Review Article

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SPECIAL CONSIDERATIONS IN THE DENTAL CARE OF PREGNANT PATIENTS

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ABSTRACT:

Background: During pregnancy many physiological changes take place some of which are especially relevant to dentistry. As such, there being two patients involved, dental treatment during the perinatal period could be fraught with potential dangers unless adequate precautions are taken.

Methods: Accordingly, a few journals and standard text books/reference books were selected and screened to glean information that dealt with the oral & systemic aspects of treating gravid patients. Most of these sources were fairly recent so as to know current opinions on the issue.

Results: A few important guidelines have been compiled for dentists to keep in mind while treating pregnant women which are as follows: Maintenance of oral hygiene by the mother is important as is prompt professional care to prevent and intercept infection. Appropriate triage, avoidance of all-but-essential radiographs and use of minimal medication are factors that must be kept in mind. Medications such as Tetracyclines, Quinolones, Benzodiazepines and many commonly prescribed Analgesics are potentially harmful and should be avoided by pregnant women and nursing mothers as these are associated with potential harm to the baby. Penicillins, Acetaminophen and some Local anesthetics have been found to have a fairly safe track record.

Clinical Implications: Clinicians must enquire about the status of all women of childbearing age and treat them cautiously. Prescription of time-tested medications is to be preferred. When in doubt, consultation with the patient's obstetrician /physician is to be highly recommended.

Keywords: pregnant, dental, considerations

INTRODUCTION:

Pregnancy is a distinctive phase in the life of a woman wherein she undergoes anatomical, physiological and hormonal changes; some of these changes and their impact on dental treatment planning are briefly outlined below:

Oral and Periodontal changes: Gingival fluid, pocket depth & tooth mobility are increased due to the influence of female sex hormones on the periodontium. Although pregnancy itself does not cause gingivitis, the increase in levels of estrogen and progesterone help depress the immune response and compromise the local defense mechanism accentuating the severity of the gingival response to plaque in 60-75% of pregnant women.[1]

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The oral and periodontal changes have been attributed to a wide range of factors including alterations in hormone levels, microbial patterns, cellular metabolism & immune response.[2]

The inflamed gingiva may show generalized enlargement with dark red to bluish red color, edema and ease of bleeding. Alternately, discrete tumor-like masses (pregnancy-associated pyogenic granuloma) may occur usually during 2nd or 3rd trimester in less than 10% of all pregnancies.[3] These growths are excised surgically if they are painful, continue to bleed, interfere with mastication or if specifically requested for cosmetic reasons.

Nausea, vomiting and hypersensitive gag reflex may complicate upto 70% of pregnancies .If regurgitation or vomiting occurs frequently it may cause dental erosion, so a rinse with baking soda in water is recommended to neutralize the acid.In case of morning sickness, scheduling afternoon appointments may help.

The importance of thorough self-care for plaque biofilm control should be stressed to pregnant women.[4] Neglect of oral hygiene may contribute to increased caries especially if the mother develops a capricious desire for sweets.

Patients are encouraged to maintain a balanced nutritious diet, limiting refined carbohydrates and carbonated soft drinks. Use of alcohol and tobacco is actively discouraged. Xylitol –containing gum may help to minimize the bacterial load.

Potential Systemic Concerns: Anemia may result from increased fetal demands: iron and foliate supplements are indicated. The White blood count increases progressively almost doubling at term.[5]

Poor periodontal health of the mother may be an important risk factor for pre-term low birth weight babies, which is a major public health problem.[6] Antenatal screening & intervention may be necessary.

Pregnant patients are advised to use alcohol-free products when choosing over the counter antimicrobials such as chlorhexidine or cetylpyridinium chloride mouth rinse. Even modest amounts of alcohol during the first 7 weeks of gestation (when the woman may yet be unaware she has conceived) can cause Fetal alcohol syndrome (short palpebral fissures, flat midface, indistinct philtrum, thin upper lip, microdontia, etc.).[7] The prevalence of congenital abnormalities in the children of alcoholic mothers has been estimated at 32%.

