

Dental Consideration in Pregnancy: A Review

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Abstract

Pregnancy and oral health are surely a topic that needs to be paid attention. Physiologic changes of pregnancy influence the dental management of women during pregnancy. Understanding these normal changes is essential for providing quality care for pregnant women. Oral health care is an essential component of overall health, and it is important to maintain good oral health during pregnancy because it has the potential to reduce the transmission of pathogenic bacteria from mother to their children. The article reflects the different systemic changes seen in pregnant women and how these changes are to be considered for dental treatments.

Keywords: Dental treatment, Medication, Pregnancy

INTRODUCTION

Pregnancy is a unique period in a women's lifetime. Physiological changes due to the interaction of hormones in pregnancy causes several systemic and local physical changes. These physiological changes influence the dental management of women during pregnancy. The pregnant women who present for dental care requires special consideration. The management of these patients may require alteration in the timing and type of dental treatment as well as modification of the drugs to be prescribed. In some pregnant women, gingivitis is aggravated (pregnancy gingivitis) or may even result in a pyogenic granuloma at the gingival margin (pregnancy epulis). These conditions typically arise after the second month and resolve on parturition. Pericoronitis and third molar impaction should be given special attention. Advanced restorative procedures are probably best postponed until the periodontal status improves after parturition. Dental treatment is best carried out during the second trimester. All elective dental procedure should be postponed until postpartum. Dental radiographs should also be kept to a minimum

with appropriate patient shielding and collimation and if possible should be best avoided. All surgical procedures should be done only after consultation with the patient's gynecologists. Dental practitioners need to determine that the potential benefits of the drug required for the mother's dental care outweigh the risk of the fetus.

PHYSIOLOGIC CHANGES ASSOCIATED WITH PREGNANCY

Cardiovascular system undergoes tremendous changes during pregnancy. There is an increase in Blood volume and cardiac output due to increasing in demand by the fetus. Cardiac output increases in the first trimester, plateaus in the second trimester and has a minimal increase in the third trimester. During the second and third trimester, a decrease in blood pressure and cardiac output can occur while the patient is in the supine position. This has been due to the decreased venous return to the heart due to the compression of the inferior vena cava by the gravid uterus, which can result in 14% reduction of cardiac output. The condition is known as supine hypotensive syndrome and is manifested by light-headedness, hypotension, tachycardia, and syncope. Placing the patient in a 5-15% tilt, on her left side can relieve supine hypotension. If hypotension is still not relieved, a full left lateral position may be needed.¹

Maternal plasma volume and red blood cell changes account for a substantial increase in overall blood volume.

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The relative increase of plasma volume over red blood cell mass shows up as hemodilution or physiologic anemia of pregnancy, which reaches its maximum by 30-32 weeks of gestation.²

Significant hematological changes include an increase in red blood cells, white blood cells, erythrocyte sedimentation rate, and all coagulation factor, except Factor XI and XIII, and a decrease in hemoglobin content of the blood.³

Increased circulatory catecholamines and cortisol lead to leukocytosis. Thrombin mediated fibrin generation increases during pregnancy which combined with the increased amount of clotting factor and increased hematocrit, leads to hypercoagulable state of pregnancy.⁴ All these factor, along with surgery, point to the clinically important predisposition of deep venous thrombosis and pulmonary edema.⁵

The entire respiratory tract becomes edematous due to capillary engorgement.⁵ There is also engorgement of nasal capillary and rhinitis in 30% of pregnant women that leads to nose bleed and predisposes the pregnant women to various upper respiratory infections.^{1,6,7} Rhinitis of the pregnancy begins at the beginning of the second trimester and increases in severity until delivery, when it often resolve within 48 h.¹

Mechanical changes resulting from enlarging fetus, in combination with hormonal changes, are responsible for the alteration in GI system. Nausea and vomiting occur in about 66% of pregnant women beginning approximately 5 weeks after the last menstrual period and peaking between 8 and 12 weeks. Also pyrosis (heartburn) occurs in approximately 30-50% of pregnant women.⁶

For pregnant women with hyperemesis gravidarum requiring dental treatment, morning appointments should be avoided, and they should be advised to avoid citrus drinks or fatty food as they may cause gastric upset or delay gastric emptying.^{6,8} During dental procedure, a pregnant patient should be seated in a semi-supine or comfortable position. In the case of vomiting, procedure should be stopped immediately, and the patient should be repositioned upright. When vomiting is over, rinsing the mouth with cold water or a mouthwash is recommended.⁶

During pregnancy, there is an increased demand for energy to enable the placenta to grow. This demand affects the metabolism of all the nutrients. The most important nutrient deficiency affecting the fetus profoundly is iron and folic acid. Iron is required for fetal erythropoiesis and folic acid for amino acid and nucleic acid synthesis. Therefore, additional supplements are required.

