

Diabetes Mellitus and Oral Health: Ignoring the Evidence May be a Costly Mistake

September 2014



Authors:

Katherine Cohen, MSN, RN, PHN
Conrado E. Bárzaga, MD

About COH:

Center for Oral Health (COH), is a non-profit organization dedicated to promoting public oral health, with a focus on children and vulnerable populations. Since 1985 COH collaborates with national, state, and local partners to develop innovative community-based strategies for improving oral health outcomes. Currently COH has offices in Northern and Southern California.

This brief is made possible in part by grants from Colgate Oral Pharmaceuticals and The California Wellness Foundation

Introduction

The fields of medicine and dentistry both pursue the diagnosis, treatment and prevention of diseases affecting humans. Although both healthcare fields treat the same human body, medicine and dentistry have traditionally been separated. New evidence increasingly appears to show strong connection between conditions in the oral cavity and systemic diseases. This issue brief will explore the connection between two highly prevalent and costly diseases, **periodontal disease** and **diabetes mellitus**. Adults age 45 and older who have poorly controlled diabetes are almost 3 times more likely to have severe periodontal disease. People with both periodontal disease and diabetes are more likely to have higher medical expenses. These two conditions, highly prevalent, chronic, progressive, and often undetected, are diagnosed and treated by the two healthcare fields that continue to be separated. This separation, it seems, might be a costly mistake.

Background

Severe periodontal disease often coexists with severe diabetes mellitus. Diabetes is a risk factor for severe periodontal disease and periodontal disease increases the severity of diabetes mellitus and complicates metabolic controlⁱ. In other words, these two conditions are pervasively correlated, where one worsens the other and vice versa.

Diabetes Mellitus is a disease that affects the body's ability to control blood sugar. Diabetes Mellitus is one of the top 10 leading causes of mortality in the U.S.ⁱⁱ It is also a leading cause of morbidity and disabilityⁱⁱⁱ. As of 2012, there were more than 29 million people with diabetes in the United States^{iv}. This represents almost 10% of its population. The economic impact of diabetes in the U.S. is estimated at \$245 billion^v, which is approximately 20% of total dollars spent on health care. Although there are several different types of diabetes mellitus, by far the most prevalent is Type II diabetes mellitus, which is caused by a combination of lifestyle factors and genetics, and accounts for between 90% and 95% of all diagnosed cases^{vi}. Type I diabetes mellitus is caused by genetics, and accounts for approximately 5% of all diagnosed cases.

Individuals with diabetes are more likely to suffer from cardiovascular disease, kidney disease, and periodontal disease, and the severity of these problems increases in individuals the longer diabetes goes undetected or unmanaged. Simple questions and blood tests can be used to screen and test for diabetes, which can be completed in a variety of healthcare provider visits, including both medical and dental.

The Centers for Disease Control and Prevention (CDC) estimates there are more than 29 million people with diabetes. This includes both diagnosed and undiagnosed individuals. In order to properly manage diabetes, the patient must follow recommended dietary and exercise guidelines, and possibly take prescription medication.

Pre-diabetes is a serious health condition that increases the risk of developing diabetes. To be pre-diabetic, one must have a higher blood sugar level than normal, but not yet high enough to be diagnosed with diabetes. Individuals with pre-diabetes can help delay or even prevent the onset of diabetes with proper dietary and lifestyle changes, so it is important to screen those with diabetes risk factors at each healthcare provider visit.

People affected by diabetes are at a higher risk of developing periodontal infections^{vii}.

Periodontal disease is an inflammatory disease that affects the soft and hard structures that support the teeth. In its early stage, called *gingivitis*, the gums become red, swollen and bleed easily due to inflammation, which is the body's natural response to the presence of harmful bacteria. Gingivitis does not include bone or tissue loss, and can typically be reversed with regular dental visits and daily brushing and flossing. A more serious form of periodontal disease is *periodontitis*, which occurs when gingivitis is not treated, and thus advances.

