

The interactions between physicians and dentists in managing the care of patients with diabetes mellitus

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Guest Editor

The effect of diabetes mellitus (DM) on a person's health can be profound. A diagnosis of DM carries with it the knowledge that the patient will be at high risk of developing cardiovascular diseases, kidney disease, eye disease, nerve disorders, alterations in wound-healing capacity and numerous other maladies.¹ When we consider that more than 23 million Americans have DM, the effects of the disorder can develop into a major national public health problem.² Since almost 8 percent of the U.S. population has DM, dental practitioners should be familiar with this disorder, including its diagnosis, pathophysiology, potential complications, methods of medical management and oral implications.

In this supplement, Kidambi and Patel³ provide a comprehensive overview of DM from the medical perspective. Depending on the demographic profile of a dental practice patient population, the prevalence of DM could be much higher. For example, in a dental practice in which many patients are Native American, African-American or Latino, the prevalence generally will be higher than the national prevalence of 8 percent.² A dentist in such a practice could treat multiple patients with DM each day, which makes it critical that he or she have a thorough knowledge of the disorder.

More than 50 years of research has focused on the oral implications of DM. Although it is difficult to distill this large volume of research into a single article, Lamster and colleagues⁴ provide an excellent review in this supplement. In their review, they also discuss research results that demonstrate that oral infections and inflammatory periodontal diseases may have adverse effects on the metabolic state in patients with DM. Inflammation increases

insulin resistance, which can result in altered glycemia. Patients with DM who have extensive periodontal inflammation may have increased insulin resistance or poor glucose control, and resolution of the inflammation after periodontal therapy is associated with improved glycemic control in many patients.⁵ The oral cavity may exhibit the first signs or symptoms of an undiagnosed or poorly controlled diabetic condition, so dentists and dental hygienists must be aware of these signs and symptoms and know what to do if they are present.

Poor glycemic control in patients with DM or persistently elevated blood glucose levels in a patient with undiagnosed DM is associated with a marked increase in the risk of developing diabetic complications such as retinopathy, nephropathy, neuropathy and macrovascular conditions such as myocardial infarction and stroke.^{6,7} Conversely, improved glycemic control is associated with a decreased risk of developing these conditions. Physicians, nurses and diabetes educators are charged with educating patients with DM about proper diet, exercise and use of medications to improve glycemic control, with the goal of reducing long-term complications.⁸ Oral health practitioners are an important part of this health care team, but they often are reluctant to step into the role of an adjunct diabetes educator. But who other than dentists and dental hygienists is equipped to educate patients about the importance of good oral health, and who other than dentists and dental hygienists is able to assess the oral cavity appropriately for signs and symptoms of oral diseases such as gingivitis, periodontitis and caries? When we



combine the oral health practitioners' knowledge of oral diseases with the evidence that oral health can be influenced by DM and that metabolic control of DM can be influenced by oral infections and inflammatory diseases, it is clear that dentists and dental hygienists are in the perfect position to offer patients with DM proper education in these areas.

My experience in managing the care of patients with DM and in speaking to audiences of dental and medical practitioners about DM and oral health suggests that many physicians are unaware of the interrelationship between oral health and DM. They are surprised to learn that DM can result in xerostomia or an increased risk of developing dental caries, periodontal diseases or other oral conditions. They also often are unaware of the evidence showing that inflammatory periodontal diseases may have an adverse effect on glycemic control in people with DM. My physician colleagues often say "I had no idea" when they see what oral infections and inflammatory diseases look like and learn of these relationships. Physicians are aware that infections can wreak havoc with DM control, but they may not understand that diseases dentists evaluate and treat every day, such as periodontitis, can have a major effect on glycemic control.

Through close and expanding interactions between the medical and dental communities, efforts are being made to improve education and cooperation between the professions that will benefit our patients. At the American Diabetes Association's 68th Scientific Sessions in June 2008, a scientific session on links between periodontal disease and DM was held for the first time. Dental clinicians and researchers presented scientific evidence linking oral health and disease with DM and glycemic control to their medical colleagues. Organizations such as the American Dental Association and the American Academy of Periodontology have held symposia with physician groups to explore the current state of knowledge in the DM–oral health relationship and have outlined directions for future research.

The importance of oral health in a DM management regimen was acknowledged formally by the American Diabetes Association in Standards of Medical Care in Diabetes: 2008.⁸ The American Diabetes Association lists the following referrals as components of the comprehensive DM evaluation: annual dilated eye examination, family planning for women of reproductive age, a regis-

tered dietician for medical nutrition therapy, DM self-management education, dental examination and mental health professional, if needed. Thus, the national DM organization explicitly recognizes for the first time that people with DM need to see a dentist for appropriate evaluation and treatment of oral diseases as part of the DM evaluation.

WHAT SHOULD DENTISTS DO?

