Sugarfree Chewing Gums
and Caries Prevention

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When I talk to other dental professionals about the best measures to prevent dental decay, most will quickly identify fluoride products, sealants, nutritional counseling, and oral hygiene as traditional, proven ways to prevent caries. Unfortunately, many dental professionals are unaware of the intriguing research that has been published within the last 10 years documenting the effectiveness of sugarfree chewing gum in reducing dental decay in both laboratory and clinical studies.

Chewing sugarfree gum is a practical recommendation for caries prevention because the products are familiar and readily available for easy compliance by both children and adults. Because dental hygienists play such a critical role in recommending agents for caries prevention, they should recommend sugarfree chewing gum for patients who are at risk for dental decay. This is especially true for those patients with a history of high caries rate or dry mouth.

Salivary Production

Chewing sugarfree gum has been shown to be beneficial for a number of reasons. When patients chew sugarfree gum, salivary production is stimulated and an additional volume of saliva is produced. The higher salivary flow rate provides faster oral clearance of any fermentable carbohydrates and removes food particles between teeth. Edgar describes the "pumping" effect the saliva glands pumping saliva of increased salivary flow as critical to reach the proximal areas that are most at risk for dental decay. Many patients report that they chew sugarfree gum for fresh breath and to remove food particles from the mouth and between teeth. It is primarily through the increased volume and flow of saliva that patients will experience these benefits, so they should be encouraged to continue chewing and swallowing to maintain and prolong increased salivary flow.

Patients who have dry mouth also will benefit from the salivary stimulation that chewing sugarfree gum provides. As long as the patient can tolerate the flavoring and consistency of the gum to avoid irritating dry tissues, recommend sugarless gum to patients with dry mouth.

Demineralization and Remineralization

Research has documented the role that chewing sugarfree gum plays in both reducing demineralization and increasing enamel remineralization. Caries demineralization develops in an acidic environment when the pH of saliva drops to below 5.5 to 5.7 after food ingestion, especially fermentable carbohydrates.

When patients chew sugarfree gum, the increased volume and flow of saliva helps to dilute and clear plaque acids that can initiate the demineralization process. In addition, an increase in the salivary flow rate buffers and raises both the salivary and plaque pH, reducing the potential time that demineralization of teeth can occur in an acidic environment. An increased volume of saliva also provides more calcium, phosphate, and fluoride minerals to help remineralize tooth enamel.

Clinical research studies by Jensen and Park and colleagues have documented the role of sugarfree gum in neutralizing plaque acids after eating. In patients who were wearing partial dentures implanted with electrodes, Jensen measured the buffering capacity of a 10-minute to 20-minute session of chewing sugarfree gum containing sorbitol in raising the interproximal plaque pH after subjects ingested chocolate bars, raisins, cream-filled cookies, cupcakes, and cherry pie. Using a similar dental appliance with electrodes, Park and colleagues documented a sharp rise in proximal plaque pH after a 15-minute session of chewing sugarfree gum with sorbitol after patients ate commercially available fast-food meals, including pancakes and syrup, fried chicken, gravy and mashed potatoes, and sugared soda. Both of these studies, sponsored in part by the Wm. Wrigley Jr. Company (Chicago, Ill., www.wrigley.com), provide concrete evidence that chewing sugarfree gum with sorbitol neutralizes organic acids that are produced by bacteria in dental plaque both during the time the gum is chewed and also up to 30 minutes after the gum-chewing session was ended.

Recent controlled clinical research trials have documented the benefits of chewing sugarfree gum that contains xylitol, sorbitol, or both for caries reduction in populations at both moderate-risk and high-risk for dental caries. In a 2-year study, Makinen and colleagues documented that children who chewed sorbitol gum pellets and those who chewed xylitol gum pellets had significantly fewer carious lesions as compared with the control group, who did not chew gum.

An earlier study by Beiswanger and colleagues with sorbitol-containing sugarfree gum showed that the high-risk children (children with a high prevalence of caries, low levels of professional care, and drinking water with negligible amounts of fluoride) developed 11% fewer decayed, missing, or filled surfaces and that all children developed 7.9% fewer decayed, missing, or filled surfaces after 3 years, compared with the control group, who did not chew gum.

An additional clinical study, by Szoek and colleagues, has shown that chewing sugarfree gum reduces decay up to 40% when chewed for at least 20 minutes 3 times a day.

Taken together, these clinical studies demonstrate a clear benefit with significant caries reduction when sugarfree gum with either sorbitol or xylitol is used, compared with patients who do not chew gum.

Recommending Sugarfree Gum

These intriguing research results challenge hygienists to expand their caries prevention recommendations to include chewing sugarfree gum after eating. Chewing sugarfree gum increases salivary flow and volume and raises the proximal plaque and salivary pH to serve a critical function in caries reduction. Clinicians should stress to patients the additional positive benefits beyond caries prevention, including fresh breath, improved esthetics, and increased comfort, especially for those patients who have dry mouth. Sugarfree chewing gums are readily available for purchase at most food and drug stores.

Clearly explain the protocol for patients and emphasize the need to chew after each meal and snack for at least 20 minutes to ensure an effective outcome. Patients tend to comply readily with these suggestions because of the ease in adding sugarfree gum-chewing to their routine, and the easy availability and acceptability of the products.

Because of the easy compliance and the research base regarding caries prevention and sugarfree chewing gums, dental hygienists should feel confident and empowered regarding their recommendation of sugarfree chewing gums for caries prevention.

Disclaimer

The author has no commercial interest in or affiliation with any manufacturers of sugarless chewing gum products.

References


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