

Critical Issues in Dental Hygiene

Improving Oral Health Outcomes from Pregnancy through Infancy

Lori Rainchuso, RDH MS

Introduction

Oral health plays a crucial role in the overall health and well-being of a pregnant woman and her newborn child.¹⁻³ The 2000 Surgeon General's oral health report called for the elimination of oral health disparities. The report drew attention to the importance of changing attitudes and beliefs among health care providers, as well as in the community. In addition, the importance of oral health treatment during pregnancy is highlighted as an important strategy to potentially improve maternal and infant health.⁴

Pregnancy is not the time to defer dental examinations and necessary treatment. Dental care can be rendered safely throughout the pregnancy, though experts agree that due to first trimester morning sickness, and the third trimester level of comfort and risk of postural hypotension, the second trimester of the gestational period is most ideal.^{3,5,6} According to a study utilizing oral health data from the Centers for Disease Control Pregnancy Risk Assessment Monitoring System, many women do not receive dental care during their pregnancy.⁷ In addition, only half of the women who reported actually having a dental problem during their pregnancy were seen by a dental professional.⁷

Despite numerous research publications, professional guidelines and government reports regarding the importance of good oral health throughout pregnancy, health care professionals from both the medical and dental spheres continue to under-treat women during pregnancy.^{5,6,8} It

is recommended that all health care professionals who serve pregnant women provide the following: an oral health risk assessment, counseling of etiology and transmission of cariogenic bacteria to their newborns, referral to an oral health provider for a

Abstract

Purpose: The purpose of this paper is to provide an overview of current professional guidelines regarding oral health care through pregnancy and infancy stages, and to include risks associated with treatment, as well as health care providers' beliefs and attitudes surrounding treatment of these specific populations. Although dental treatment during the second trimester is ideal, there is no indication that preventive or restorative dental treatment during any trimester of pregnancy can cause harm to the mother or developing fetus. Despite these recommendations, routine dental care is often voluntarily avoided or postponed for the duration of pregnancy. Post-delivery, preventive oral care is typically postponed for a child until 3 years of age, years after the first tooth has erupted. While most health care professionals agree on the importance of good oral health in every stage of life, it is not being addressed. Whether it is based on misconceptions or lack of knowledge, health care providers are performing inadequate oral care for these patients.

Recommendations to increase health care during pregnancy and infancy should include improved advocacy of the established oral health care guidelines within each professional organization. In addition, curriculum revision should occur at the university level, to ensure future health care professionals will have a strong oral health foundation. Lastly, a collaborative effort needs to occur between all health care providers to better treat the patient's overall health, not only the specifics of one professional discipline. As health care professionals we are all responsible for the complete well-being of our patients, and an interdisciplinary approach will better ensure we accomplish this task.

Keywords: pregnancy, oral health, infant oral health, oral disease prevention, anticipatory guidance, dental home, interdisciplinary collaboration

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comprehensive examination and assistance in the establishment of a dental home for their infant.^{2,9} Early intervention and guidance during the perinatal period from all health care providers is imperative for the mother and infant.²

Current Health Care Perceptions

An Oregon study revealed that general practicing dentists' perceptions and perceived barriers had the strongest direct effect on their not providing care to patients during pregnancy. Of these barriers, the most significant were: perceived time, economic costs and dissatisfaction with reimbursement compensation.¹⁰ The greatest perceived barrier was indicated as economic cost: 72.9% of dentists indicated that compensation by insurance companies was inadequate for time spent counseling pregnant patients.¹⁰

The survey revealed that dentists in Oregon have a high level of incorrect knowledge about routine and emergency procedures concerning prenatal women. For restorative services, almost one third of dentists indicated they would not perform composite restorations at any stage of pregnancy. Approximately 50% indicated they would not perform composite restorations during a dental emergency. For nonsurgical periodontal treatment the survey revealed that 57% would not provide this service during the first trimester of pregnancy, 22% during the second trimester and 46% would not provide this service during the third trimester of pregnancy, and 69.2% would not provide this service during a dental emergency involving a severe periodontal abscess and infection. More than half of the dentists indicated they were reluctant to perform routine services during the pregnancy, and three-quarters were reluctant to perform services to relieve pain or swelling associated with a dental emergency. Despite the established perinatal guidelines attitude barriers remain, and negatively impact general dental practitioners' current practices.¹⁰ Although the research focused on the state of Oregon, this is expected to be a nationwide trend of practice.

