



# INTERNATIONAL JOURNAL OF RESEARCH IN PHARMACEUTICAL SCIENCES

Published by JK Welfare &amp; Pharmascope Foundation

Journal Home Page: [www.ijrps.com](http://www.ijrps.com)

## A Review on Safety Endodontic Management in Pregnancy

Chanchal Rath<sup>1\*</sup>, Manoj Chandak<sup>1</sup>, Madhulika Chandak<sup>1</sup>, Pavan Bajaj<sup>2</sup>, Pooja Chandak<sup>1</sup><sup>1</sup>Department of Conservative Dentistry and Endodontics, Sharad Pawar Dental College and hospital, Datta meghe institute of medical sciences, deemed to be university(DU) Sawangi, Maharashtra, India<sup>2</sup>Department of Periodontics and implantology, Sharad Pawar Dental College and hospital, Datta meghe institute of medical sciences, deemed to be university(DU) sawangi, Maharashtra, India

### Article History:

Received on: 11 Jun 2020

Revised on: 09 Jul 2020

Accepted on: 26 Jul 2020

### Keywords:

Analgesics,  
antibiotics,  
endodontic treatment,  
local anaesthesia,  
pregnancy,  
radiographs,  
safety

### ABSTRACT

The dental practitioner provides dental treatment to pregnant women to maintain their oral health. This is known as Intrauterine Dentistry. Dental treatment neither is cancelled nor be obstructed after confirming the pregnancy. Precautions should be taken while performing a dental procedure. During pregnancy number of physiologic and hormonal changes are taking place. Due to this, the oral cavity is more prone to infection. Also, increased consumption of carbohydrates leads to more acid formation. Also, vomiting and saliva are reduced. Also, pregnant women are always at high risk for caries than non-pregnant women. So proper dental health care of a pregnant patient is utmost necessary. Endodontic treatment comprises the use of radiographs, local anaesthetic agents, intracanal irrigants, intra-canal medicaments, and drugs. While performing an endodontic procedure, a radiograph should be taken with minimal exposure and only when it is required. Also, local anaesthesia has been chosen depending upon its effects on the baby and pregnant women. Antibiotics like amoxicillin and cephalosporin are considered to be safe in pregnancy. Also, it is stated that the second trimester is the safest period for performing any dental treatment. Analgesics are also used when a patient is in pain condition. Whenever analgesia is required *paracetamol* is always used safely in pregnancy. It is the drug of choice for pain relief. Only plain paracetamol is indicated. So this review discusses endodontic consideration and possible risk while performing a dental treatment.



### \*Corresponding Author

Name: Chanchal Rath

Phone: 9503417602

Email: [chanchalrathidr@gmail.com](mailto:chanchalrathidr@gmail.com)

ISSN: 0975-7538

DOI: <https://doi.org/10.26452/ijrps.v11i4.3126>

Production and Hosted by

IJRPS | [www.ijrps.com](http://www.ijrps.com)

© 2020 | All rights reserved.

### INTRODUCTION

From the last ten years, dentistry has undergone many changes, especially related to preventive prac-

tice. Dental practitioners provide dental treatment to pregnant women to maintain their oral health. This is known as Intrauterine Dentistry. This term involved a multidisciplinary team of dentists, obstetricians and paediatricians (Fagoni *et al.*, 2014). Dental treatment neither is cancelled nor be obstructed after confirming the pregnancy. Precautions should be taken while performing dental treatment (Zanata *et al.*, 2004) During pregnancy, complete maintenance of oral hygiene should be done (Kloetzel *et al.*, 2011). During pregnancy number of physiologic and hormonal changes are taking place. Due to this, the oral cavity is more prone to infection. Also, increased consumption of carbohydrates leads to more acid formation. Also, vomiting and saliva are reduced (Enabulele and Ibha-

woh, 2015). Also, pregnant women are always at high risk for caries than non-pregnant women. So proper dental health care of a pregnant patient is utmost necessary. Endodontic management in pregnancy is related to the control of oral diseases. It also helps to maintain a healthy oral cavity. Endodontic treatment comprises the use of radiographs, local anaesthetic agents, intracanal irrigants, intra-canal medicaments, and drugs (analgesics and antibiotics). This review discusses endodontic consideration and possible risk while performing dental treatment.

