worthwhile to identify patients with or at risk for disease. The screening tests identified as candidates for chairside use were those for hypertension, DM, HIV infection, and CVD. Most PCPs would be willing to discuss the results with the dentist and receive a medical referral from the dentist, with few expressing a negative reaction because the referral came from a nonphysician. Factors PCPs have identified as important in the process include patient willingness to be tested, level of training of the dentist and their own capacity to accept referrals, duplication of provider reimbursement, and duplication of roles.

RELEVANT CONSIDERATIONS

Efficacy and Yield

Studies on screening in a dental setting indicate that dentists are more likely to consider incorporating these tests for medical conditions supported by evidence to be in a relationship with oral health. When patients were screened in an inner city university-based clinic, the tests indicated which patients were at increased risk for a severe CHD event in 10 years and which patients had major risk factors of interest. In addition, screening for hemoglobin A1c level identified those who were at increased risk for DM. A study has also measured the efficacy of using dental features along with hemoglobin A1c level when screening for DM. The combination was able to greatly increase the sensitivity of the test. Tests of the yield of medical diagnosis among individuals who screen positive have also supported the use of chairside screening.

Dental Links to Systemic Disease

Interest has been expressed in establishing an association between oral infections and overall health. Several studies have tried to use an association between periodontal disease (PD) and CVD. Numerous steps will be necessary before screening results linking PD disease status and medical conditions such as DM and CVD can be clearly shown to offer important diagnostic information.

DISCUSSION

Data suggest that both providers and patients have a positive attitude toward having dentists and dental hygienists perform medical screening tests chairside. Efficacy studies support the effectiveness of these chairside screening efforts to identify patients who are at a higher risk for disease or who have disease risk factors and could benefit from medical interventions or surveillance. The ability to perform the necessary procedures for screening has been shown to be present in both dentists and dental hygienists. This chairside screening initiative offers another way that dentists can contribute to the overall health of their patients.

Clinical Significance

Challenges remain in the area of reimbursement for the time and resources used in screening patients for medical conditions and in the need to expand the dental practice acts for dentists and dental hygienists so they can perform these tasks. Oral health care professionals will need additional training in both performing and interpreting the findings of these tests so that accurate information can be shared with the patient and physician. The dental school curriculum will require adaptations to address this new area where dentists provide services. These challenges remain to be figured out, but it appears that the benefits of early detection and of close monitoring of patients with chronic life-threatening diseases would win out over the barriers to implementing this exciting expansion of oral health care practice.

Greenberg BL, Glick M: Providing health screenings in a dental setting to enhance overall health outcomes. *Dent Clin N Am* 62:269-278, 2018

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ORAL HYGIENE

Interdental cleaning

BACKGROUND

Periodontal disease and dental caries share predisposing conditions, specifically, a susceptible host, supportive environmental factors, and the presence of a predisposing oral biota. Microorganisms in the oral biofilm play a vital role in both disorders, so oral hygiene instructions offered to prevent these diseases include the removal of the biofilm by tooth brushing and the performance of interdental cleansing, such as flossing. Direct evidence supporting connections in adults between flossing and having fewer carious teeth and less periodontal disease remains weak, mostly due to small sample sizes or the study design. Flossing added to tooth brushing is known to reduce gingivitis in adults

and to reduce interproximal caries risk in children. The prevalence of oral disease and missing teeth among persons who perform interdental cleaning was compared to the prevalence among those who don't perform interdental cleaning.

METHODS

To obtain a representative cross-sectional sample of US adults, the data were gathered from the National Health and Nutrition Examination Survey (NHANES) 2011 to 2012 and 2013 to 2014 and included 6891 adults age 30 years or older. The specific parameters measured were interproximal clinical attachment level (iCAL) of 3 mm or greater, interproximal probing depth (iPD) of 4 mm or greater, number of coronal and interproximal caries, number of teeth missing, 1 or more surfaces with coronal caries, and periodontal profile class (PPC). Users of interdental cleaning tools were compared to nonusers for each parameter. The users were divided by frequency of use into those who completed interdental cleaning 1 to 3 times/week and those who did so 4 to 7 times/week.

