



Exploring the Link between Oral Health and Systemic Health

Recent research from the lab of Dr. Marjorie Jeffcoat shows an antimicrobial mouth rinse regimen may cut the risk of preterm birth in women with periodontal disease.

The relationship between oral health and systemic health piqued the interest of Dr. Marjorie Jeffcoat, Professor, Department of Periodontics, from the very outset of her dental career, and it continues to be the focus of her Penn Dental Medicine laboratory today, with one of her most recent studies showing that the use of an alcohol-free, antimicrobial mouth rinse containing cetylpyridinium chloride (CPC) may be associated with a reduction in the incidence of preterm birth in pregnant women with periodontal disease. In the study, pregnant women with periodontal disease who adhered to an antimicrobial mouth rinse routine had significantly less incidence of preterm births (defined as less than 35 weeks) than members of the control group (5.6% vs. 21.9%, respectively).

This study and its findings were recently published in the October 2011 issue of the *American Journal of Obstetrics and Gynecology*. Dr. Jeffcoat conducted the research with Dr. Samuel Parry of the Department of Obstetrics and Gynecology in Penn's Perelman School of Medicine, and researchers at The Procter and Gamble Company, who had been studying the effects of chemotherapeutics on oral health and systemic outcomes. The study was funded by the Commonwealth of Pennsylvania and an educational grant and contract from Procter and Gamble.

"We are all excited by the potential public health implications of these initial findings," says Dr. Jeffcoat. "Within the high-risk population for preterm birth that we studied, sadly many of these patients don't have a dentist they see

regularly. Given the often limited access to dental care among at-risk groups, and the lingering concern of some patients and clinicians over the safety of dental therapy during pregnancy, our research suggests that the use of an alcohol-free mouth rinse could provide another more accessible and acceptable option for helping to control periodontal disease during pregnancy. Furthermore, such use may be associated with a reduction in the incidence of preterm birth."

"Our recent study may show early evidence of a role for topical oral antimicrobial therapy in controlling periodontal disease during pregnancy, and with it reduce the risk of preterm birth."

The controlled single-blind study looked at pregnant women at 6-20 weeks gestation who also had periodontal disease, refused mechanical dental care during pregnancy, and had no gynecological infections. A total of 226 subjects were included in the analysis, including 71 assigned to use the antimicrobial rinse and 155 untreated controls. Dental and obstetric examinations were performed at baseline with dental exams performed 3 and 6 months later to assess periodontal health. The subjects in the rinse group were

given an alcohol-free, .07% CPC rinse (Crest® Pro-Health®) and instructed to rinse for 30 seconds twice daily (with 20 ml of the supplied rinse) after brushing.

"For the health and well being of the mother and child, it was important to have an alcohol-free rinse," notes Dr. Jeffcoat, adding that the rinse also has a unique CPC time-release formulation that creates substantivity in the oral cavity.

The study's outcomes showed that along with the incidence of spontaneous preterm birth being significantly lower in the rinse group than the controls, the gestational age and birth weight were also significantly higher in the rinse group.

In periodontal outcomes, when comparing the mean number of bleeding sites and probing pocket depths per subject at baseline and six months later, both showed results in the rinse group indicative of an improvement in periodontal health.

Building on a Body of Work

Dr. Jeffcoat first perceived a correlation between women with untreated periodontitis and preterm birth while completing her dental training at Harvard in the late 1970s; as a periodontics resident in a hospital she provided dental care for women who were pregnant or who had recently given birth. Dr. Jeffcoat first presented work on the topic in 1984 and published a large study in 2001, and in recent years, there has been a growing body of research looking into this connection.

“We found that there is a correlation between the two, but we know that correlation isn’t always causation,” says Dr. Jeffcoat. “While the literature is mixed on whether treating periodontal disease works in preventing preterm birth, findings from previous work of our group suggest that indeed successful periodontal therapy [characterized by reduced inflammation, no increase in probing depth, and no loosening of the teeth] may be correlated with full-term birth after controlling for other factors.” The outcomes of that study, in which subjects received oral-hygiene instruction and scaling and root planing above and below the gum line, were published in January of this year in *BJOG: An International Journal of Obstetrics and Gynaecology* (Jeffcoat M, Parry S, Samuel M, Clothier B, Catlin A, Macones G. Periodontal infection and preterm birth: successful periodontal therapy reduces the risk of preterm birth *BJOG*. 2011 Jan;118(2):250-6. doi: 10.1111/j.1471-0528.2010.02713. Epub 2010 Sep 14.).

Dr. Jeffcoat notes that the differences in findings from the various studies in this area may be due to variations in the extent/style of periodontal treatment/cleaning provided and differences in the risk levels in the patient populations studied.

“It is important to select subjects that have periodontal disease to a level that would make it an issue,” explains Dr. Jeffcoat. “In the study we published in January, we actually did a mathematical formula to determine that and used it as well in selecting the patients for this rinse study.”

“While the results of our recent study may show early evidence of a role for topical oral antimicrobial therapy in controlling periodontal disease during pregnancy, and with it reduce the risk of preterm birth, further study is needed to confirm the results in this and other populations,” says Dr. Jeffcoat. Already she is taking up that task. With a generous

grant awarded this summer, she is beginning work on a follow-up study that will build upon the first. As a multicenter study in collaboration with the University of Alabama School of Dentistry, it will look at a much larger group of patients and include the capture and analysis of genetic data as well.

“Preterm birth is the major cause of perinatal mortality and morbidity worldwide and still difficult to predict and prevent,” adds Dr. Jeffcoat. “So, if something as simple as mouthwash could possibly help to change outcomes, that’s very exciting.” **PDJ**

—Beth Adams

CURRENT RESEARCH PROJECTS

With a common focus on the connection between oral health to systemic health, the current research projects within the lab of Dr. Marjorie Jeffcoat include studies related to preterm birth, diabetes, and osteoporosis as well as research training grants for students and junior faculty. Active projects include the following:

A Randomized Controlled Clinical Trial to Evaluate Late First- to Mid-Second Trimester Introduction of Advanced Daily Oral Hygiene on Pregnancy Gingivitis and Birth Outcomes: Oral Hygiene and Maternity Outcomes Multicenter Study — building upon the study of the role of an antimicrobial rinse to control periodontal disease during pregnancy and its possible impact on preterm birth.

A Clinical Study to Assess the Effects of an Oral Hygiene Regimen in Type II Diabetes with Gingivitis — looking at the impact of a combination of scaling and root planing and an antimicrobial rinse on lowering the hemoglobin A1c level in Type II Diabetes patients.

Actonel for the Maintenance of Bone in Adult Chronic Periodontitis — looking at what happens to bone around the teeth when on bisphosphonate drugs for osteoporosis.

Affect of Dental Treatment on Medical Costs: A Succinct Protocol — analyzing patient records from dental insurer United Concordia to assess the impact of periodontal treatment on medical costs, the number of doctor visits, and the number of hospital stays.

Building Clinical Research Capacity — supporting students and junior faculty who participate in the ongoing clinical research within Dr. Jeffcoat’s lab, it provides training in clinical research and adds to the capacity within the lab.