بسم الله الرحمن الرحيم

Dental Management Considerations for Pregnant Patients

Dr. K. Katebi

August
2021

Drug Administration

- Drug administration in the treatment of pregnant dental patients is very controversial.
- The principal concern is that a drug may cross the placenta and be toxic or teratogenic to the fetus.
- Additionally, any drug that is a respiratory depressant may cause maternal hypoxia, resulting in fetal hypoxia, injury, or death.

Drug Administration

- Ideally, drug administration should be avoided during pregnancy, especially during the first trimester.

- However, adhering to this rule is sometimes impossible.

- Actually, 75% of pregnant women s are taking some type of medication.

Drug Administration

- Fortunately, most of the commonly used drugs in dental practice can be given during pregnancy with relative safety, although a few exceptions are notable.
- Before prescribing or administering a drug to a pregnant patient, the dentist should be familiar with categorization of prescription drugs for pregnancy based on their potential risk of fetal injury.
- These pregnancy risk classification categories, although not without limitations, are meant to aid clinicians and patients in making decisions about drug therapy.
- Counseling should be provided to ensure that women who are pregnant clearly understand the nature and magnitude of the risk associated with a drug.

The current five pregnancy labeling categories are as follows

- **A** Controlled studies in humans have failed to demonstrate a risk to the fetus, and the possibility of fetal harm appears remote.
- **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.
- **C** Animal studies have shown a risk, but controlled human studies have not been conducted, or studies are not available in humans or animals.
- **D** Positive evidence of human fetal risk exists, but in certain situations, the drug may be used despite its risk.
- **X** Evidence of fetal abnormalities and fetal risk exists based on human experience, and the risk outweighs any possible benefit of use during pregnancy.

Categories

- Drugs in categories A or B are preferable for prescribing during pregnancy.
- However, many commonly prescribed drugs used in dentistry fall into category C, and thus the safety of their use is often uncertain.
- Drugs in category C present the greatest difficulty for the dentist and the physician in terms of therapeutic and medicolegal decisions, and therefore, consultation with the physician may be needed

Controversies

- Physicians may advise against the use of some of the approved drugs or conversely may suggest the use of an uncertain or questionable drug.
- The FDA categories are general guidelines and may be incomplete, and therefore, differences in practice are not unusual.
- An example of the occasional use of a questionable drug would be a category C narcotic analgesic for a pregnant patient who is in severe pain.

Local Anesthetics

- Common local anesthetics (lidocaine, prilocaine) administered with epinephrine are generally considered safe for use during pregnancy.
- Articaine, bupivacaine, and mepivacaine are typically safe, although some caution should be exercised.

Local Anesthetics

- Both the local anesthetic and the vasoconstrictor cross the placenta, subtoxic threshold doses have not been shown to cause fetal abnormalities.

- Because of adverse effects associated with high levels of local anesthetics, it is important not to exceed the manufacturers recommended maximum dose.

Local Anesthetics

- Some topical anesthetics, including benzocaine, dyclonine, and tetracaine, may be acceptable but used with caution.

- There is no problem with topical lidocaine

Local Anesthetics

Agent	FDA PR* Category	Safe During Pregnancy?	Safe During Breastfeeding?
Local Anesthetics			
Articaine	C	Use with caution	Use with caution
Bupivacaine	C	Use with caution	Yes
Lidocaine (with or without epinephrine)	B	Yes	Yes
Mepivacaine (with or without levonordefrin)	C	Use with caution	Yes
Prilocaine	B	Yes	Yes
Benzocaine (topical)	C	Use with caution	Use with caution
Dyclonine (topical)	C	Yes	Yes
Lidocaine (topical)	B	Yes	Yes
Tetracaine (topical)	C	Use with caution	Use with caution

Analgesics

- The analgesic of choice during pregnancy is acetaminophen.
- Aspirin and nonsteroidal anti-inflammatory drugs convey risks for constriction of the ductus arteriosus, as well as for postpartum hemorrhage and delayed labor
- The risk of these adverse events increases when agents are administered during the third trimester.

Analgesics

- Therefore, it is best to avoid these analgesics (especially in the third trimester) or use them with caution.
- Risk also is more closely associated with prolonged administration, high dosage, and selectively potent anti inflammatory drugs, such as glucocorticoids and indomethacin.

Opioids

- Most opioids, including codeine, Demerol, and propoxyphene, are associated with multiple congenital defects and should be used cautiously and only if needed.

