (NCD). It is also the most prevalent condition included in the 2015 Global Burden of Disease Study, ranking first for decay of permanent teeth (2.3 billion people) and 12th for deciduous teeth (560 million children).

Dental caries can be prevented by avoiding dietary free sugars. Moreover, dental caries is largely preventable through simple and cost-effective population-wide and individual interventions, whereas treatment is costly, and is often unavailable in low- and middle-income countries.

In low-income countries, the majority of dental caries goes untreated. Teeth affected by caries are often extracted (pulled out) when they cause pain or discomfort.

Severe dental caries can impair quality of life. For example, dental caries may cause difficulties in eating and sleeping, and in its advanced stages (abscesses), it may result in pain and chronic systemic infection. Dental caries is also associated with adverse growth patterns. Further, tooth decay is a frequent cause of absence from school or work.

SCOPE OF THE PROBLEM

Almost half of the world's population is affected by dental caries, making it the most prevalent of all health conditions. High levels of dental caries occur in middle-income countries, where sugars consumption is high. In such countries, health systems are challenged to provide preventive population-wide strategies and primary oral health care often is not available.

WHO IS AT RISK?

Everyone is at risk of dental caries, but children and adolescents are most at risk. The majority of dental caries occurs in adults because the disease is cumulative. There is a clear dose–response relationship between sugars consumption and dental caries. The disease is also associated with socioeconomic status, with high prevalence rates among the poor and disadvantaged population groups.

SIGNS AND SYMPTOMS

Dental caries develops over time; loss of tooth substance (enamel and dentine) is caused by acid production resulting from bacterial metabolism of sugars. Early stages are often without symptoms, but advanced stages of dental caries may lead to pain, infections and abscesses, or even sepsis.

PREVENTION AND CONTROL

Population-wide strategies to reduce free sugars consumption are the key public health approach that should be a high and urgent priority. Because dental caries is the result of lifelong exposure to a dietary risk factor (i.e. free sugars), even a small reduction in the risk of dental caries in childhood is of significance in later life; therefore, to minimize lifelong risk of dental caries, free sugars intake should be as low as possible.

It is important that population-wide prevention interventions are universally available and accessible. Such interventions include the use of fluoride, and comprehensive patient-centred essential oral health care.

CHALLENGES

Globally, dental caries poses many challenges. The disease burden is unequally distributed – it disproportionally affects poor and disadvantaged populations, which have lower access to prevention and care. Often, dental caries does not receive adequate priority in health planning due to an underestimation of the true burden and impact of the disease. The focus of interventions is generally characterized by an isolated disease approach and a focus on costly clinical treatment, rather than

on integrated cost-effective public health strategies that address entire populations and focus on common risk factors for NCDs.

Economic growth is often associated with nutrition transition to a diet that is characterized by a high proportion of energy from free sugars and fats. In particular, such transition is associated with increased access to sugars-sweetened beverages and other dietary sources of free sugars. Increased availability of sugars in the absence of adequate oral health preventive measures is associated with marked increase in the burden of oral disease.

GLOBAL IMPACT

As the most common NCD, dental caries affects huge numbers of people across all age and socioeconomic groups, affecting their health and well-being, social interactions and economic status. The direct financial costs alone are considerable. It has been estimated that, globally in 2010, US$ 298 billion was spent on direct costs associated with dental caries. In addition, indirect costs came to US$ 144 billion, with the total financial cost reaching US$ 442 billion in 2010.

WHO RESPONSE

Public health solutions for prevention of dental caries and other oral diseases are most effective when integrated with the prevention and control of other NCDs, based on the principles of addressing common risks and the wider shared determinants of health.

Implementing policy measures to promote the reduction of free sugars intake is an effective way of addressing the burden and impact of dental caries globally. Policy measures include:

- taxation of sugars-sweetened beverages as well as foods with a high free sugars content – this is important in discouraging the consumption of these foods and beverages, which are contributing to increased free sugars intake, in particular in children and adolescents;
- implementing clear nutrition labelling, including the information on sugars contained in a product;
- regulating all forms of marketing and advertising of food and beverages high in free sugars to children through the use of a nutrient profile model that helps to identify products high in free sugars;
- improving the food environment in public institutions, particularly schools, through regulating promotion and sales of foods and beverages high in free sugars;
- removing all sugars-sweetened beverages for sale and service from hospitals, schools (including kindergartens and preschools), universities, public buildings and public workplaces; and
- making it a priority to increase awareness and access to clean water as a drink that is ‘safe for teeth’.

Implementation of public health strategies to promote appropriate exposure to and use of fluoride should also be encouraged. Although exposure to fluoride reduces the development of dental caries and delays the onset of the cavitation process, it does not completely prevent dental caries if implemented as a sole (i.e. an isolated) action. Addressing the cause (i.e. free sugars) is therefore essential in preventing and reducing dental caries.

RELATED LINKS

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