### Dental treatment

It is a big question about performing the dental treatment in pregnant patient or not. The answer is that it should be performed at any phase of pregnancy. Second and third trimesters are a safe period to perform the dental treatment. Because it minimizes the chances of stillbirth or early delivery (Hemalatha *et al.*, 2013). Most of the gynaecologist (95%) recommend that dental treatment can be performed at any phase. From 16th to 32nd weeks of pregnancy is the most safer period. Morning appointments should not be given to the pregnant patient due to higher chance of nausea. During pregnancy, dental treatment is avoided due to a lack of knowledge about the importance of oral health care of a pregnant patient. Proper dental health care is necessary for both patient and baby. Also, the mother is not aware that her ignorance about periodontal and restorative therapy may put the baby at a more significant risk.

### First trimester (up to 14th week)

It is the most crucial phase in which rapid mitosis occurs. Also, quicker development of organs occurs between the 15 days to 2 months of post-conception. So in this period, there is a high-stress level present. More teratogens produce during this period. 45% to 74% of abortions occurred in this stage (Kurien *et al.*, 2013).

### Steps to be followed

1. Knowledge to the pregnant patient about maternal stomatic changes during pregnancy.
2. Strictly oral hygiene maintenance to control the plaque growth.
3. Only periodontal prophylaxis and emergency treatments should be performed (Kurien *et al.*, 2013).
4. Avoid radiographs. Take only when necessary.

### Second trimester (up 28th week)

Development of organ is finished during this period. So the risk to the fetus is minimal. Some elective and

emergent dentoalveolar procedures are safer in this phase (Kurien *et al.*, 2013).

### Steps to be followed

1. Strictly oral hygiene maintenance to control the plaque growth.
2. Scaling and root planing can be performed if it is needed.
3. Almost dental procedures are safe.
4. Avoid radiographs. take only when necessary.

### Third trimester (from 29th week till childbirth)

In this phase, there is no danger to the fetus. Pregnant women suffer from discomfort in this phase. Shorter dental appointments should be scheduled. Also, the supine position is avoided to avoid supine hypotension. It is safer to carry regular dental procedures in the starting phase. From the middle of the third trimester, usual dental treatment should be restricted (Kurien *et al.*, 2013).

### The recommendations are,

1. Strictly oral hygiene maintenance to control the plaque growth.
2. Scaling and root planing can be performed if it is needed (Ranka *et al.*, 2018).
3. Avoid radiographs.

### Endodontic Considerations

It includes -

- a) Use Of Radiographs
- b) Use of local anaesthesia
- c) Use Of intracanal irrigants and root filling material :
- d) Use of antibiotics and analgesic drugs

### Use of Radiographs

"According to (Lee *et al.*, 1999) " radio graphs should be taken only when it is necessary. It helps in diagnosis and emergency dental treatment. The radio graphs should be taken with minimal exposure (Lee *et al.*, 1999). However, chances of damage to the baby and mother are lesser. Because the radiation dose and exposure time are less, in the first three months, radio graphs should be avoided.

The teratogenic exposure to radiation of radiographic films is 1,000 times lesser than spontaneous miscarriage or malformation. The exposure to less than 5 rad minimizes the fetal malformation. 'According to (Timins, 2001), the mother exposure to x-ray should be less so that it does not cause any fetal malformation. High radiation exposure cause damage to the central nervous system of newborn/fetus (Timins, 2001).

Pregnancy risk (American Classification)	
<b>A</b>	Lack of evidence of risk in women
<b>B</b>	Lack of adequate studies in women. Animal studies failed to demonstrate risk.
<b>C</b>	Lack of adequate studies in women. Potential benefits may warrant use of the drug in pregnant women despite potential risks
<b>D</b>	There is positive evidence of human fetal risk. Only use if potential benefits justifies the potential risks
<b>X</b>	Studies demonstrated positive evidence of human fetal risk. The risks clearly outweigh potential benefits. Do not use under any circumstances.

Figure 1: American classification of pregnancy risk (Food and Drug Administration - FDA)

ANESTHETICS	RISK
Prilocaine	B
Lidocaine	B
Mepivacaine	C
Bupivacaine	C
Etidocaine	B
Tetracaine	C

Figure 2: Anesthetics used in dentistry

Following precaution should be taken for pregnant women while shooting the X-ray.

1. To direct the x-ray beam to the oral cavity, away the belly;
2. To use a lead apron and thyroid shield to the radiation effects;
3. To choose high-speed films that allow a short time (0.2 to 0.3 s);

### Use of Local anaesthesia

In Dentistry, local anaesthesia has been chosen depending upon its effects on the baby and pregnant women. Anaesthesia should include vasoconstrictors. It slows the absorption from the bloodstream and prolongs its action. Ultimately it reduces the toxicity of anaesthesia in pregnant women. "The obstetrician's evaluation on the health state of pregnant women with problems may help the dentist to select the best drug (Figures 1 and 2)".