RESULTS

Sixty-nine percent of the individuals used some type of interdental cleaning. Users were more likely than nonusers to be women, have achieved a higher educational level, be never smokers, and make regular dental visits. In addition, they were also more likely to be Caucasians, less likely to be African Americans, and more often not diabetic than nonusers.

Among the nonusers, there were significantly higher percentages of sites with iCALs of 3 mm or more and iPDs of 4 mm or greater compared to the users. Persons who used interdental cleaning 4 to 7 times/week had a significantly lower percentage of sites with iCALs of 3 mm or greater than those who limited their interdental cleaning to 1 to 3 times/week. The more frequent interdental cleansers also tended to have fewer sites with high iPDs than those who limited themselves to cleaning 1 to 3 times/week.

Data on caries and tooth loss were adjusted for the amount of sugar consumed. Interdental cleaner users had significantly fewer coronal caries and interproximal caries than nonusers. There were no significant differences in caries between the 2 divisions of interdental cleaner users. Nonusers had significantly more teeth missing than interdental cleaning users regardless of frequency of cleaning.

When dental caries was considered, nonusers had 1.73 times higher odds of having 1 or more surfaces with coronal caries compared to users, with no difference between the 2 groups of

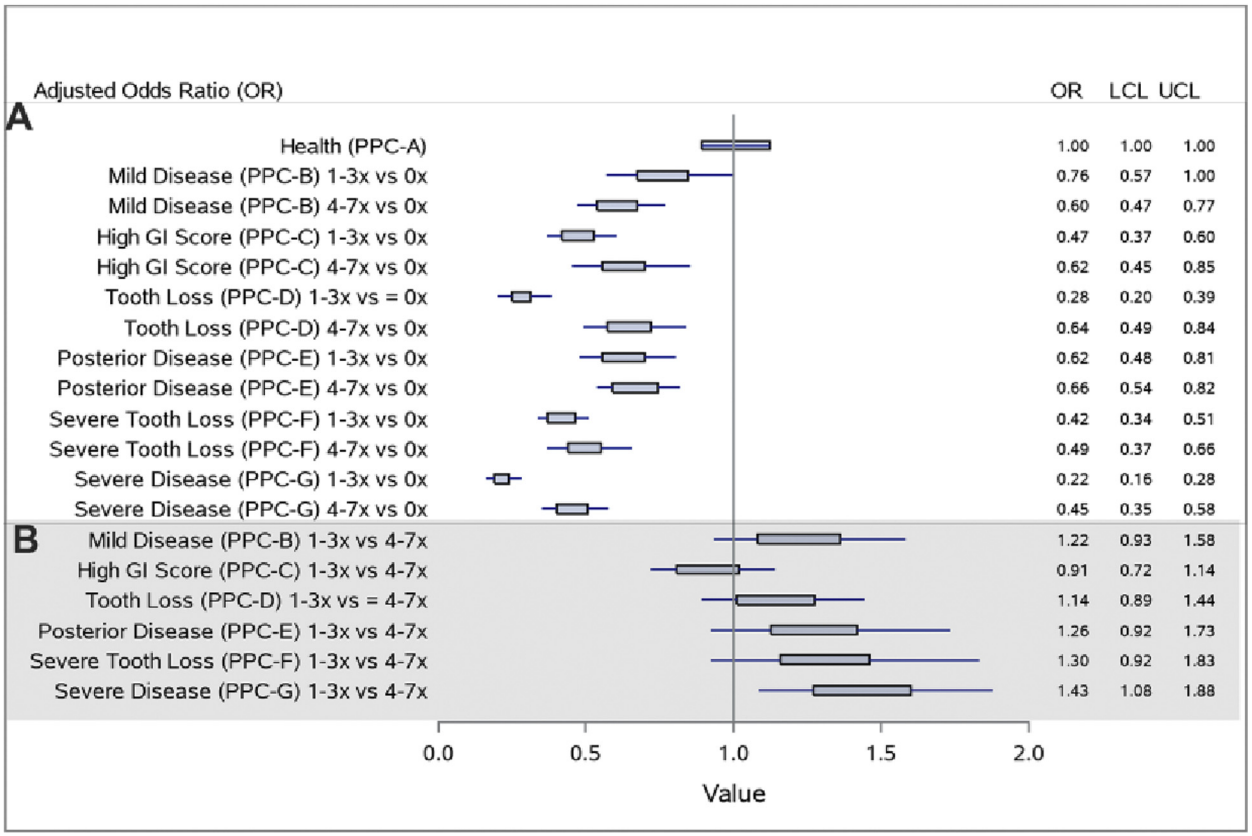

Figure 3. Odds ratios (95% confidence interval) of prevalent oral disease defined by the periodontal profile class relative to health (PPC-A) comparing, **A,** interdental cleaning users with nonusers and, **B**, individuals according to interdental cleaning frequency (1 to 3×/wk and 4 to 7×/wk vs nonusers). *GI,* Gingival inflammation. (Courtesy of Marchesan JT, Morelli T, Moss K, et al: Interdental cleaning is associated with decreased oral disease prevalence. *J Dent Res* 97:773-778, 2018.)

users. When periodontal conditions were considered, most users were healthy. They had significantly lower odds of being in a disease category relative to health regardless of cleaning frequency, except for mild disease and flossing 1 to 3 times/week, although this showed a similar trend. Less frequent interdental cleaning was associated with significantly higher odds of having severe disease compared to more frequent cleaning. Overall, individuals who used interdental cleaning devices had a lower percentage of interproximal clinical parameters related to periodontal disease, fewer carious teeth, and fewer missing teeth than nonusers (Figure 3).

DISCUSSION

Interdental cleaning was significantly associated with lower levels of periodontal disease, fewer carious teeth, and fewer missing teeth than not performing interdental cleaning. Persons who cleaned the interdental areas less frequently had a higher risk for severe periodontal disease than those who cleaned more frequently. Thus the evidence that interdental cleaning is associated with reduced levels of oral disease is supported.

Clinical Significance