Dentists may wonder what their role should be in managing the care of a patient with DM or in evaluating a patient for a poorly controlled or undiagnosed diabetic condition. Diagnosing DM is in the realm of the physician. Dentists, however, can evaluate patients for signs or symptoms of poorly controlled or undiagnosed DM and then refer them to a physician for formal medical evaluation and diagnosis. In this supplement, Lamster and colleagues⁴ address the oral conditions associated with DM. When these conditions arise and dentists suspect that patients may have undiagnosed DM or that DM is controlled poorly, they should refer these patients to physicians for evaluation. In addition, dentists should ask patients about their family history of DM and the presence of the classic signs and symptoms of DM such as polyuria (excessive urination), polydipsia (excessive thirst), polyphagia (excessive sense of hunger), recent onset of blurred vision or recent weight loss. If family history is positive for DM and such signs or symptoms are present, dentists should inform the patients' physicians.

Since scientific evidence suggests that DM has its greatest potential effect on oral health when glycemic control is poor, it is important for dentists to assess blood glucose control in people with DM. Physicians generally use the glycosylated hemoglobin (HbA_{1c}) assay to determine patients' approximate glycemic control across time; higher average blood glucose levels correlate with higher HbA_{1c} values (Table 1).⁹ A normal HbA_{1c} value is less than 6 percent. An HbA_{1c} measurement reflects the average blood glucose concentration across the preceding one to three months, and HbA_{1c} levels correlate well with the development of diabetic complications.^{1,6-8} The American Diabetes Association provides glycemic control target goals for both HbA_{1c} and capillary glucose levels (Table 2).⁸ Dentists should be aware that most

ABBREVIATION KEY. DM: Diabetes mellitus. HbA_{1c}: Glycosylated hemoglobin.

TABLE 1

Correlation between HbA_{1c}* levels and average plasma glucose levels.†	
HbA_{1c}‡ LEVEL (%)	AVERAGE PLASMA GLUCOSE LEVEL (MILLIGRAMS PER DECILITER)
6	135
7	170
8	205
9	240
10	275
11	310
12	345
* HbA _{1c} : Glycosylated hemoglobin.	
† Source: Rohlfing and colleagues. ⁹	
‡ HbA _{1c} provides an estimate of the average glucose level. It does not account for short-term fluctuation in plasma glucose levels.	

TABLE 2

Glycemic recommendations for adults with diabetes mellitus.*	
LABORATORY/GLUCOMETER PARAMETER	RECOMMENDATION
Glycosylated hemoglobin	< 7.0 percent†
Preprandial capillary glucose	70-130 milligrams per deciliter
Peak postprandial capillary glucose one to two hours after beginning of a meal	< 180 mg/dL
* Source: American Diabetes Association. ⁸	
† The reference range for normal glycosylated hemoglobin is 4.0 to 6.0 percent.	

patients with DM do not reach target HbA_{1c} levels. In fact, only about 37 percent of people with type 2 DM attain an HbA_{1c} of less than 7 percent.¹⁰

The easiest way for dentists to assess the glycemic control of patients with DM is to consult the patients' physicians and ask for the HbA_{1c} values. My preference is to ask a patient's physician for at least the last two years of HbA_{1c} values, which lets me assess the level of average glycemic control for the past few months and the presence of any fluctuations for two years. Dentists also should inform physicians about any oral signs of infection or other problems that may affect glycemic control. Because the resolution of infections may be associated with improved glycemic control, dentists may wish to ask that an HbA_{1c} test be performed after treating oral infections and inflammatory periodontal diseases in patients with DM to determine if any changes in

glycemic control have occurred.

Dentists do not communicate with patients with DM and their physicians as well as they might. The results of a recent study of general dentists and periodontists showed that 77 percent of periodontists and 44 percent of general-practice dentists always asked patients with DM what type of DM they have.¹¹ The results also showed that only 35 percent of periodontists and 14 percent of general-practice dentists consistently communicated with physicians concerning their patients with DM, and that 28 percent of periodontists and 14 percent of general-practice dentists objectively evaluated glycemic control by consulting physicians about the results of laboratory tests such as the HbA_{1c} assay. Communication among dentists, physicians and patients is an area ripe for improvement.

WHAT SHOULD PHYSICIANS DO?

In accordance with the American Diabetes Association's 2008 standards for medical care of DM, patients with DM should be

referred to a dentist to have their oral health assessed as part of the overall evaluation of DM.⁸ By simply asking patients when they last visited a dentist, physicians may start an important conversation and enhance interactions among patients, dentists and physicians. Physicians should be aware of the effects oral infection and periodontal inflammation have on achieving ideal glycemic control.¹² Physicians, nurses and diabetes educators play an important role in educating patients with DM about how these conditions may affect glycemic control. They also can facilitate treatment of such conditions and maintenance of oral health by reinforcing the importance of oral health in the overall scheme of DM management.

One of the most important things physicians can do to help their dental colleagues is to provide the results of laboratory tests such as HbA_{1c} to dentists on request. Dentists can use this infor-

mation to assess patients' risks of experiencing progressive periodontal destruction, which can be greater when glycemic control is poor. Dentists also can use HbA_{1c} results to help assess the risk of a patient's experiencing hypoglycemia in the dental office.¹³

CONCLUSION

This supplement is designed to emphasize both the systemic and oral health aspects of DM. We hope it will facilitate expanded communication among patients, dentists and physicians and lead us closer to a goal of improved health care for people with DM. ■

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