

▶ Oral Health Diseases
Among Top Risk Factors for
Diabetes Mellitus and Comor-
bidity

From Your Dentistry for Diabetics (DFD) Professional
Share this newsletter with other health professionals in your office

▶ Convergence of Risk and
Response will Decide the
Health Outcome for Diabetic
Patients

Pass it on!

▶ Gum Disease, Smoking
& Diabetes

Informed

The truth about the diabetic & oral care

A Review of the Most Compelling Research into Oral Health and Diabetes

Hundreds of research studies have been performed in the last fifty years that show a clear connection between oral health and overall health. We've reviewed a vast number of them during the last year. This body of research suggests that oral diseases such as periodontitis, tooth loss and xerostomia affect management goals – including dietary goals, glycemic control and inflammation response. All of which affect the patient's ability to live a healthy, vital lifestyle and to prevent or delay onset of systemic complications.

Still more research shows patients who have diabetes are more vulnerable to oral diseases than systemically healthy individuals. For patients without metabolic control, oral diseases may advance more quickly.

This month, we will review some of the most compelling research leading up to 2008 that probes the connection between oral and systemic health.



Did You Know?

Some experts believe periodontal disease may be the most important risk factor associated with diabetes mellitus.

Oral Health Diseases Among Top Risk Factors for Diabetes Mellitus and Co morbidity

“Periodontal disease may be the most important of all the factors known to contribute to diabetes onset, including age, gender, obesity and smoking,” according to Sara Grossi, DDS and Clinical Professor of Oral Biology, University of Buffalo.

Among lifestyle risk factors, smoking and obesity are often cited as the top two contributors. However, because periodontal disease can be both a causal factor and an effect of diabetes mellitus, its impact may be even greater than that of smoking and obesity.

Diabetic patients are up to 3.4 times more likely to contract periodontitis due to characteristic delayed wound healing and inhibited immune response. In addition, type 2 diabetes and decreased insulin sensitivity, have been associated with the production of advanced glycation end-products (AGE), which trigger inflammatory cytokine production, thus predisposing for inflammatory diseases such as periodontitis.¹

Periodontitis has also been linked to increased insulin resistance among pre-diabetic subjects. Periodontitis induces production of pro-inflammatory cytokines such as TNF- α , IL-1, and IL-6.²

This may be followed by secretion of tumor necrosis factor-alpha (TNF- α) by adipose (fatty) tissue triggered by lipopolysaccharides from periodontal gram-negative bacteria, which may promote hepatic dyslipidemia and decrease insulin sensitivity.³

Xerostomia May Also be a Top Risk Factor

Among the many oral diseases that have a negative,

The peptide, salivatan, found in human saliva, has been shown to lower blood glucose after meals and to help maintain glucose levels overall.

two-way relationship to diabetes, xerostomia may be one of the most damaging.

With the common name of “dry mouth”, xerostomia occurs when the salivary glands of the mouth slow or cease production. Diabetic patients are more susceptible to xerostomia than systemically healthy individuals due to a common complication that causes degeneration of the salivary glands themselves.

And its impact can be severe.

For the non-diabetic individual, reduced salivary production may result in severely increased dental caries (cavities) and gingivitis. This occurs as bacteria and plaque are not washed away on a regular basis. However, for the person with diabetes, xerostomia can speed the advance of periodontal disease, cause painful mouth ulcers and make it difficult to wear prosthetic teeth.

What may be far worse is that it may also affect blood glucose levels.

The peptide, salivatan, found in human saliva, has been shown to lower blood glucose after meals and to help maintain glucose levels,

Check it out:

In the year since this newsletter was released, 1.5 million new cases of diabetes have been diagnosed in people over 20 years of age.

through glucose-stimulated release of insulin.⁴

“Oral health and general health are inseparable.”

-U.S. Surgeon General
Dept of Health and Human Services
Oral Health in America 2000

When it is not present in sufficient amounts, glycemic levels may become dangerously low.

Interestingly, two factors increase the likelihood that the diabetic patient will contract xerostomia.

1. Many of medications used to treat diabetic complications can trigger the degeneration of salivary glands that results in xerostomia. A key reason why collaboration between prescribing members of the diabetic care team should share information.

Convergence of Risk and Response will Decide the Health Outcome for Diabetic Patients

If all the research we have reviewed in this and previous *Informed* newsletters throughout the past year is true, there must certainly be systemic connection between oral health and overall health for the diabetic patient.

