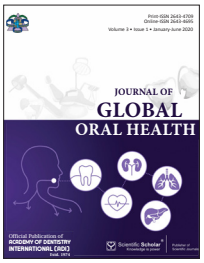
www.jglobaloralhealth.org

ScientificScholar®
Knowledge is power
Publisher of Scientific Journals

Journal of Global Oral Health



Review Article

Management of pregnant patient in orthodontic practice – A review

Madhulika Gupta[1], Ragni Tandon[1], Shally Mahajan[2], Kamlesh Singh[3], Pratik Chandra[1], Vishakha Agarwal[1]

[1]Department of Orthodontics and Dentofacial Orthopedics, Saraswati Dental College and Hospital, [2]Department of Dentistry, Dr. Ram Manohar Lohia Hospital, [3]Department of Orthodontics and Dentofacial Orthopedics, Saraswati Dental College and Hospital, Lucknow, Uttar Pradesh, India.

***Corresponding author:**
Madhulika Gupta,
Department of Orthodontics and Dentofacial Orthopedics, Saraswati Dental College and Hospital, Lucknow, Uttar Pradesh, India.

madhulika.310@gmail.com

Received: 10 June 2022
Accepted: 03 September 2022
EPub Ahead of Print: 17 October 2022
Published: 26 June 2023

DOI
10.25259/JGOH_26_2022

Quick Response Code:

ABSTRACT

Many patients seeking orthodontic treatment are young married women who are in the reproductive stage and sometimes, they become pregnant while undergoing orthodontic treatment. There has always been a dilemma about whether orthodontics and pregnancy could go side by side. It is important for the treating clinician to have a general understanding of the associated medical and dental conditions which may impact the treatment of a pregnant patient. This article provides some updates and key features for the orthodontists regarding the significant medical and dental conditions associated with the management of pregnant patients in an orthodontic clinic. A summarized literature pertaining to this issue and the available studies addressing dental and orthodontics care and treatment in different trimesters of pregnancy has been highlighted in this review.

Keywords: Pregnancy, Orthodontics, Management, Pregnant patients and orthodontics

INTRODUCTION

The demand for esthetics and orthodontics has influenced majority of young population over the years and most of them are women. The orofacial region is usually an area of significant concern especially for women because it draws attention at social gatherings.

Several times, women undergoing orthodontics treatment announce their pregnancy during mid-treatment or at times women seeking orthodontic treatment might be planning their pregnancy within the treatment duration.

Pregnancy is a special phase in a woman's life, demanding numerous emotional, physiological, psychological, and lifestyle changes.

Hence, an orthodontist has to take call on whether to continue the treatment by taking all the precautionary measures and educating the patient regarding the importance of oral hygiene or to delay the treatment until postpartum depending on several factors.

PERIODONTAL CONSIDERATIONS

Certain adults who require orthodontic treatment are pregnant women who are advised for the correction of malocclusion to avoid the potential risks associated with the accumulation of bacterial plaque, added to the lack of awareness about the oral health problems which could aggravate inflammatory reactions observed during the pregnancy.[1]

Ideally, women should begin their pregnancy without gingival and periodontal infection. Numerous evidence-based studies are available that find a positive co-relationship between the periodontal conditions and adverse pregnancy outcome.[2] Periodontal disease during pregnancy could have a causal relationship with low birth weight (LBW) babies.[3] Gingivitis and gingival hyperplasia have been associated with hormonal changes; hence, pregnant women are at increased risk for gingival inflammation [Figure 1].[4] Gram-negative bacteria such as porphyromonas intermedia, porphyromonas gingivalis, and bacteriodes species are associated with abnormal pregnancy outcomes such as reduced fetal weight and preterm births. Hence, it is important to create awareness among the patients regarding the importance of practicing oral hygiene measures during all the three trimesters of pregnancy. Tarannum and Faizuddin in a study reported that Indian women who did not receive prenatal periodontal treatment were 3.4–4.5 times more likely to deliver preterm infants, LBW, or both.[5]

Figure 1: Pregnancy gingivitis.

PREGNANCY EPULIS

Occasionally, a severe swelling is observed in the gingiva of pregnant women which is known as pregnancy tumor or epulis. It is a non-neoplastic and fibrous granulomatous lesion that develops during 3rd month of pregnancy or even at earlier phase due to the vascular response caused by the increased progesterone usually in patients with existing gingivitis.[6]

It may subside following the delivery of the child if the lesion is small but large lesions may require surgical excision in severe cases.[7] During the orthodontic treatment, if proper hygiene is maintained and regular oral prophylaxis, this condition could be kept under control.