Periodontitis is a very complex condition that is characterized by retraction of the gums from the tooth. When *periodontitis* becomes severe, the gums become very inflamed due to toxins released by harmful bacteria and the body's own immune system response. If not treated, the inflammation will lead to increasing soft tissue and bone damage, and eventually the loss of teeth.^{viii,ix}

Periodontitis affects nearly half of the U.S. adult

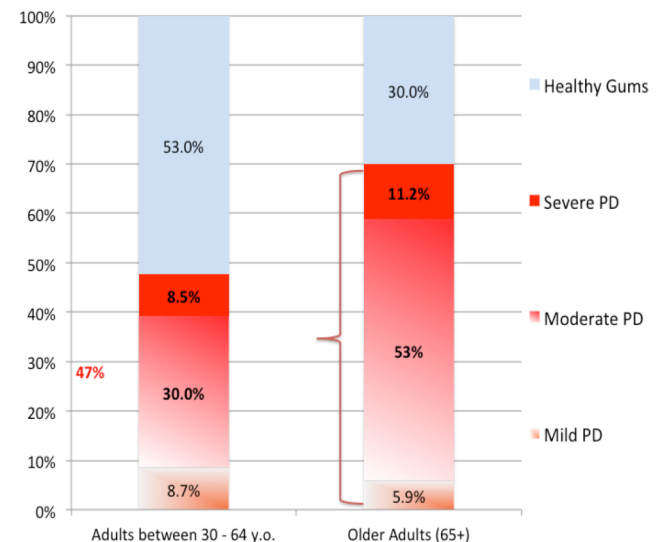


Figure 1 Source: Periodontal Disease in Adults in the U.S. 2010 Centers for Disease Control and Prevention (CDC)

population between the ages of 30 and 64 and 70% of those 65 and older^x (figure 1). The chronic infections associated with *periodontitis* have been implicated in the pathogenesis of chronic inflammation that impairs general health.

Approximately one third of individuals with diabetes have severe periodontal disease, with the loss of attachment between the bones and gums being 5 millimeters or more^{xi}. Uncontrolled periodontal disease can make it more difficult for diabetics to control their blood sugar. Adults age 45 and older who have poorly controlled diabetes are almost 3 times more likely to have severe periodontitis, and if that person also is a smoker that number increases to almost 5 times more likely to have severe periodontitis^{xii}.

Periodontal disease, and the resulting tooth and gum damage, impacts an individual in a variety of ways. Diet can be affected, as tooth and gum damage can decrease the quantity of fresh fruits, vegetables, and whole grains consumed. The individual may become more reliant on a highly processed diet, which has been demonstrated to further exacerbate diabetic, cardiovascular, and oral health conditions by decreasing the nutrient value in the diet, decreasing the amount of fiber in the diet, and exposing the body to chemicals that increase the inflammation response - all of which can further exacerbate cardiovascular and oral health conditions.

Since the connection between oral health and general health is well documented^{xiii}, it is important to identify integrated systems of care, where medical and dental professionals collaborate and refer bi-directionally.

The direct and indirect costs of diabetes are an enormous burden to the individual, their family, taxpayers, government entities, and private businesses. Direct costs include medical care, drugs and insulin, diabetic supplies, increased health and life insurance fees, healthcare provider services, surgeries, and lab tests. Indirect costs include job loss, decreased worker productivity for companies, disability payments, and lost payments from early retirement and premature mortality. These costs do not include the intangible costs associated with diabetes, including pain and anxiety, inconvenience, and spousal or familial relationship strain. They also do not include associated direct and indirect dental costs, which can be excessive.

The Burden of Ineffective Public Policies

Medicaid, the Federal program that provides health coverage for low-income families does not mandate adult dental coverage. This results in Medicaid dental benefits for adults being optional. Many states cover only emergency services or have fairly low caps on adult dental expenditures.

During the financial crisis of 2009, the State of California eliminated dental benefits for Medicaid's adult beneficiaries. These benefits were partially reinstated as of May 1st, 2014. Periodontal maintenance remains excluded from the list of restored benefits.

It is expected that the partially restored dental benefits will increase the number of individuals who can receive some dental care, however individuals with diabetes, who may need regular periodontal maintenance will continue to face the absence of needed dental coverage, and remain unable to maintain good oral health. Dental care, without the benefit of insurance or government-supported programs, can be cost prohibitive, particularly for low-income individuals and families.