- The safety of hydrocodone and oxycodone is unclear, but because there is possibility of adverse respiratory effects, it is best to avoid them or use them with caution.

Analgesics

Agent	FDA PR* Category	Safe During Pregnancy?	Safe During Breastfeeding?
Analgesics and Antiinflammatories†			
Acetaminophen	B	Yes	Yes
Aspirin	C/D	Avoid	Avoid
Codeine	C	Use with caution	Yes
Glucocorticoids (dexamethasone, prednisone)	C	Avoid‡	Yes
Hydrocodone	C	Use with caution	Use with caution
Ibuprofen§	C/D	Avoid use in third trimester	Yes
Oxycodone	B	Use with caution	Use with caution

Antibiotics

Penicillins (including amoxicillin), erythromycin (except in estolate form), cephalosporins, metronidazole, and clindamycin are generally considered to be safe for expectant mothers and developing fetuses.

Tetracyclines

- The use of tetracycline, including doxycycline, is contraindicated during pregnancy.
- Tetracyclines bind to hydroxyapatite, causing brown discoloration of teeth, hypoplastic enamel, inhibition of bone growth, and other skeletal abnormalities.
- Clarithromycin should be avoided or use with caution

Antibiotics

Agent	FDA PR* Category	Safe During Pregnancy?	Safe During Breastfeeding?
Antibiotics¶#			
Amoxicillin	B	Yes	Yes
Azithromycin	B	Yes	Yes
Cephalexin	B	Yes	Yes
Chlorhexidine (topical)	B	Yes	Yes
Clarithromycin	C	Use with caution	Use with caution
Clindamycin	B	Yes	Yes
Clotrimazole (topical)	B	Yes	Yes
Doxycycline	D	Avoid	Avoid
Erythromycin	B	Yes	Use with caution
Fluconazole	C/D	Yes (single-dose regimens)	Yes
Metronidazole	B	Yes	Avoid; may give breast milk an unpleasant taste
Nystatin	C	Yes	Yes
Penicillin	B	Yes	Yes
Terconazole (topical)	B	Yes	Yes
Tetracycline	D	Avoid	Avoid

Antibiotics and Oral Contraceptives

This concern arises from the ability of select antibiotics such as rifampin, an antituberculosis drug, to reduce plasma levels of contraceptives.

It has been speculated that this interaction also may be seen with other antibiotics;

however, studies to date regarding other antibiotics have been less convincing.

Recommendations for prescribing antibiotics to a female patient who takes oral contraceptives:

“The dentist should
(1) advise the patient of the potential risk of the antibiotic’s reducing the effectiveness of the oral contraceptive,
(2) recommend that the patient discuss with her physician the use of an additional nonhormonal means of contraception,
(3) advise the patient to maintain compliance with oral contraceptives when concurrently using antibiotics.”

In general, dentists should provide treatment for acute infection irrespective of the stage of pregnancy.

Anxiolytics

Few anxiolytics are considered safe to use during pregnancy.
Benzodiazepines, zaleplon, and zolpidem should be avoided.
However, a single, short-term exposure to nitrous oxide–oxygen (N2O–O2) for less than 35 minutes is not thought to be associated with any human fetal anomalies, including low birth rate.
In contrast, however, chronic occupational exposure to N2O–O2 has been associated with spontaneous abortion and reduced fertility in humans.
Nitrous oxide may cause inactivation of methionine synthetase and vitamin B12, resulting in altered DNA metabolism that can lead to cellular abnormalities in animals and birth defects.

The following guidelines are recommended if N2O–O2 is used during pregnancy

Use of N2O–O2 inhalation should be minimized to 30 minutes.

• At least 50% oxygen should be delivered to ensure adequate oxygenation at all times.

• Appropriate oxygenation should be provided to avoid diffusion hypoxia at the termination of administration.

• Repeated and prolonged exposures to nitrous oxide are to be prevented.

• The second and third trimester are safer periods for treatment because organogenesis occurs during the first trimester.

Nursing

A potential problem arises when a nursing mother requires the administration of a drug in the course of dental treatment.

The concern is that the administered drug may enter the breast milk and be transferred to the nursing infant, in whom exposure may result in adverse effects.

Nursing

- Data on which to draw definitive conclusions about drug dosages and effects via breast milk are limited.
- The AAP concludes that “most drugs likely to be prescribed to the nursing mother should have no effect on milk supply or on infant wellbeing.”
- A significant fact is that the amount of drug excreted in the breast milk usually is not more than about 1% to 2% of the maternal dose.