Dental professionals are not the only ones responsible for the under-treatment of oral health care during pregnancy. Research shows that obstetrician-gynecologists (OBGYNs) have not been addressing the oral health needs or conducting oral health assessments for their pregnant patients. A national study, assessing how OBGYNs addressed oral health during pregnancy, showed 84% out of the 351 respondents agreed that routine dental care during pregnancy is important.¹¹ Those surveyed also thought periodontal disease could have adverse effects on pregnancy outcomes, however,

they seldom asked about the pregnant patient's current oral health, inquired about dental visits or provided oral health information. In addition, over a third of the respondents stated that they did not advise patients to see a dentist for routine dental care. The study also revealed that most do not discuss pre-planning methods for preventing dental caries in young children (95%, 91%).¹¹

The study asked basic oral health knowledge questions in which the majority (57%) acknowledged they were not qualified to recognize symptoms of periodontal disease, and that training in medical school and residency, on the screening and assessment of oral health issues, was non-existent or inadequate. Furthermore, most respondents stated they were not familiar with any oral health and pregnancy guideline publications.¹¹ In addition, the study showed that a majority of OBGYN physicians recognize the importance of good oral health during pregnancy, yet they do not address it. With improved advocacy and promotion of oral health education, OBGYNs may become more comfortable with assessing and addressing oral health with their pregnant patients.¹¹ By assimilating the current dental guidelines regarding oral care of the pregnant patient into an OBGYN standard of care practice, improvement of overall health for both mother and child could be achieved.

Oral Health Care Guidelines and Recommendations

Pregnancy commonly creates physical effects that may negatively impact routine oral self-care. Women frequently experience nausea which often leads to avoiding oral hygiene practices like tooth brushing, increasing the possibility for dental caries. In addition, women may be experiencing frequent vomiting, which compounds the risk of tooth erosion and dental caries.¹ To counteract the acidity of the oral cavity after vomiting, and reduce the risk of tooth erosion, it is recommended to swish with a teaspoon of baking soda dissolved in a cup of water, and to avoid brushing immediately after a vomiting occurrence.² Once the acid is neutralized, the teeth may be brushed using a soft-bristled toothbrush and fluoridated toothpaste.²

Furthermore, increased appetite and frequent snacking of cariogenic foods may also contribute to caries development. Pregnancy is an ideal time for dental professionals to conduct a dietary analysis. Patients should be educated on the importance of eating nutrient dense foods that promote oral health. Providers should include a discussion regarding the relationship of frequent snacking on simple carbohydrate foods, sweetened beverages

(including juices) and caries development.

Untreated dental caries in mothers increases the risk of caries development among their children, as maternal transmission and early childhood caries (ECC) has been established.^{5,12} The vertical transmission of *Streptococcus mutans*, from mother to child, has been well documented. Mothers with poor oral health and high levels of cariogenic bacteria are at a greater risk for infecting their children with the bacteria and increasing their children's caries risk at an early age.^{13,14} Therefore, decreasing the maternal cariogenic bacterial load is vital to the prevention or delaying of the infant developing ECC.^{3,5,12,15} The cariogenic bacteria is transferred by way of saliva exchange through various behaviors such as cleaning the infant's mouth with a saliva-moistened cloth, sharing of eating utensils or cleaning a dropped pacifier or teething toy via the parent's mouth.^{3,5,12,15} Oral health counseling during the perinatal stage can be beneficial in the prevention of ECC development.

Strategies that will decrease mother-to-child transmission of cariogenic bacteria include the treatment of the mother's present dental caries, improved oral self-care, dietary counseling, fluoride and xylitol. Xylitol supplementation has shown benefits in reducing maternal levels of cariogenic bacteria.^{3,5,16} Xylitol is a naturally occurring sugar alcohol that has been shown to lower *Mutans streptococci* levels in biofilm and saliva, resulting in reduced dental caries.¹⁷ Evidence suggests that the use of xylitol sweetened chewing gum (at least 2 to 3 times a day by the mother in dosages of 5 to 10 grams) has a significant impact on mother-child transmission of *Mutans streptococci* and decreasing the child's caries rate.^{14,17-20} One study showed that mothers who chewed xylitol gum (at least 2 to 3 times a day on average, starting at the sixth month of pregnancy, and continued for 13 months) had children significantly less likely to show *Mutans streptococci* colonization than the control group children ages 9 to 24 months. The children whose mothers did not chew xylitol gum acquired *Mutans streptococci* 8.8 months earlier than those whose mothers did chew the gum. The study suggested that maternal xylitol gum chewing may show beneficial effects to reducing transmission of cariogenic bacteria.²¹

Rendering of Dental Care during Pregnancy

Patient positioning modifications during the third trimester of pregnancy should be considered. Lying back in the dental chair can be uncomfortable in the final weeks of pregnancy. Due to the increased size of the uterus, it is advised to use a pillow or rolled

up towel, to elevate the right hip and displace the uterus to the left. Having the patient lean to their left side releases uterine pressure off the inferior vena cava, and promotes oxygenation. Semi-supine position may also be advised for patient comfort. These simple positioning modifications can prevent dizziness, nausea and supine hypotensive syndrome. In addition, dental appointments should be short in duration (Table I).^{2,5,13}

Guidelines for dental radiographs during pregnancy have been established. Recommendations advise that dental radiographs are safe throughout pregnancy, and that x-ray exposure for a diagnostic procedure does not cause harmful effects to the developing embryo or fetus.²² Dental professionals should follow the ALARA (As Low as Reasonably Achievable) principles to minimize the patient's exposure to radiation. The number and types of radiographs will depend upon the clinical conditions and patient's health history. As standard practice, precautions should be taken, therefore, protective aprons and neck shields should be worn.²³

