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# Informed

*The truth about the diabetic & oral care*

## Pregnancy, Diabetes & Periodontitis

If you are an ob/gyn physician or a physician treating diabetic patients, you know that diabetes may increase the risk of congenital abnormalities among babies born to mothers with existing diabetes.

You also know that gestational diabetes may increase the risk of pre-term babies or babies with macro-somia (among other morbidities).

But are you aware of the role periodontal disease may play in increasing

or decreasing these risk factors for diabetic patients or those who may develop diabetes during pregnancy?

This month, we take a probative look at what leading experts and researchers say about the impact periodontal disease may have on the diabetic state related to pregnancy, glycemic management and child birth.



**Did You Know?**

**Nearly one out of every two women with gestational diabetes also has periodontal disease.**

— Gabriella Pridjian, Xiong Xu and Pierre Buekens. Gum disease gestational diabetes link. Journal of Obstetrics and Gynecology 2006.

# Periodontal Disease Linked to Gestational Diabetes, Poor Glycemic Control (for those with existing Diabetes Mellitus)

Pregnancy and diabetes. The combination has become more common in the last 50 years, affecting approximately four percent (or ~135,000 new cases reported annually) of all pregnant women in the United States per year.

OB/GYN physicians face growing numbers of diabetic patients – made up of individuals with existing diabetes who become pregnant, as well as those who develop gestational diabetes. All of whom face complications – those affected include both mothers and children.

**Diabetic individuals who become pregnant and do not maintain healthy glycemic levels increase the risk of birth defects in their unborn child.**

What's more, research findings report that, of those women who develop gestational diabetes, as many as 9% develop type 2 diabetes later in life.

Infants born to mothers with diabetes face pre-term birth, low-birth weight and congenital abnormalities. Gestational diabetes may predispose children to oral health issues and diabetes later in life; it may also lead to macro-somia. In its *Standards of Medical Care Supplement (2007)*, the American Diabetes Association reports that "Major congenital malformations remain the leading cause of mortality and serious morbidity in infants of mothers with type 1 and type 2 diabetes."

Those morbidities may include respiratory problems, shoulder dysplasia, childhood obesity and diabetes for the child himself or herself.

Even as the American Diabetes Association reports the potentially serious affects of diabetes mellitus, the precise causal relationship is not known. However, evidence suggests that insulin resistance created by hormonal changes may be at its root.

Traditionally, diet and exercise have been the prescribed response to manage or prevent onset. However, there may be an additional, highly-treatable factor contributing to gestational diabetes and inhibiting management for those diabetic patients, who become pregnant.

Recent research has found links between periodontal disease and gestational diabetes. According to a study from Tulane University in New Orleans (2006), nearly one out of two women with gestational diabetes also has periodontal disease. In contrast, just over one in 10 pregnant women without gestational diabetes was found to have periodontal disease.<sup>1</sup>

Some researchers believe the connection may be due to systemic inflammation triggered by oral infection associated with periodontitis.

What's more, pregnancy may make women more vulnerable to periodontal disease. According to a study by Loe and Silness, "Changes in the gingiva include an increase in pregnancy gingivitis that usually starts during the second to third month of pregnancy and increases in severity through the eighth month, where it decreases along with the abrupt decrease in hormone secretion."<sup>2</sup>

These findings suggest a common vulnerability between gestational diabetes and periodontitis, caused by hormonal changes).

## Check it out:

**Studies have shown that periodontal treatment reduces inflammation-causing proteins (known as circulating TNF- $\alpha$ ) and serum levels of glycosylated hemoglobin, which helps regulate metabolism in type 2 diabetics.**

**According to the American Diabetes Association, treatment for gestational diabetes helps lower the risk of a cesarean section birth**

**that very large babies (especially those with macrosomia) may require.**

Several studies indicate pregnancy-induced gingivitis prevalence ranges from a low of 35% to a high of 100%, depending on the study.<sup>3-5</sup> When the patient does not receive the rigorous oral care needed during the second and third trimesters to combat gingival infection, the infection may advance to periodontitis –

## How Periodontitis May Trigger Inflammatory Response, Insulin Resistance in the Pregnant Individual

Increased risk factor for onset triggered by hormonal imbalances is not the only commonality between gestational diabetes and periodontitis. A study published in the *Journal of Periodontology* (1996) found that the presence of periodontal infection may increase the likelihood of a child born too early and too small by seven times. <sup>6</sup>

While the precise causal relationship is not fully understood, some researchers believe the bacteria that cause inflammation in the gums may also trigger the immune system to produce inflammation in the cervix and uterus. Such inflammation can cause premature labor.