In pregnancy the levels of circulating coagulation factors are increased. So patients at high risk for thrombo-embolic events are often placed on heparin therapy; to prevent hemorrhage during treatments the dental surgeon may require to consult her prenatal caregiver. [1]

Epilepsy, hypothyroidism, pulmonary or cardiac disease and bleeding disorders may complicate pregnancy necessitating double caution. Other situations where Obstetric/physician consultation should be

sought include: a history of premature labor, threat of spontaneous abortion, pregnancy-induced hypertension, gestational diabetes, need for intravenous sedation/general anesthesia/nitrous oxide.[1]

Treatment Concern: In the first trimester organogenesis takes place. Hence radiographs, MRI and non-essential medications are avoided as far as possible. Non-emergent dental procedures are preferably delayed.

Pain and infection should be treated immediately- fetal risk is greater if treatment is postponed. Abscesses are drained and the offending pulp extirpated where indicated. Alternately, uncomplicated extractions are done for control of infection.

Sudden changes in dental chair position from reclining to upright should be avoided as pregnant patients are susceptible to postural hypotension. In fact, it may be preferable to keep the chair upright to relieve abdominal pressure for patient comfort.[8]

The second trimester is safest for treatment. [9] It is also traditionally considered more comfortable because nausea and postural issues are not much of a problem.

Hypoglycemia and resultant syncope can be prevented by recommending a snack containing proteins and complex carbohydrates just prior to the appointment .The patient should drink sufficient water and chair-side time should be kept at minimum.[8] A restroom break may be anticipated.

Only absolutely essential radiographs should be taken. Lead shield, thyroid collar, proper collimation, filtration, high-speed film/digital imaging and other precautions are strictly adhered to. In fact lead-shield and thyroid collar should be used routinely for all women of child-bearing age, so as to preclude the possibility of developmental defects.

Preventive measures such as removal of local irritants early in pregnancy are advocated. Regular follow-up is emphasized to the mother. If the dentist or auxiliary has an infectious disease, gravid women are not scheduled during the recovery phase.

During the late third trimester the mother is increasingly less comfortable (with muscle cramps, back pain, etc.)In 15-20% of term pregnant women, in the supine position the pressure of the gravid uterus may compress the inferior vena cava. This blocks the venous return and the patient develops decreased blood pressure, decreased cardiac output and eventual loss of consciousness. Therefore use of the sitting position or elevation of the right hip 5 to 6 inches with pillows or a rolled towel is recommended. [10]

Elective dental care is usually avoided in the last month of pregnancy due to increasing fatigue and patient discomfort. Premature labor may also be ascribed to dental treatment, though without adequate justification.[9]

Drug Concerns: Physiological changes such as increased renal clearance may necessitate greater doses of some drugs to achieve optimal therapeutic blood level [11]. It is prudent to confer with the patient's physician before prescribing any medication other than a local anesthetic. [12] Obstetricians generally wish to be consulted before a dentist prescribes antibiotics/analgesics.

The greatest risk from exposure to drugs occurs before the pregnancy status is known.13. Hence caution may be prudent in all women of childbearing age (age 11 upwards till menopause).

In treating the gravid patient one must note that there are two persons involved. Medications are kept to an absolute minimum due to the potential for teratogenicity. Clinicians would remember the 1960s when 10,000 malformed babies were born after use of Thalidomide as a sedative by the mother [14];as little as a single dose taken as prescribed had caused *phocomelia* (seal limb deformities) in the fetus. This should serve as a caution.

Patients must be informed about the risk of possible teratogenicity or other adverse effects with currently used drugs. The US Food and Drug Administration have given each drug a category based on its known potential for risk.[15]

CATEGORY

Category A: Well-controlled studies in humans have failed to demonstrate a risk to the fetus and possibility of fetal harm seems remote.

Category B: Animal studies have not indicated fetal risk and human studies have not been conducted. Or animal studies have shown a risk but controlled human studies have not.

Category C: Animal studies have shown a risk, but controlled human studies have not been conducted; or studies are not available in humans or animals.

Category D: Positive evidence of human fetal risk exists but in certain situations the drug may be used despite the risk considering the benefits of therapy.