The use of local anaesthetics like lidocaine is safer. Also, prilocaine and etidocaine are safer to use in pregnancy. But prilocaine crosses the placenta quicker than lidocaine and bupivacaine. It is because of its smaller molecular size. Excessive doses of prilocaine can cause methemoglobinemia. A large dose of prilocaine and articaine causes respiratory damages. It will ultimately lead to death. Lidocaine with adrenaline is the safer combination to use in pregnant women.

1.8 ml of 2% lidocaine with adrenaline was safer to use. It is useful for an operative procedure in pregnancy with rheumatic valvular heart disease (Miller, 1995). Bupivacaine and tetracaine are contraindicated. It will increase fetal bradycardia. Nitrous oxide is not safe to use in the first three months. Felypressin and bupivacaine should be avoided because it causes uterine contraction due to its long period of action. Fetus liver is not capable of metabolizing the mepivacaine. In pregnancy, LA with vasoconstrictor is not contraindicated. But it should not be used in special conditions like untreated hypertension, diabetes. It also avoids severe heart disease, hyperthyroidism.

"In patients taking drugs like tricyclic antidepressants, nonselective  $\beta$ -blockers, and cocaine anaesthesia is avoided" (Moore, 1998).

### Use of intracanal irrigants and root filling material

It is stated that neither the irrigating solution like sodium hypochlorite nor the obturating materials used in root canal treatment are harmful to the developing embryo (Chandak et al., 2017). The

early three months of pregnancy is important for the growth of the fetus. The second trimester is a perfect phase to undertake endodontic treatment. However, extensive elective root canal procedures should be postponed until delivery (Giglio et al., 2009).

### Use of antibiotics and analgesic drugs

#### Antibiotics

In any dental treatment, the first procedure is to eliminate the cause of infection. In fever or any inflammatory situation penicillin is the first choice of antibiotic. Among the penicillin group, amoxicillin is the most widely used. Amoxicillin and cephalosporin are considered to be safe in pregnancy (Miller, 1995; Little et al., 2008). If a patient is allergic to penicillin, erythromycin is the antibiotic of choice. *Chloramphenicol* and *Streptomycin* cause injury to the acoustic nerve of the fetus. Ultimately it inhibits various enzymatic systems and proven metabolism. This antibiotic alters and darkens the enamel. *Tetracyclines* also interfere in the development of the enamel. It also interferes in dentine formation. It changes the colour of enamel and detention from yellowish to greyish. Tetracycline form chelates when reacting with calcium ion present in teeth. It will lead to hypoplasia of teeth. Due to these mechanisms, it should be avoided during pregnancy and childhood (Miller, 1995). "According to (Gordon, 2002) in cases of severe infections, amoxicillin with clavulanate potassium should be given".

If patients are allergic to penicillin, clindamycin should be advised.

#### Analgesics and Anti-inflammatory drugs

Analgesics are used when a patient is in pain condition. Whenever analgesia is required *paracetamol* is always used safely in pregnancy. It is the drug of choice for pain relief. Only plain paracetamol is indicated. Paracetamol Combination with other analgesics should be avoided in pregnancy (Yagiela et al., 2011). Centrally acting analgesics should be cautiously given only in an emergency. Non-steroidal anti-inflammatory drugs (NSAIDs) should be carefully used in pregnancy. Many studies stated that aspirin should be contraindicated in pregnancy. It is because it interferes in releasing adenosine phosphate (ADP). So energy deficiency occurs. It will ultimately prolong the pregnancy. Also, its higher dose may cause oral clefts and other fetal defects.

"These drugs are classified as class D at the third trimester. It is because they have been associated with childbirth complications and constriction of the fetal ductus arteriosus" (Fagoni et al., 2014).

Acetaminophen is not associated with any complica-



tions during pregnancy. So it belongs to class B. And it is always considered the first choice of analgesic in pregnancy.

(Fagoni *et al.*, 2014). Ibuprofen is both an analgesic and non-steroidal anti-inflammatory drug. But it should be cautiously used during pregnancy because it may cause alterations in fetal and neonatal blood circulation. Aspirin and Ibuprofen obstructed the prostaglandin synthesis. It will lead to the earlier closure of the fetal ductus arteriosus resulting in pulmonary hypertension, due to this reason, fetal mortality rate increases. Corticosteroids can be recommended in surgical or endodontic procedures only in the situation when the treatment cannot be postponed until delivery.