Interdental cleaning has a positive preventive effect against periodontal disease and dental caries. Performing it more often, specifically, 4 to 7 times/week, tends to lower the chance of having interproximal periodontal disease compared to less frequent or no cleaning of this important area. Interdental cleaning constitutes an important component of oral hygiene with respect to its ability to promote oral health and avoid oral disease.

Marchesan JT, Morelli T, Moss K, et al: Interdental cleaning is associated with decreased oral disease prevalence. *J Dent Res* 97:773-778, 2018

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ORAL/SYSTEMIC CONUNDRUM

Justifying oral health care

BACKGROUND

Much ink has been used to print studies suggesting an association between oral health and systemic diseases such as cardiovascular disease and hypertension. However, although dentistry has a vital role in public health and in the lives of our patients, going beyond that to claim that oral health derives its value from its effects on systemic disorders may be misleading.

CURRENT LITERATURE

Over the past 25 years or so, researchers have reported associations between oral diseases and conditions such as preterm birth, diabetes, cardiovascular disease, stroke, and cancer. The message being conveyed is that having good oral health will modify, reduce, or prevent some systemic diseases. The media has taken this message and used it to grab headlines and dental professionals and organizations have used it to recruit new patients and to justify insurance coverage for oral health care, but is it true?

The current literature lacks convincing, high-quality evidence that oral health care actually exerts a measurable effect on specific diseases. Without the support of this high-quality scientific evidence, making such claims can damage the credibility of the dental profession.

In actuality, the research into possible associations between oral and systemic disease has yielded a variety of results. Factors that produce this variation include heterogeneous participant populations, different study designs, and bias in selecting facts that make a case for or against the role oral disease may have on a systemic condition. Meta-analysis can be useful

Clinical Significance

Dentistry is more closely aligned with medicine than at any other time in modern history. Preventive dental care for people who suffer chronic systemic diseases will improve their oral health and lower the cost of their dental treatment. Research should continue into possible associations between oral and systemic health and disease and into the costs and benefits of preventing and treating oral disease. It would be good to establish the effectiveness of screening for systemic disease in dental settings and to evaluate the outcomes of dental care for patients who are receiving treatment for cancer, organ transplantation, joint replacement, and invasive cardiac procedures, for example. But for most patients, good oral health alone is sufficient justification to participate in effective preventive care and treatment for oral disease.