Category X: Evidence of fetal abnormalities and fetal risk exists based on human experience and the risk outweighs any possible benefit of use during pregnancy.

The safety profile of some common drugs is listed in the adjoining Table. The merits/demerits of their use in pregnancy are discussed below:

Antimicrobials

It is well established that Tetracycline's (FDA Category D) cross the placenta and chelate with calcium orthophosphate producing yellow to brown discoloration of teeth as also growth impairment of bones.[16] The resultant hypo-plastic enamel matrix may also predispose to dental caries.

The period of greatest danger to the teeth is from mid-pregnancy to about 4th-6th month of post-natal period for the deciduous anterior teeth; and from a few

months to 5 years of age for the permanent anterior teeth when the crowns are being formed. [17]

The Quinolones (e.g.: Ciprofloxacin- FDA category C) may damage growing cartilage 19. They are to be avoided. Metronidazole (FDA category B) has been used with no apparent side- effects; however it is best excluded during the first trimester.[18]

Penicillins (including Amoxicillin) as well as first- and- second generation Cephalosporins (FDA category B) are considered safe as they have a good track record.[1] Cephalexin is not secreted in milk and is therefore given to mothers' breastfeeding their children.

Erythromycin (FDA category B) is safe excepting the 'estolate' form which causes maternal hepatotoxicity.[13] Azithromycin (FDA category B) has a convenient once- a-day dosing but should be used with caution in nursing mothers. [20]

Chlorhexidine gluconate, a Category B antimicrobial mouth rinse is recommended for use by gravid patients. As a rule, one must remember that the danger of bacteremia and septicemia are far greater to the fetus than the danger of the antibiotic crossing the placenta. [21]

Analgesics

Long-term use of Analgesics is inappropriate. The lowest required dose for the shortest duration possible to control pain is advised.

NSAIDs in general are discouraged during pregnancy. Aspirin and diflunisal may cause prolonged labor;Anemia, bleeding potential and premature closure of fetal ductus arteriosus are also possible adverse outcomes .[22]

Ibuprofen, ketoprofen and naproxen are FDA category B for the 2nd trimester. They are not recommended in the 3rd trimester due to the risk of hemorrhage during delivery and constriction of fetal ductus arteriosus.[13]

Indomethacin and sulindac have caused developmental malformations.

Opioids/narcotic analgesics in excess can produce neonatal depression of CNS so they are not preferred.[22] Besides, prolonged use can cause addiction in the fetus and growth retardation.

Paracetamol/ Acetaminophen is probably the safest (FDA rating B) and is widely prescribed or self-administered in all stages of pregnancy [23]. However patients should be made aware that various strengths and preparations are available, some of which are contraindicated in children (eg.Crocin Advance).This caution would apply to pregnant patients too.

Also the maximum daily dose of 4 gm. / day should strictly be adhered to lest liver and renal toxicity result. Frequent use of Paracetamol, especially in late pregnancy may be associated with an increased risk of persistent wheezing in infants.[24]

Anesthesia/ Sedation: Control of anxiety is probably best achieved by counseling and verbal sedation. Local rather than general anesthesia is preferred .Lidocaine should be the first choice unless there is a contra-

indication such as allergy. Epinephrine/ adrenaline in the amounts used with local anesthetics is considered safe [5] if limited to the minimal dose required and administered by proper aspiration technique.

Benzodiazepines are contraindicated because of the risk of oral cleft development (in first trimester) as well as neonatal toxicity and withdrawal symptoms during the third trimester.[22]

Antifungals: Nystatin (FDA rating B) is safe to treat oral candida infections.13. Fluconazole, like Ketoconazole, is category C. All azole agents are best avoided during pregnancy.[25]

Amalgam/Composite Restorations: There is no evidence of any harmful effects in pregnancy when standard safe amalgam practices are used.[1] For composite resins, short –term exposure may not pose a health risk; however data are lacking on the effects of long-term exposure. To minimize risk, immediate rinsing of cured surfaces to remove the un-polymerized layer is recommended.

Fluoride- (Category C) If deemed necessary to treat sensitivity and prevent caries, fluoride varnish may be preferred over topical fluoride gel as the latter is known to cause nausea.