Therefore, most drugs are of little pharmacologic significance to infants.

Nursing

Agreement exists that a few drugs, or categories of drugs, are definitely contraindicated for nursing mothers.
These include lithium, anticancer drugs, radioactive pharmaceuticals, and phenindione.3,41 Table 17.3 contains recommendations adapted from the AAP regarding the
administration of commonly used dental drugs during breastfeeding. As with drug use during pregnancy, individual
physicians may wish to modify these recommendations, which should be viewed only as general guidelines for treatment.
In addition to careful drug selection, nursing mothers
may take the drug just after breastfeeding and avoid
nursing for 4 hours or longer if possible. This should
result in reduced drug concentrations in the breast milk.

Agent	FDA PR* Category	Safe During Pregnancy?	Safe During Breastfeeding?
Local Anesthetics			
Articaine	C	Use with caution	Use with caution
Bupivacaine	C	Use with caution	Yes
Lidocaine (with or without epinephrine)	B	Yes	Yes
Mepivacaine (with or without levonordefrin)	C	Use with caution	Yes
Prilocaine	B	Yes	Yes
Benzocaine (topical)	C	Use with caution	Use with caution
Dyclonine (topical)	C	Yes	Yes
Lidocaine (topical)	B	Yes	Yes
Tetracaine (topical)	C	Use with caution	Use with caution

Agent	FDA PR* Category	Safe During Pregnancy?	Safe During Breastfeeding?
Analgesics and Antiinflammatories†			
Acetaminophen	B	Yes	Yes
Aspirin	C/D	Avoid	Avoid
Codeine	C	Use with caution	Yes
Glucocorticoids (dexamethasone, prednisone)	C	Avoid‡	Yes
Hydrocodone	C	Use with caution	Use with caution
Ibuprofen§	C/D	Avoid use in third trimester	Yes
Oxycodone	B	Use with caution	Use with caution

Agent	FDA PR* Category	Safe During Pregnancy?	Safe During Breastfeeding?
Antibiotics¶#			
Amoxicillin	B	Yes	Yes
Azithromycin	B	Yes	Yes
Cephalexin	B	Yes	Yes
Chlorhexidine (topical)	B	Yes	Yes
Clarithromycin	C	Use with caution	Use with caution
Clindamycin	B	Yes	Yes
Clotrimazole (topical)	B	Yes	Yes
Doxycycline	D	Avoid	Avoid
Erythromycin	B	Yes	Use with caution
Fluconazole	C/D	Yes (single-dose regimens)	Yes
Metronidazole	B	Yes	Avoid; may give breast milk an unpleasant taste
Nystatin	C	Yes	Yes
Penicillin	B	Yes	Yes
Terconazole (topical)	B	Yes	Yes
Tetracycline	D	Avoid	Avoid

*†In the case of combination products (such as oxycodone with acetaminophen), the safety with respect to either pregnancy or breastfeeding is dependent on the highest-risk moiety. In the example of oxycodone with acetaminophen, the combination of these two drugs should be used with caution, because the oxycodone moiety carries a higher risk than the acetaminophen moiety.
‡Oral steroids should not be withheld from patients with acute severe asthma.
§Ibuprofen is representative of all nonsteroidal antiinflammatory drugs. In breastfeeding patients, avoid cyclooxygenase selective inhibitors such as celecoxib, as few data regarding their safe use in this population are available, and avoid doses of aspirin higher than 100 milligrams because of risk of platelet dysfunction and Reye syndrome.
¶Antibiotic use during pregnancy: The patient should receive the full adult dose and for the usual length of treatment. Serious infections should be treated aggressively. Penicillins and cephalosporins are considered safe. Use higher-dose regimens (such as cephalexin 500 mg three times per day rather than 250 mg three times per day), as they are cleared from the system more quickly because of the increase in glomerular filtration rate in pregnancy.
#Antibiotic use during breastfeeding: These agents may cause altered bowel flora and, thus, diarrhea in the baby. If the infant develops a fever, the clinician should take into account maternal antibiotic treatment.

Dental Radiographs

Dental Radiographs

- Dental radiography is one of the more controversial area in the management of pregnant patients.
- Pregnant patients who require radiographs often have anxiety about the adverse effects of x-rays to their baby. In some instances, their obstetrician or primary care physician may reinforce these fears.
- In almost all cases involving dental radiography, these fears are unfounded.
- The safety of dental radiography has been well established, provided features such as fast exposure techniques (e.g., high-speed film or digital imaging), filtration, collimation, lead aprons, and thyroid collars are used.

