Focus: Oral Implications of Dietary Choices

Dental Hygiene Focus: Oral Implications of Dietary Choices

Dietary Choices and Oral Implications
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Yes, dietary choices really do affect our oral health. I had a young client who was eighteen years old come into my clinic one day. I was shocked when I started assessing his oral cavity, because he had generalized enamel erosion. Numerous suspicious lesions appeared on every tooth with more than one surface affected. How does this happen? After a lot of open-ended questions, the young man told me that his drink of choice was Pepsi. Not one a day, but all day long. He drank water very rarely and milk not at all. It's not as simple as saying the client consumes too much sugar or too many sweets or drinks too many Pepsi. It's more complicated than that. After speaking with the parent, it became clear that income and education were contributing factors in the client's circumstance.

How does an acid attack happen? Plaque biofilm forms a barrier on enamel and may interfere with demineralization. However, acids produced in plaque biofilm have harmful properties that offset the benefit of its barrier effect.[1, p366] When fermentable carbohydrates are eaten, bacteria begin metabolizing the sugar from the carbohydrate and produce an acid. Demineralizing acid can also come from extrinsic sources, such as acidic beverages or acidic food. The acid then attacks the tooth structures. Timing and frequency of fermentable carbohydrates being eaten play a key factor in the acid attacks. Let's look at this a little more closely. Landmark research conducted by Stephan and Miller in 1943[2] demonstrated that oral pH begins to drop within three minutes of rinsing with sucrose and remains low for up to 40 minutes. Acid is continually produced until the carbohydrate is cleared from the mouth. The longer the carbohydrate stays in the mouth, the more acid produced, and the lower oral pH drops.[3, p207]

The type of sugar that's eaten also plays a significant role. When looking at a liquid sugar it may take 20 minutes for the oral pH to return to normal. When eating a piece of cake, it may take 30 minutes to clear the mouth, and when eating something sticky such as licorice or gummy bears then it could take up to 40 minutes to clear the mouth. When the pH drops too low, it reaches the critical pH of 5.5, and this is where demineralization of the enamel starts. It is best to keep the oral cavity as close to normal as possible. Normal is considered 6.8 pH to 7.0 pH.

How can we do this? The client's saliva is key. Saliva helps to flush foods out of the mouth after eating and contains enzymes to start the digestion process. Saliva also contains calcium, phosphorus, and fluoride which help to remineralize the enamel in between eating. Eating a crunchy food with each meal will help stimulate saliva. Another suggestion is to eat a protein or fat with the meal or snack, which can prevent bacteria from producing acid. This is called a buffer food. Examples are eating peanut butter with apple wedges or having a piece of cheese after a glass of wine. Eating more cariostatic food is also recommended. Cariostatic means food that does not contribute to the caries process. Examples of cariostatic foods are almonds, meats,

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➤ Use a topical and systemic fluoride.

➤ Apply sealants to increase tooth resistance.

➤ Recommend the use of products that stimulate saliva flow, such as xylitol mints or xylitol gum, to clients who have xerostomia.

➤ Recommend that clients carry a water bottle with them during the day.

We as dental hygienists must recognize the importance of explaining the relationship between food and disease in the oral cavity to our clients. We should educate our clients on ways to lessen the impact of sugar in the diet, review factors that can decrease acid production in the mouth, and suggest how to raise the oral pH instead. Making people aware of their dietary habits can have a huge impact on their oral health.•

References
1. Stegeman CA, Davis JR. The dental hygienist's guide to nutritional care, 4th ed. St. Louis: MO: Elsevier Saunders; 2015.
2. Stephan RM, Miller BF. A quantitative method for evaluating physical and chemical agents which modify production of acids in bacterial plaques on human teeth. J Dent Res. 1943;22:45–51.
3. Sroda R, Reinhard T. Nutrition for dental health, 3rd ed. Philadelphia: Wolters Kluwer; 2018.

fresh fruit, and vegetables. Swishing with water right after eating can also help to neutralize the mouth. The use of a sugar substitute such as Stevia—a nonnutritive sweetener— is recommended. These sweeteners are not metabolized by microorganisms and do not promote dental caries.[1, p368] Toothbrushing is also an option, although it is suggested to wait at least 30 minutes after eating before doing so. (Brushing may remove a demineralized tooth structure before it has a chance to remineralize.)

Now let's look at what dental hygienists can provide to the client chairside in the clinic:

➤ Educate clients about the caries process and how to prevent demineralization of enamel. A nutritional analysis could be completed if the client's assessments show that they are eating and drinking cariogenic foods on a regular basis. Many resources are available to help your clients understand the relationship between sugar and oral health. The YouTube video "Tooth Decay – How to Avoid it" available at www.youtube.com/watch?v=Z3rheJVWNt4 is a good resource to show your clients.

➤ Recommend that the client fill out a 5-day food log and social history form. Along with the food log and social history, the dental hygienist would also use the information from the medical history and dental history to prepare a nutritional analysis based on the client's completed report.

➤ Provide a referral to one of our professional colleagues (nutritionist, dietitian). A referral may be required if the dental hygienist's assessment shows that there is a need for more detailed nutritional education than we can provide.