Herbal medications: Since herbal medications are gaining in popularity, information regarding the use of such supplements should be obtained. For instance, even high doses of Garlic may increase the risk of heavy bleeding by its' platelet-aggregating properties.

Postpartum, drugs are preferably to be administered just after breast-feeding; and lactation is avoided if possible for the next 4 hours so as to prevent transmission of drugs to the infant in breast-milk .[5]

CONCLUSION:

The pregnant patient poses a special challenge to the dentist. Maintaining meticulous oral health is important. The health of both mother and baby are to be considered during treatment planning. The second trimester is preferred. Only absolutely essential radiographs are taken and that with proper precautions. Drug prescription is kept to the bare minimum. Penicillins, Cephalosporins and Acetaminophen are relatively harmless whereas Tetracyclines, Quinolones and Benzodiazepines are contra-indicated. When in doubt, close consultation with the obstetrician/physician is recommended.

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TABLES:

SOME COMMON DRUGS AND THEIR USE DURING PREGNANCY AND LACTATION

Serial No.	Drug	FDA Pregnancy Risk Category	Use in Pregnancy	Use during Breast-feeding	Potential Adverse effect
	Antimicrobials				
1	Penicillin's Amoxicillin Augmentin	B	Yes Yes Yes	Yes Yes Yes	Infant may be sensitized. Diarrhea in infant.
2	Cephalosporin's 1st & 2nd generation	B	Yes	Yes	Limited information
3	Erythromycin Azithromycin	B	Yes(avoid estolate) Yes	Yes (avoid estolate) Caution	Intra-hepatic jaundice in the mother
4	Tetracycline's Doxycycline	D	Never use during Pregnancy	Not recommended	Dental Hypoplasia and staining. Bone growth depressed
5	Fluoro-quinolones Ciprofloxacin Ofloxacin Norfloxacin	C	Not recommended	Not recommended	Damage to growing cartilage. Arthroplasty.
6	Metronidazole	B	Notrecommended in 1st trimester	Consult physician	May be Mutagenic. Carcinogenic in animals
	Local Anesthetics				
7	Lidocaine	B	Yes	Yes	
8	Prilocaine Etidocaine	B	Yes	Yes	
9	Bupivacaine Mepivacaine	C	Consult obstetrician	Consult obstetrician	Embryocidal in rabbits Fetal bradycardia
10	Vasoconstrictor Epinephrine	C	Yes	Yes	Limit to cardiac dose-else hypoxia
	Sedative/Hypnotics				
11	Benzodiazepines Diazepam Alprazolam Lorazepam	D	Not recommended	Not recommended	Possible risk for oral clefts with prolonged exposure
12	Triazolam	X	No	No	
13	Barbiturates	D	Not recommended	Not recommended	Neonatal dependence

14	Nitrous Oxide (with Oxygen	Not assigned	Consult obstetrician	Yes	Avoid in first trimester

	Antifungals				
15	Nystatin Amphotericin B	B/ C	Yes	Yes	
16	Fluconazole	?	Consult Obstetrician	Consult Obstetrician	
17	Corticosteroids Prednisone	B	Yes	Yes	
	Antivirals				
18	Acyclovir	C	No	No	Limited experience; concentrated in milk
19	Penciclovir Famciclovir	B	Probably	Consult Obstetrician	Inadequate information

	Analgesics				
20	Aspirin	C/D	Not recommended in 1st & 3rd trimester. Maximum 48-72 hrs.	Not recommended	Post-partum bleeding, premature closure of fetal ductus arteriosus
21	Ibuprofen Flurbiprofen Naproxen	B/D	Not recommended in 1st & 3rd trimester	Consult obstetrician	Delayed labor, affects fetal ductus arteriosus
22	Opioids Codeine Hydrocodone Oxycodone	B/C	Use with caution; Low dose & Short duration	Yes	Neonatal respiratory depression; addiction in fetus if prolonged use
23	Acetaminophen	B	Yes –but avoid overdose, check preparation	Yes	Teratogenic at overdose levels