Dental Radiographs

- Of all aids, the most important for pregnant patients are protective lead aprons and thyroid collars. In addition, the use of digital radiography markedly reduces radiation exposure, equal to or greater than that with the use of F-speed film.
- Ionizing radiation should be avoided, if possible, during pregnancy, especially during the first trimester because developing fetuses are particularly susceptible to radiation damage.
- However, if dental treatment becomes necessary, radiographs may be required to accurately diagnose and treat the patient.

Diagnostic radiologic procedures should not be performed during pregnancy unless the information to be obtained from them is necessary for the care of the patient and cannot be obtained by other means

Dental Radiographs

- dentist should understand the risks of ionizing radiation and know how to proceed as safely as possible in the
- event that radiographs are needed.
- The teratogenicity of ionizing radiation is dose dependent; therefore, it is necessary to understand the units of measurement.
- The absorbed dose is a measure of the energy absorbed by any type of ionizing radiation er unit of mass of any type of matter. The traditional unit of the absorbed dose is the rad (radiation absorbed dose).

Dental Radiographs

- Increased risk of adverse outcomes has not been detected among animals with continuous low-dose exposure less than 5 rad (5 cGy) throughout pregnancy.
- The National Council for Radiation Protection concluded that exposures less than 5 rads (5 cGy) were not associated with increased risk of malformations.
- Available animal and human data support the conclusion that no increase in gross congenital anomalies or intrauterine growth retardation occurs as a result of exposures during pregnancy totaling less than 5 cGy (5 rad).

Dental Radiographs

- Dental radiographs are less than natural daily background radiation.
- It should be noted, however, that maternal thyroid exposure to diagnostic radiation in excess of 0.4 mGy has been associated with a slight decrease in birth weight.
- This finding reinforces the importance of using a thyroid collar on pregnant patients.

Gestational age

- Teratogenicity is also dependent on the gestational age of the fetus at the time of exposure.
- During the organogenesis period (from the end of the 2nd to the 8th week post conception), fetuses are extremely sensitive to the teratogenic effect of ionizing radiation, particularly the central nervous system (CNS) between the 8th and 15th weeks of pregnancy.
- From the 16th to the 25th week, there is a reduction in the radiosensitivity of the CNS and in many of the other organs. After the 25th week, the CNS becomes relatively radioresistant, and major fetal malformations and functional anomalies are highly improbable.

Dental Radiographs

1) Maximum risk attributable to 1 cGy (which is more than 1000 full-mouth series with E-speed film and rectangular collimation or 10%–20% of the threshold dose) of in utero radiation exposure is estimated to be approximately 0.1%. This is a quantity thousands of times less than the normal anticipated risks of spontaneous abortion, malformation, or genetic disease.
2) The risk of a first-generation fetal defect from a dental radiographic examination is estimated to be 9 in 1 billion.
3) The third report found that the gonadal dose to women, after full-mouth radiography using a lead apron, is less than 0.01 μSv, which is at least 1000-fold below the threshold shown to cause congenital damage to newborns.

These figures indicate that :

With use of a lead apron, rectangular collimation, and E-speed film or faster techniques, one or two intraoral films are truly of minute significance in terms of radiation effects on a developing fetus.

- In terms that can be explained to a patient, one should consider the following:
- The gonadal or fetal dose of two periapical dental films (when a lead apron is used) is 700 times less than 1 day of average exposure to natural background radiation

Dental Radiographs

- Despite the negligible risks of dental radiography, dentists should not be cavalier regarding its use during pregnancy (or at any other time, for that matter).
- Radiographs should be used selectively and only when necessary and appropriate to aid in diagnosis and treatment.
- Bitewing, panoramic, or selected periapical films are recommended for minimizing patient dose.

To further reduce the radiation dose, the following measures should be used

- Rectangular collimation, E-speed or F-speed film or faster techniques (digital imaging reduces radiographic exposure by at least 50% compared with E-speed exposures), lead shielding (abdominal and thyroid collar), high kilovoltage (kV) or constant beams, and an ongoing quality assurance program.

Summery and Conclusion

References

- LITTLE AND FALACE'S DENTAL MANAGEMENT OF THE MEDICALLY COMPROMISED PATIENT, NINTH EDITION

THANKS FOR YOUR ATTENTION