There is increasing scientific evidence that treating periodontal disease reduces medical costs (*figure 2*). In one Cigna study the medical cost savings amounted to approximately \$1,418 per patient in the first year of dental coverage.^{xiv} Another study, this one conducted by United Healthcare, showed a reduction of \$1,750 per year in the cost of care when patients receive periodontal treatment^{xv}. A 2013 retrospective study conducted by Aetna, Inc. on 1.5 million patients suggests that dental-medical integration models result in less hospital admissions (-3.5%); lower medical claims costs (-17%); less dental claims for major/basic services (-42%); and improved diabetes control (+45%)^{xvi}.

Other studies have shown that periodontal treatment leads to an improvement of glycemic control in patients with type 2 diabetes mellitus for at least 3 months^{xvii}. A recent landmark study conducted by United Concordia examined almost 350,000 patients with periodontal disease and found that good periodontal maintenance resulted in a reduction of healthcare costs of 40.2% or \$2,840, for patients with type 2 diabetes, and 39.4% reduction in hospital admissions^{xviii}.

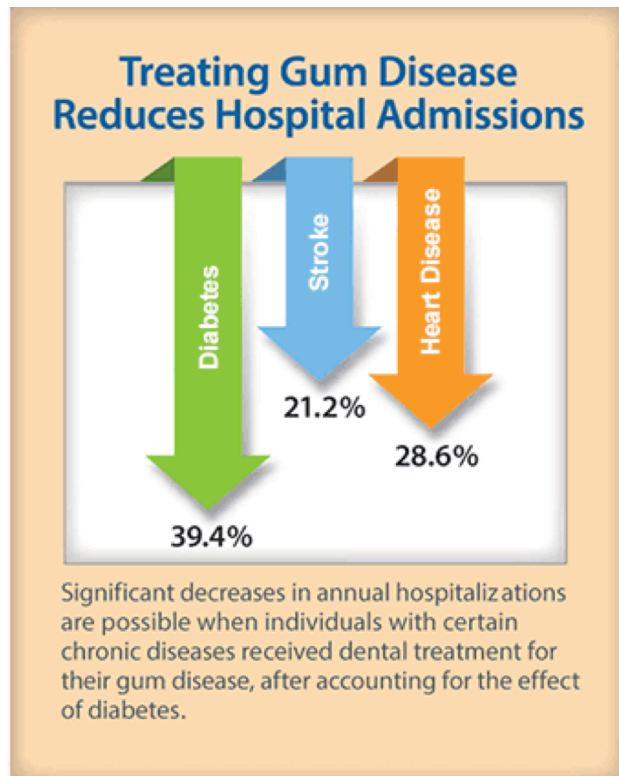
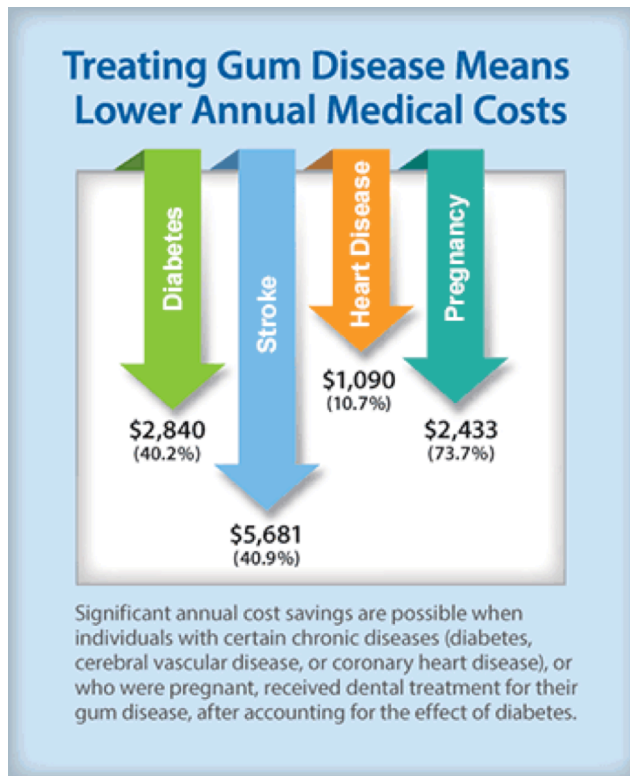


Figure 2 Source: Impact of Periodontal Therapy on General Health. 2014 American Journal of Preventive Medicine

In spite of these scientific and economic findings, the new healthcare law overlooks adult dental benefits, and state sponsored health plans continue to limit dental benefits to their members under a seemingly erroneous believe that less dental benefits translate in state savings.