There is an increase in renal plasma flow by about 50-80% and glomerular filtration rate by 50%. The increase in the renal plasma flow is due to a generalized increase in blood volume, there is also increased the frequency of urination usually during the second half of the gestation due to altered osmoregulation. It is advisable to ask the patients to void the bladder just prior to starting the dental procedure.⁶

Estrogen, progesterone, human gonadotrophin are the female sex hormone and are secreted by placenta. These hormones are responsible for the various physiologic changes occurring during pregnancy. Along with these hormones thyroxin, steroids and insulin level also increases. Women who have a positive family history of diabetes mellitus Type 2 are at high risk of developing gestational diabetes, due to increasing in insulin resistance during pregnancy. Hence, one should perform the test to check the blood sugar level before carrying out any dental procedure.⁷

DRUGS USED IN PREGNANCY

The goal of any drug therapy prescribed during pregnancy is to avoid adverse drug reactions in either the mother or the fetus.⁹

Caution should be exercised when prescribing drugs to a pregnant woman. Certain drugs are known to cause miscarriage, teratogenicity, and low birth rate because most drugs cross the placenta by simple diffusion.⁵ Drugs are absorbed easily during pregnancy as the serum concentration for drug binding is lower than in the non-pregnant state.⁶

Clinicians should always strive to select the medication with the most reassuring and extensive data available. The US FDA has categorized the potential for drugs to cause birth defects, providing definitive guidelines for prescribing drugs during pregnancy (Table 1). They are as follows:⁶

- Category A: Controlled human studies indicate no apparent risk to the fetus. Possibility of risk to the fetus is remote.
- Category B: Animal studies do not indicate fetal risk. Well-controlled human studies have failed to demonstrate a risk.
- Category C: Animal studies show an adverse effect on the fetus, but there are no controlled studies in humans. The benefits from the use of such drugs may be acceptable.
- Category D: Evidence of human risk, but in certain circumstances the use of such a drug may be acceptable in pregnant women despite its potential risk.

Table 1: Drugs used in the pregnant or lactating dental patient^[5]

Drug	FDA category	Use in pregnancy	Use while breast-feeding
Local anesthetics: Injectable			
Articaine	C	Yes	Yes
Bupivacaine	B	Yes	Yes
Lidocaine	B	Yes	Yes
Mepivacaine	C	Yes	Yes
Prilocaine	B	Yes	Yes
Local anesthetics: Topical			
Benzocaine	C	Yes	Yes
Dyclonine	C	Yes	Yes
Lidocaine	B	Yes	Yes
Tetracaine	C	Yes	Yes
Analgesics			
Acetaminophen	B	Yes	Yes
Aspirin	C/D*	Do not use in 3 rd trimester	Use cautiously
Diflunisal	C/D*	Do not use in 3 rd trimester	Use cautiously
Etodolac	B/D*	Do not use in 3 rd trimester	Yes
Flurbiprofen	B/D*	Do not use in 3 rd trimester	Yes
Ibuprofen	B/D*	Do not use in 3 rd trimester	Yes
Ketorolac	B/D*	Do not use in 3 rd trimester	Yes
Ketoprofen	B/D*	Do not use in 3 rd trimester	Yes
Naproxen	B/D*	Do not use in 3 rd trimester	Yes
Codeine	C	Low dose, short duration acceptable	Yes
Oxycodone	B	Low dose, short duration acceptable	Yes
Meperidine	B	Low dose, short duration acceptable	Use cautiously
Propoxyphene	C	Low dose, short duration acceptable	Use cautiously
Antimicrobials			
Penicillin	B	Yes	Yes
Amoxicillin	B	Yes	Yes
Amoxicillin+clavulonic acid	B	Yes	Yes
Cloxacillin	B	Yes	Yes
Cephalosporins	B	Yes	Yes
Erythromycins	B	Yes (do not use estolate)	Yes
Clindamycin	B	Yes	Yes
Clarithromycin	C	Use cautiously	Yes
Azithromycin	B	Yes	Yes
Tetracycline	D	No	Yes
Doxycycline	D	No	No
Metronidazole	B	Use cautiously	Use cautiously
Nystatin	B	Yes	Yes
Ketoconazole	C	Use cautiously	No
Fluconazole	C	Use cautiously	No
Chlorhexidine rinse	B	Yes	Yes