Fluoride therapy during pregnancy can be advantageous in the strengthening of enamel and the prevention of dental caries. Professional fluoride varnish application for caries prevention has been endorsed by the American Dental Association.¹⁶ Since it has not been cleared for marketing by the U.S. Food and Drug Association for this purpose, it remains an "off-label" use of the product. There are many benefits to using fluoride varnish, such as time efficiency, patient acceptance and compliance over other professional fluoride methods.¹⁶ Additionally, pregnant women should be advised to use a fluoridated toothpaste and over-the-counter mouth rinse containing 0.05% sodium fluoride once a day or 0.02% sodium fluoride rinse twice a day for enamel remineralization and caries prevention.²

Routine prophylaxis and periodontal scaling and root planing may be provided during pregnancy. According to the American Academy of Periodontology, "For pregnant women, proper periodontal examination and treatment, if indicated, can have a beneficial effect on the health of their babies."²⁴ Furthermore, advanced periodontal treatment may be rendered safely, during the beginning of the second trimester. To ensure the health of both mother and child, the American Academy of Periodontology urges for the prompt treatment of acute periodontal infections during any stage of pregnancy.²⁴

Professional guidelines regarding pregnancy advocate for continuation of restorative care.^{3,5,6} Restorative therapy to remove carious lesions to improve the mother's oral health and reduce the

cariogenic bacterial load can occur during pregnancy.^{5,6,9} Short term exposure of dental composite restorations and sealants suggests no health risks. Furthermore, amalgam placement has been reaffirmed as safe, when best practices are utilized.^{25,26} There is no significant data for long term usage of these dental treatments.⁵

A study reporting the associations between adverse pregnancy outcomes and essential dental treatment did not significantly increase the risk of any adverse outcomes to mother or fetus. The research included both temporary and permanent restorations, endodontic therapy and extractions.⁶ In addition, dental professionals administered local anesthesia as deemed appropriate during treatment. The study was conducted during the gestational period of 13 to 21 weeks.⁶

Infant Oral Health

Dental care during pregnancy includes educating the mother about the importance of infant oral health. An infant should receive a dental exam at age 6 months, or by the eruption of the first primary tooth. Parents should establish a dental home for infants by 12 months of age. Early establishment of a dental home is crucial in ECC prevention and intervention.^{3,5,9,14,27}

Anticipatory guidance helps a parent learn what to expect during their infant's present and future developmental stages. Oral health preventive counseling should include oral hygiene, fluoride exposure, nutrition and diet, nonnutritive oral habits (such as pacifier use and thumb sucking), dental trauma, and injury avoidance.^{2,9} Best practice brushing technique involves lifting the lip away to expose the cervical one-third portion of the anterior teeth. This technique has a 2-fold purpose, to effectively brush at the gumline and examine for early carious lesions. Parents should be advised to brush their child's teeth twice daily, using a smear layer of fluoridated toothpaste on a child size toothbrush is advised for an infant of moderate to high caries risk, and a pea-sized amount of fluoridated toothpaste for children older than 2 years of age. Parental brushing from infancy, as well as supervised brushing up to 8 years of age, is recommended for effective removal of biofilm, and to prevent excessive intake of fluoridated toothpaste.⁵ All necessary precautions should be taken during tooth develop-

ment to prevent fluorosis.¹⁶ Lastly, dietary education includes the discussion of the cariogenicity of certain foods and beverages, the consequence from frequent consumption of sugary beverages and foods, and the demineralization process. The dental team should discourage parents putting their infant to bed with a bottle containing anything other than water, after the first tooth eruption.^{9,14}

Conclusion

When rendering best practices, dental professionals may safely treat women during pregnancy. Pregnancy is not a time to postpone preventive or therapeutic dental care. Pregnancy can be an opportunistic time when women may be more receptive to oral health information and treatment, and for women of low-socioeconomic status, may be the only time they are eligible to receive dental care coverage.^{8,15,18,21,28} Oral health promotion during pregnancy will ensure both improved oral health for the mother, and encourage a healthier future for the oral cavity of the child. In order for optimal care during pregnancy and infancy to occur, the future health care model must involve interdisciplinary collaboration.

Oral health care during pregnancy should be a shared responsibility among the prenatal professional, patient and dental team. To increase oral health access to these specific populations, the following must occur: OBGYNs informing patients of the importance of oral health and disease prevention during pregnancy, increasing patients' knowledge base to enable self-advocacy and educating dental professionals about the importance of treating patients during pregnancy and infancy. The dental community must promote an awareness of oral health being an essential part of overall care, and discourage the belief of oral health as a form of supplemental care. Improving the communication of health care disciplines, as well as, encouraging medical-dental student collaboration and interdisciplinary scholarship among health professionals, will ultimately provide mutual patients with better overall health care and well-being.

Lori Rainchuso, RDH MS, is an assistant professor and Interim graduate program director, Forsyth School of Dental Hygiene, MCPHS University in Boston.

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