The Affordable Care Act (ACA) was passed in 2010, and in 2014 the personal mandate came into effect. The state and federally run healthcare exchanges have created affordable healthcare options for individuals that fit a variety of healthcare needs and income levels. Though there are many components to the law, one in particular is the requirement that nearly all citizens obtain medical coverage or face a financial penalty. The ACA also stipulates that all health plans offered through insurance programs must include essential health benefits, which are services that must be covered regardless of cost of the premium, or gender or age of the individual. Dental benefits, however are not included for adults.

Though some Denti-Cal services have been reinstated for California residents below a certain income threshold, there is no requirement for individuals being enrolled through the insurance exchange to maintain dental coverage, as opposed to the newly instituted health insurance mandate for medical coverage, which requires almost all U.S. citizens to obtain health insurance coverage either through private insurance, state and federal-run insurance markets, or government programs. Likewise, dental insurance plans that are offered through private markets are not mandated to cover certain services.

The ability to afford dental care is a large barrier to access.^{xix,xx} According to the 2008 National Health Interview Survey, 45 million Americans under the age of 65 with private medical insurance had no dental coverage, while those with low income and low education attainment were even less likely to have coverage.^{xxi}

Recommendations

Based on analysis conducted by the authors and available evidence cited by this brief, the following recommendations must be considered by policy-makers and administrators at federal and state levels:

1. Include periodontal maintenance (PM) as a mandatory benefit for adults covered by Medicaid. Allow a periodicity of four (4) PM per year, as data suggests that this interval will result in decreased likelihood of progressive disease compared to patients receiving PM with less frequency.^{xxii}

2. Establish mechanisms for medical providers to refer Medicaid beneficiaries with diabetes mellitus to dental care providers for a **comprehensive periodontal evaluation**, and if needed establish PM treatment. As recent data shows, good periodontal maintenance results in a significant reduction of healthcare costs: 40.2% reduction in medical care for patients with type 2 diabetes and a 39.4% reduction in hospital admissions for patients with the same condition.

3. As with medical coverage, dental coverage should be mandated within the U.S., in order to increase the number of affordable, quality options to access dental care. Evidence shows that dental coverage improves access to and use of dental care services^{xxiii}. In general terms, when previously uninsured adults with diabetes become eligible for Medicare, their health improves^{xxiv}.

4. Cooperation between dental and primary care for high blood glucose screening and follow-up appears to be a feasible method for early diagnosis of diabetes^{xxv}. Therefore, given the large number of Americans estimated to have undiagnosed type 2 diabetes mellitus, dental healthcare professionals should screen for, and be provided a reimbursement code for, diabetes and pre-diabetes at each visit by obtaining a history and completing indicated blood tests.

Conclusions

There is strong scientific evidence that severe periodontal disease often coexists with severe diabetes mellitus. There is strong evidence that treating periodontal disease reduces the cost of medical care in patients with type 2 diabetes mellitus. The authors encourage policy makers and regulators to explore ways to support an integrated approach to healthcare that includes better understanding of the mouth-body connection, better oral health care coverage, and closer collaboration between medicine and dentistry in order to improve health outcomes, provide patient-centered care, and reduce costs of health care.

About the Authors

Katherine Cohen, MSN, RN, PHN. MSN-E, Class of 2014. Western University of Health Sciences

Clinical Assistant Professor, Western University of Health Sciences

Family Nurse Practitioner student, Western University of Health Sciences

Conrado E Bárzaga, MD:

Executive Director, Center for Oral Health, Pomona, California, USA

Adjunct Faculty, Western University of Health Sciences.

Disclosures

Funding sources:

Ms. Cohen: Colgate Oral Pharmaceuticals, Center for Oral Health.

Dr. Bárzaga: Center for Oral Health.

Conflict of Interest:

Ms. Cohen: None.

Dr. Bárzaga: None.

The views expressed in this brief do not necessarily reflect the views of the Center for Oral Health. This brief is a work in progress and/or is produced in parallel with other briefs contributing to other work or formal publications by Center for Oral Health. Comments are welcome; please direct them to Dr. Conrado Bárzaga at cbarzaga@tc4oh.org

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