Now Consider This:

As all diabetic care practitioners are aware, lifestyle choices remain the most important and challenging factor when it comes to effective management. Yet obesity rates continue to rise, tobacco use remains dangerously high at 19% for diabetic individuals. Xerostomia, candidiasis and periodontal disease (and associated tooth loss, alveolar bone loss and endentulism) are also on the rise.¹⁻⁵

With each poor choice in lifestyle, the impact to the diabetic patient becomes multiplied. In addition, the ability of the physician, dietician, medical specialist and dentist to treat and manage the patient's health is

2. Like many complications associated with diabetes mellitus, the longer the patient lives with diabetes (especially poorly controlled diabetes), the greater the risk that he or she will develop degeneration of the salivary function.

Management of xerostomia can be achieved with the aid of saliva substitutes, salivary stimulants and other dental therapies, which may also help to prevent future dental caries.

1. N. Pischon*, N. Heng, J.-P. Bernimoulin, B.-M. Kleber, S.N. Willich¹, and T. Pischon^{1,2}. Obesity, Inflammation, and Periodontal Disease, 2007. *J Dent Res* 86 (5):400-409
2. Ibid
3. T. Saito, Y. Shimazaki, T. Koga, M. Tsuzuki, and A. Ohshima. Relationship between upper body obesity and periodontitis. *J. Dent. Res.* 2001 80: 1631-1636.
4. I. Kimua, et al. Reduction of incretin-like salivatin in saliva from patients with type 2 diabetes and in parotid glands of streptozotocin-diabetic BALB/c mice. *Diabetes, Obesity and Metabolism*, 2001. Vol. 3, No. 4, 254 - 258

exponentially diminished.

The result is often far greater dependence on medication than necessary and increased rate of comorbidity.

However, according to researchers and clinical observation by dentists from *DentistryforDiabetics*, rigorous, oral care is often the missing ingredient in successful, comprehensive diabetes management.

We know this because, when diabetic patients who also have periodontitis (who present with poor glycemic), are treated with aggressive oral health methods including debridement and antimicrobial methods (along with their normal medications) – glucose levels often normalize.⁶

Did you know?

Diabetes is just one of many diseases that are sometimes first diagnosed in the dentist's office.

Gum Disease, Smoking & Diabetes

Glycemic control, age/duration of illness and smoking are among the top risk factors affecting management and health of the diabetic. Not coincidentally, they are also high-risk factors for oral health diseases.

Poor glycemic control + diabetes = 2.0 to 3.4-fold risk of periodontitis

Smoking + diabetes = 6-fold risk of contracting periodontal disease

Smoking + 10 years living with diabetes mellitus = increases the risk of developing periodontal disease up to 10X

Age + diabetes = increased risk of xerostomia (due to meds and salivary degeneration)

What's worse. **Periodontal disease and xerostomia are often the first two diseases in a long line of oral diseases that can affect overall health.** Tooth loss, edentulism, bone loss, oral lesions, fungus (oral candidiasis) and burning mouth syndrome – all potential outcomes of poor glycemic control, diabetes and smoking.

Yet 81.5% of diabetic patients are unaware of the increased risks associated with oral health disease.

In Sum

While treating oral disease is the purview of diabetically-aware dentists, identification of increased risk by physicians, nurses, certified diabetic educators and dieticians can prevent serious and irreversible oral damage.

By working together, sharing patient histories and treatment changes, medical and oral health professionals can preserve the health of the patient while making diabetes management easier for all.

1. N. Pischon¹, N. Heng, J.-P. Bernimoulin, B.-M. Kleber, S.N. Willich¹, and T. Pischon^{1,2}. Obesity, Inflammation, and Periodontal Disease, 2007. *J Dent Res* 86 (5):400-409
2. T. Saito, Y. Shimazaki, T. Koga, M. Tsuzuki, and A. Ohshima. Relationship between upper body obesity and periodontitis. *J. Dent. Res.* 2001 80: 1631-1636.

3. RJ Genco, SG Grossi, A Ho, F Nishimura, Y Murayama. A Proposed Model Linking Inflammation to Obesity, Diabetes, and Periodontal Infections. *Journal of Periodontology*, 2005 - Am Acad Periodontology.
4. Grossi SG, Genco RJ. Periodontal disease and diabetes mellitus: a two-way relationship. *Ann Periodontol* 1998;3(1):51-61
5. Toshimi Sairenchi, et al. Cigarette Smoking and Risk of Type 2 Diabetes Mellitus among Middle-aged and Elderly Japanese Men and Women. *Am J Epidemiol* 2004; 160:158-162.
6. Loos et al., 2000; Wu et al, 2000; F. Nishimura and Y. Murayama*. Periodontal Inflammation and Insulin Resistance- Lessons from Obesity *J Dent Res* 80(8):1690-1694, 2001

RESOURCES

For more information about **DentistryForDiabetics** or to find a DFD-trained practitioner:

Visit www.dentistryfordiabetics.com

Phone the dentist whose name appears at the bottom of this newsletter.

From:

To: