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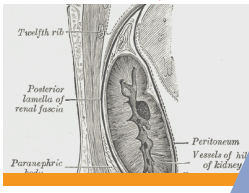

Dentistry for Diabetics™

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Informed

The truth about the diabetic & oral care

Risks & Rewards: Part 3

The last two installments of *Informed* have examined a wide array of risk factors that contribute to diabetes and periodontal disease. Not surprisingly, the research reviewed suggested that the two shared many lifestyle, environmental and hereditary risk factors.

What may have been somewhat surprising, was the shear number of shared risk factors—nine in total. In addition, findings suggested that periodontal disease is not simply a comorbidity for diabetes. It is also a significant risk factor itself.

In this third and final segment of "Risk and Rewards of Diabetes and Periodontal Disease", we will examine new research into the specific relationship between diabetes and periodontal disease, and why some researchers believe periodontal disease may in fact lead to diabetes.

Did You Know?

Interest in the syndemic approach is driven by growing evidence of the regularity of interactions among inflammatory diseases, and recognition that this interaction influences the disease's course.

Diabetes and Periodontitis, and a Focus on Inflammation

In the last two issues of *Informed*, we explored the various risk factors associated with diabetes and periodontal disease, with the goal of understanding how the presence of one or more of these risk factors may affect or itself be affected by diabetes or periodontal disease. What we found was that, in many cases, the presence of these risk factors not only increased the chance of developing diabetes or periodontal disease—but that diabetes and periodontal disease themselves become risk factors, each for the other, suggesting that the presence of one significantly increases disease course, expression, severity, and diffusion for the other.

These findings are supported by a study performed by Columbia University Mailman School of Public Health in 2008. According to Ryan T. Demmer, PhD, MPH, associate research scientist in the department of epidemiology at Columbia, who lead the study, the study's findings suggest that periodontal disease may lead to diabetes.[1]

Incident diabetes odds increased by 40% among participants with gingivitis (P<0.05) and by 50% among participants with periodontitis (P<0.05) compared with periodontally healthy participants.

"We found that over two decades of follow-up, individuals who had periodontal disease were more likely to develop type 2 diabetes later in life when compared to individuals without periodontal disease," says Demmer.

Specifically, Demmer et al found incident diabetes odds increased by 40% among participants with gingivitis (P<0.05) and by 50% among participants with periodontitis (P<0.05) compared with periodontally healthy participants.[2]

Those findings remained, even after multivariate adjustment for potential confounders including age, smoking, obesity, hypertension and dietary patterns. Demmer went on to conclude that the link between the two diseases may be due to inflammation resulting from the bacterial infections that often contribute to clinical periodontal diseases.

David R. Jacobs, PhD, professor in the division of epidemiology and community health at the School of Public Health, University of Minnesota, and a co-author of the study, concurred. "It is possible that these bacterial infections could also contribute to chronic elevations in systemic inflammatory mediators (ie, tumor necrosis factor-alpha). Studies have shown that inflammatory mediators such as TNF-alpha can induce insulin resistance, possibly via disruption of signal transduction pathways – inflammation associated with or caused by periodontal disease could lead to diabetes."

A Syndemic Approach

What is the true nature of the relationship between diabetes and oral health? Is it simply a two-way connection with infection and inflammation?

Some research suggests there is much more to the question.

As we all know, certain populations are at increased risk for developing diabetes. However, as the research reviewed in parts 1 and 2 of this three-part series "Risk and Rewards of Diabetes and Periodontal Disease" suggests, the problems associated with these

Check it out

Increasing rates of obesity have been measured in many American Indian and Alaska Native communities. In Pima Indians, 95 percent of those with diabetes are overweight.

— INational Diabetes Information Clearinghouse. (2002) "Medical and Lifestyle Risk Factors" in ***Diabetes in American Indians and Alaska Natives***. NIH publication no. 02-4567.

two diseases and their risk factors go beyond simple co-occurrence. Periodontitis and diabetes do not act as discrete diseases co-inhabiting the same system. Instead, they act as an interrelated cluster of inflammatory maladies that includes obesity, insulin resistance, chronic infection, hypertension, hyperlipidemia, etc.

When coupled with lifestyle, genetic and environmental factors, each multiplies the risk for the individual, rather than simply adding to it. Which suggests that populations that are already predisposed to diabetes and periodontal disease, such as the elderly, those at lower socio-economic levels, those living in rural regions, recent immigrants, and people of color, become increasingly vulnerable to diabetes and periodontal disease, not based on a single factor, but based on multiple factors. And all must be addressed in order to achieve success in management and prevention.