Category X: Risk of use in pregnant women clearly outweighs possible benefits.

Drugs Commonly Used in Dentistry

Analgesics: Acetaminophen, FDA category B, is the most useful analgesic to be used during pregnancy. It can be used in any stage of pregnancy and in nursing mothers.⁶ The absorption and disposition of the acetaminophen in normal doses are not altered by pregnancy; the drug does not prolong bleeding time, unlike aspirin and is nontoxic to the newborn.⁵ Aspirin is a prostaglandin inhibitor and is known to cause constriction of the ductus arteriosus. It is also secreted in breast milk. Therefore, it should be avoided particularly during the third trimester of pregnancy and while nursing.⁶ NSAIDs are also prostaglandin synthesis inhibitors and are also excreted in small amounts into the

breast milk⁶ NSAIDs may prolong pregnancy. Therefore, aspirin and NSAIDs should be avoided, particularly during the third trimester of pregnancy.⁹

Antibiotics: Beta-lactam ring derived antibiotics (penicillins and cephalosporins) are the first-choice antibiotics for orofacial infections. They are categorized as FDA class B drugs. These antibiotics cross the placenta but are known to be safe when used in pregnancy.¹⁰ Clindamycin, erythromycin and metronidazole also appear to be safe, with the exception of the estolate form of erythromycin, which may produce cholestatic hepatitis.⁵ Chlorhexidine is categorized as a class B drug by the FDA and is safe to use during pregnancy. Xylitol and chlorhexidine reduces maternal oral bacterial load and reduces the vertical transmission of bacteria to infants when used late in

pregnancy. Both topical agents are safe in pregnancy and during breastfeeding.¹¹

Local anesthesia: Most local anesthetics used in dentistry are FDA class B, except mepivacaine and bupivacaine, which are FDA class C.⁹ All local anesthetics used in dentistry can cross the placental barrier, primarily through passive diffusion. In general, there are no contraindications to the careful use of lidocaine with epinephrine or prilocaine in pregnant patients.¹² Even in doses exceeding the maximum allowed in humans, both lidocaine and prilocaine showed no evidence of fetal harm.¹² The local anesthetics and vasoconstrictors used in dentistry are safe to administer to a pregnant patient, provided that aspiration is performed to minimize the risk of intravascular injection.⁵

Antifungal drugs: Nystatin and clotrimazole are FDA class B drugs, and they are considered to be safe during pregnancy and lactation.¹³

Steroids: Corticosteroids are commonly used to reduce inflammation. When used locally they are safe but its systemic use can harm the mother and the fetus and thus should be avoided during pregnancy.⁷

Sedative and anxiolytics: Few anxiolytics are safe during pregnancy; however, if one needs to be used then nitric oxide is the safest choice if used in second or third trimester for >30 min while delivering 50% oxygen throughout procedure.¹⁴

CONCLUSION

Pregnancy is a unique period with various physiologic changes that support the formation and maturation of new life. The dental care professionals must gain a basic understanding of the underlying physiologic changes of

pregnancy, the influences which are related to the use of medication during gestation, and how these may interact with the delivery of dental care.¹⁵

When prescribing drugs to the pregnant dental patients, the dentist must weigh the balance between risk to the fetus and benefit to the mother. A trusting, open relationship between the dentist and patient is of vital importance to optimize the mother's treatment during pregnancy.

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How to cite this article: Prajapati VK, Das AK. Dental Consideration in Pregnancy: A Review. *Int J Sci Stud* 2014;2(8):191-194.

Source of Support: Nil, **Conflict of Interest:** None declared.