### Anxiolytics

The use of benzodiazepines and other central nervous system depressants is questionable.

"Many studies stated that more chances of cleft lip and palate in children are occurred after using diazepam by pregnant women up to 6 months. So it should be contraindicated in pregnancy". Thalidomide is the sedative, sleep-inducing drug responsible for limb malformation. Aminopterin, used in the treatment of leukaemia, possesses higher toxicity causing thrombocytopenia and leukopenia. Barbiturates should not be indicated as they cause placenta rupture and fetal damages. If anxiolytics are required, consent from obstetrician is needed (Yagiela *et al.*, 2011).

### CONCLUSIONS

Use of radiographs, local anaesthesia, analgesics and antibiotics should be used cautiously in pregnant women with gynaecologist consent. Also, dental treatment should be done in the second trimester as it is the safest period. Avoid dental treatment when it is not necessary. So Proper assessment, intervention and patient education about the dental problem in pregnancy provide active dental treatment enhancing the maternal health with minimizing the fetal risk.

### ACKNOWLEDGEMENT

Author is thankful to Dr Manoj Chandak for guiding to write this review.

### Funding support

The authors declare that they have no funding support for this study.

### Conflict of interest

The authors declare that they have no conflict of

interest for this study.

### REFERENCES

- Chandak, M., Salgar, A., Nikhade, P., Shrivastava, S., Sahni, A., Chandak, R. 2017. Comparative evaluation of efficacy and effectiveness of profile rotary instruments in conjugation with solvent for retreatment of resilon and gutta-percha: An In vitro study. *Journal of Datta Meghe Institute of Medical Sciences University*, 12(2):115.
- Enabulele, J., Ibhawoh, L. 2015. Endodontic treatment of the pregnant patient: Knowledge, attitude and practices of dental residents. *Nigerian Medical Journal*, 56:311.
- Fagoni, T. G., de Vasconcelos, R. A., Cardoso, P. E. 2014. Dental treatment for the pregnant patient. *Brazilian Dental Science*, 17(3):3-10.
- Giglio, J. A., Lanni, S. M., Laskin, D. M., Giglio, N. W. 2009. Oral health care for the pregnant patient. *J Can Dent Assoc*, 75:43-51.
- Gordon, M. C. 2002. Maternal physiology in pregnancy. pages 63-91.
- Hemalatha, V. T., Manigandan, T., Sarumathi, T., Aarthinisha, V., Amudhan, A. 2013. Dental considerations in pregnancy - A critical review on the oral care. *J Clin Diagn Res*, 7(5):948-53.
- Kloetzel, M. K., Huebner, C. E., Milgrom, P. 2011. Referrals for Dental Care During Pregnancy. *Journal of Midwifery and Women's Health*, 56(2):110-117.
- Kurien, S., Kattimani, V. S., Sriram, R., Sriram, S. K., Rao, P., Bhupathi, V. K., Bodduru, A., Patil, R., N. 2013. Management of Pregnant Patient in Dentistry. *J Int Oral Health*, 5(1):88-97.
- Lee, A., Mcwilliams, M., Janchar, T. 1999. Care of the pregnant patient in the dental office. *Dent Clin of North Amer*, 43(3):485-94.
- Little, J. W., Falace, D. A., Miller, C. S., Rhodus, N. L. 2008. Dental Management of the Medically Compromised Patient. volume 456, pages 268-78. St. Louis: C.V. Mosby.
- Miller, M. C. 1995. The pregnant dental patient. *CDA J*, 23(8):63-70.
- Moore, P. A. 1998. Selecting drugs for the pregnant dental patient. *JADA*, 129:1281-85.
- Ranka, R., Patil, S., Chaudhary, M., Hande, A., Sharma, P. 2018. Prevalence of dental caries and gingivitis among pregnant and nonpregnant women. *Journal of Datta Meghe Institute of Medical Sciences University*, 13(1):44.
- Timins, J. K. 2001. Radiation during pregnancy. *New*

*Jersey Medicine*, 98(6):29–33.

Yagiela, J., Dowdfj, J. B., Mariotti, A. 2011. *Farmacologia terapêutica para dentistas*. Rio de Janeiro. Editora Guanabara. São Paulo. Elsevier Health Sciences.

Zanata, R. L., Fernandes, K., Navarro, P. 2004. Prenatal dental care: evaluation of professional knowledge of obstetricians and dentists in the cities of Londrina/PR and Bauru/SP, Brazil. *J Appl Oral Sci*, 16(3):194–200.