For example, research shows that women of lower socio-economic status, in particular, are at increased risk for both diabetes and periodontitis. If the individual is African American, American Indian, Haitian (or of other non-European descent), her risk factor increases. And, as mentioned earlier, if she has diabetes, her risk for developing periodontitis is up to 3.4 times greater than systemically healthy individuals.[3-4] In addition, impaired host response and magnified collagenolytic activity associated with diabetes may lead to advanced stage periodontal damage and infection.[5]

If she does not have diabetes at the time of periodontal infection, the gingival infection associated may trigger systemic inflammation that in turn increases insulin resistance in pre-diabetics and increases blood glucose levels in patients living with diabetes.[6-7]

However, when patients with diabetes, who also have periodontal disease, are treated with rigorous oral care and educated about the interrelated nature of diabetes and oral health, glucose levels often normalize—and long-term success increases.

All of which suggests that a syndemic approach to prevention and treatment to address the complex forces acting on the individual may be the most logical care option for the diabetic practitioner. To reduce risk factors for all at-risk groups, both the American Diabetes Association and the American Dental Association recommend oral screening to reduce periodontal risk, and risk for developing diabetes.

In the United States, all people of color have a higher chance of developing diabetes than white people. Recent research suggests that people with diabetes are less likely to exercise and more likely to be overweight, or at least have an increased percentage of abdominal fat.

— Kissebah, A.H., et al. (1982) "Relationship of Body Fat Distribution to Metabolic Complications of Obesity." ***Journal of Clinical Endocrinology and Metabolism*** 54:254-260.

Over time, many cultures have eschewed traditional healthful foods for more readily obtained high-calorie, high-fat, high-salt, or high-sugar foods. Recommendations to increase dairy consumption go against the cultural dietary habits (and the lactose tolerance) of most people of color -- 90 percent of the world's population, in fact.

— Beyer, P.L. "Focus on Lactose Tolerance: An Uncommon Anomaly?" Mahan, L.K., and Escott-Stump, S. (eds.), ***Krause's Food, Nutrition, and Diet Therapy***. Philadelphia, PA: Saunders, 2004 30:720.

Did you know?

Many people of color, especially women, develop diabetes in their 30s and 40s and sometimes their 20s, long before they are considered "elders."

1. Demmer RT, Jacobs DR, Desvarieux M. Periodontal disease and incident type 2 diabetes. *Diabetes Care*. 2008;31:1373-1379.

2. Ibid.

3. Nelson RG, Shlossman M, Budding LM, et al. Periodontal disease and NIDDM in Pima Indians. Diabetes Care 1990;13:836-840.

4. N. Pischon*, N. Heng, J.-P. Bernimoulin, B.-M. Kleber, S.N. Willich[1], and T. Pischon[1,2.] Obesity, Inflammation, and Periodontal Disease, 2007. J Pent Res 86 (5):400-409

5. Ryan ME, Carnu O, Kamer A. The influence of diabetes on the periodontal tissues. JADA 2003;134(supplement 1):34S–40S.

6. Vernillo AT. Dental considerations for the treatment of patients with diabetes mellitus. JADA 2003;134(supplement 1):24S–33S

7. Taylor GW. The effects of periodontal treatment on diabetes. JADA 2003;134(supplement 1):41S–48S.

What's Clicking? Screening for Periodontal Disease

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. It can also help improve overall health and make diabetic management easier, while decreasing morbidity rates.

Below is an excerpt from the *DentistryForDiabetics*SM screening protocol, an increasing number of physicians are using to evaluate patients for oral health risk.

To learn more about *DentistryForDiabetics* screening tools, visit www.DentistryForDiabetics.com.

ORAL HEALTH EVALUATION

Has the patient seen a dentist for treatment, exam or therapy during the last year? Yes / No

Has the patient had his or her teeth cleaned in the last year? Yes / No

VISIBLE ORAL FINDINGS

- Gums bleed when patient brushes or by themselves
- Swollen gums
- Bad breath that won't go away
- Loose or unstable teeth

ADDITIONAL FINDINGS

- Patient having trouble swallowing
- Cracked lips, including corners of mouth
- Complaints that prosthetic teeth no longer fit properly
- Missing teeth
- Erratic glycemic control with unknown etiology
- Receding gums
- Oral candida fungus
- Oral lesions
- Xerostomia
- Pain/discomfort when chewing

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