**Periodontitis** induces production of pro-inflammatory cytokines such as TNF- $\alpha$ , IL-1, and IL-6. Some researchers believe inflammation is the precursor to insulin resistance.<sup>7</sup> And, while the precise relationship between periodontal disease and

which in turn may trigger the associated inflammatory response that may contribute to onset of gestational diabetes or poor glycemic control in those patients with existent diabetes.

1. Gabriella Pridjian, Xiong Xu and Pierre Buekens. Gum disease gestational diabetes link. *Journal of Obstetrics and Gynecology* 2006.
2. Loe H, Silness J. Periodontal disease in pregnancy. *Acta Odontol Scand* 1963;21:533-551.
3. Loe H, Silness J. Periodontal disease in pregnancy. *Acta Odontol Scand* 1963;21:533-551.
4. Hasson E. Pregnancy gingivitis. *Harefuah* 1966;58:224-230.
5. Lundgren D, Magnussen B, Lindhe J. Connective tissue alterations in the gingiva of rat treated with estrogens and progesterone. *Odontol Revy* 1973;24:49-58.

gestational diabetes is not completely understood, — studies show that periodontal treatment reduces circulating TNF- $\alpha$  and serum levels of glycosylated hemoglobin that help regulate metabolism. <sup>8</sup>

### In Sum

The precise link between periodontal disease and development of gestational diabetes is not fully understood. However, research suggests that when periodontitis does exist, it may increase the risk factors of diabetes for both mother and child:

- Nearly one out of two women with gestational diabetes also has periodontal disease. In contrast, just over one in 10 pregnant women without gestational diabetes has periodontal disease.

### Did you know?

**Gestational diabetes affects the mother in late pregnancy, after the baby's body has been formed, but while the baby is busy growing. Because of this, gestational diabetes does not cause the kinds of birth defects sometimes seen in babies whose mothers had diabetes before pregnancy. But it can cause macro-somia and predispose these children to diabetes mellitus themselves.**

- Pregnancy-induced gingivitis prevalence ranges from a low of 35% to a high of 100%, depending on the study.
- While the precise relationship between periodontal disease and gestational diabetes is not completely understood, — studies show that periodontal treatment reduces TNF- $\alpha$  and serum levels of glycosylated hemoglobin that help regulate metabolism.
- The presence of periodontal infection may increase the likelihood of pre-term, low-birth-weight children

diabetes or is at risk for developing gestational diabetes, you may reduce their risk factor significantly by including periodontal screening by a qualified dentist as part of their prenatal care.

1. Offenbacher S, Katz V, Fertik G, et al. Periodontal infection as a possible factor for preterm lo birth weight. J Periodontol 1996;67:1103-1113.
2. N. Pischon\*, N. Heng, J.-P. Bernimoulin, B.-M. Kleber, S.N. Willich<sup>1</sup>, and T. Pischon<sup>1,2</sup>: Obesity, Inflammation, and Periodontal Disease, 2007. J Pent Res 86 (5):400-409
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. Ibid.

**The point is this.** Whether your patient has existent

## What's Clicking? Preventive Oral Care Program Recommended by DentistryForDiabetics<sup>SM</sup>

By participating in a 12-month program that consists of rigorous oral care, coupled with 2 - 4 visits to a *DentistryForDiabetics* dentist, patients may maximize their ability to control glucose levels and prevent onset of gestational diabetes. Below is the oral care regimen recommended by the *DentistryForDiabetics* organization.

### Visit 1:

As part of a pre-pregnancy program, the first visit will consist of check up and treatment to address infection, inflammation or dental caries — to get the patient in the best possible state of oral and glycemic health.

### Visit 2:

The second dental visit should take place within two months after the patient learns she is pregnant. This visit will again test and treat signs of periodontal disease or dental caries – both of which may be

passed on to the baby.

### Visit 3:

This visit should take place late in the second trimester to provide check up and thorough treatment to ensure optimum health for both mother and child during the final trimester of pregnancy.

### Visit 4:

The fourth visit, which takes place postpartum, should be scheduled within eight weeks of baby's birth (for optimal health). The diabetically-aware dentist will treat any new issues, and may collaborate with the ob/gyn physician regarding changes in oral health and overall health.

From:

To: