

Summary of: Are sugar-free confections really beneficial for dental health?

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FULL PAPER DETAILS

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Background Various sugar substitutes have been introduced and are widely used in confections and beverages to avoid tooth decay from sugar and other fermentable carbohydrates. One group of sugar substitutes are sugar alcohols or polyols. They have been specifically used in foods for diabetic patients because polyols are not readily absorbed in the intestine and blood stream, preventing post-prandial elevation of glucose level. Additionally they may lower caloric intake. **Methods** We searched PubMed, Cochrane Controlled Trials Registry, Cochrane Oral Health Review, Centre for Reviews and Dissemination in the UK, National Library for Public Health and a Centre for Evidence Based Dentistry website up to the end of October 2010, using the search terms 'sugar alcohol' or 'sugar-free' or 'polyols' and combined with a search with terms 'dental caries' or 'dental erosion'. **Results** Xylitol, a polyol, has been approved by the US Food and Drug Administration for its non-cariogenic properties that actually reduce the risk of dental decay and recently, the European Union also officially approved a health claim about xylitol as a 'tooth friendly' component in chewing gums. Although the presence of acidic flavourings and preservatives in sugar-free products has received less attention, these additives may have adverse dental health effects, such as dental erosion. Furthermore, the term sugar-free may generate false security because people may automatically believe that sugar-free products are safe on teeth. **Conclusion** We concluded that polyol-based sugar-free products may decrease dental caries incidence but they may bring another dental health risk, dental erosion, if they contain acidic flavouring. There is a need for properly conducted clinical studies in this area.

EDITOR'S SUMMARY

There is a children's play somewhere buried deep in my memory in which the recurring line is 'the Emperor always means what he says, but doesn't always say what he means'. The same might be applied to 'claims' made for products, especially health-related claims. That is, the claim might well mean what it says and be suitably backed-up by research evidence but does it fully say what it means, or alternatively, what it is not saying?

Sugar-free may seem to indicate that a sweet, or other product, is tooth friendly but this is not automatically the case. As disclosed in this paper, the level of acidity is also crucial in determining whether the confection may induce enamel loss leading to erosion, for example. Similarly, sugar-free might be perceived as mean-

ing reduced calories thereby lulling people on restricted calorie diets into a sense of false security. The result is a minefield of confusion for the patient who is trying his or her very best to comply with healthy choices and a complex labyrinth of communication for the professional in attempting to convey practical advice.

As with a recent research paper on the constituents of chewing gum, it seems that fruit flavouring has a lot to answer for, bringing with it a potential for increased acidity and consequent harmful lowering of pH in the oral cavity. In terms of oral health education messages the answer would seem to be to provide the patient with as much background as possible to allow them to make informed choices while attempting not to confuse or overburden them

with apparently conflicting advice. This is not an easy task and to some extent the likelihood is more that practitioners will begin to notice, perhaps erosion, in a patient and then use their own knowledge of the process to forensically track down the cause by careful questioning of that patient and their habits. While somewhat a case of shutting the stable door after the horse has bolted, it does provide a semi-preventive solution to an as yet unsolved problem, the analysis of claims; and that is what I mean to say.

The full paper can be accessed from the *BDJ* website (www.bdj.co.uk), under 'Research' in the table of contents for Volume 211 issue 7.

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IN BRIEF

- Sugar-free does not mean calorie-free. Some sugar-free products generate nearly 50% of calories produced by table sugar.
- In general, sugar-free products may help prevent dental caries. However, if they contain acidic additives, it may increase the probability of demineralising enamel, thus causing dental erosion.
- Avoiding acid-containing, usually fruit-flavoured sugar-free products may be beneficial.

COMMENTARY

Substitution of sucrose in candy with sugar alcohol polyols appears beneficial for dental caries prevention. Many people believe that sugar-free also means ingestion of fewer calories.¹ Restriction of calorie intake has a major role in the treatment of obesity. For people with weight problems, a statement that a candy is sugar-free might generate a false healthy image, as the polyols in the candy still generate 50–65% of calories from the same amount of sucrose.

A sugar-free claim also does not necessarily mean that the product is tooth friendly. Many types of sugar-free candy contain organic acids such as citric acid and malic acid to develop a fresh sour taste. During consumption the acids will dissolve in saliva, decreasing the intra-oral pH from normal values of 6.7–7.4 to values well below 5.5, the pH-value generally adopted as the critical value below which hydroxyapatite dissolves. This risk seems especially present in solid hard candies such as lollipops and the so-called jawbreakers. These types of candy slowly melt in the mouth and consumption often takes more than 15 minutes. Some children even play a game to keep a jawbreaker in their mouth as long as possible.² Consequently, the intra-oral pH may decrease for a long time to values between 4 and 4.5, a considerable risk for the development of dental erosion.

Finally, exposure to low pH values may cause local irritation of the oral mucosa. This risk seems most prominent

for candy sprays, which have very low pH values (1.9 to 2.3) and are applied directly on the oral mucosa.³

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AUTHOR QUESTIONS AND ANSWERS**1. Why did you undertake this research?**

Several patients reported tooth sensitivity after eating sugar-free hard candies. We found that they consumed fruit-flavoured candies, presumably with acidic additives. So, we embarked on this literature review.

2. What would you like to do next in this area to follow on from this work?

We believe non-acidic sugar-free candies are currently available in the market. We plan to measure pH of sugar-free candies with and without acidic additives, and hope to be able to recommend safer choices of sugar-free candies for the public.