EFFECT OF HORMONES DURING PREGNANCY

The cytokines produced in response to bacterial infection such as prostaglandins E2 and tumor necrosis factor alpha may cause damage to developing fetus.[8]

Estrogen inhibits the production of interleukins, thus decreasing the velocity of tooth movement. Estrogen inhibits bone remodeling by concurrently suppressing osteoblastogenesis and osteoclastogenesis from marrow precursors. Estrogen inhibits bone resorption through effect on the RANKL/RANL/osteoprotegerin system, as well as by reducing the production of several cytokines (such as IL-1 and IL-6), along with direct effects on osteoclast activity and lifespan.

Progesterone influences periodontal reconstruction in orthodontic tooth movement but long-term administration could reduce the rate of tooth movement in pregnant rats.[9]

Relaxin influences soft-tissue remodeling and several mediators that stimulate osteoclast formation.

Figure 2: Thermoluminescent dosimeter (TLD) in radiology apron.

Administration of relaxin might accelerate the early stages of tooth movement and, hence, can be used as an adjunct to orthodontic therapy for rapid remodeling of gingival tissue during extraction space closure.[10]

AWARENESS ASSOCIATED WITH DENTAL HEALTH IN PREGNANCY

In a study conducted among Indian population regarding awareness and need for oral health considerations among pregnant women, it was found that approximately 96% of pregnant women were not educated by the gynecologist about the impact of oral health in pregnancy.[2]

Out of 36 gynecologists and general dentists in Bengaluru, India around 85.7% of the gynecologist never examined the oral cavity in pregnant patients during the routine check-up.[2] As a result, lack of demand for oral health and limited access to associated services were identified as a barrier among the gynecologist for poor oral healthcare in pregnant patients. The majority of dentists accepted the limited knowledge about prenatal healthcare and the need for continuing dental education programs for the same. In

a survey conducted in Ohio, United States around 54% of women reported the need for dental care during pregnancy, but only 44% of them received the dental care. Less than 40% of women were advised to seek dental professionals by their gynecologist and 10% of the patients were refused treatment by the dentist during pregnancy.[11]

VARIOUS CONDITIONS ASSOCIATED WITH PREGNANCY

Pregnant women are susceptible to oral conditions such as tooth mobility, gingival inflammation, dental caries, and other conditions; hence, appropriate preventive oral health care could reduce the following conditions and the pain associated with them. A higher prevalence of dental pain has been revealed in pregnant patients indicating a need for proper oral healthcare services. In a study conducted in 2014, over half of the pregnant women reported dental pain whereas only 28% of the women opted for dental care. They reported that harmful stimulation of pulp tissue by the influence of hormonal changes on the pulp might lead to pain.[12]

Before continuing the treatment, it is advisable to consult the patient's obstetrician if any known complications are to be expected. History of current drugs and their possible side effects should be taken into consideration that might alter the course of orthodontic therapy. Drugs such as vitamin D could probably cause a reduction in tooth movement during the orthodontic treatment. Detailed patient history, medical conditions, and previous pregnancy-associated complications if any should be taken into account in advance before initiating orthodontic treatment.[13] It is always advisable to wait until postpartum in patients with a previous medical and dental history related to pregnancy-associated complications. A thorough dental history of the patient's attitude toward dental hygiene should be assessed. Oral conditions associated with mobility of teeth, caries, and periodontal pockets should be taken into consideration. A simple and least painful treatment should be planned for pregnant patients. Light orthodontic forces can be given.[14]

When a radiographic study is needed for appropriate management of a pregnant patient, the American College of Radiology recommends that "Healthcare workers should tell patients that x-rays are safe and provide patients with a clear explanation of the benefits of x-ray examination."[15] According to the American College of Radiology, "No single diagnostic procedure results in a radiation dose that threatens the well-being of the developing embryo and fetus."[7] According to America's National Council on Radiation Protection, "Fetal risk is considered to be negligible at 5 rad or less when compared to the other risks of pregnancy, and the risk of malformations is significantly increased above control levels only at doses above 15 rad."[16]

Exposure below 5 rad has not been associated with an increase in fetal anomalies on pregnancy loss and a single diagnostic radiographic procedure very early in prognosis does not harm a developed pre-embryo or embryo.[17] A panoramic study causes about one-third of the radiation exposure associated with a full-mouth series with an E-speed film and a rectangular collimated beam. This can be further reduced using a lead apron over the abdomen and thyroid collar [Figure 2].[18]

Estimated fetal exposure from a single diagnostic radiograph is 0.0001 rad. Diagnostic x-rays during pregnancy are considered safe, yet physicians should use reasonable caution while remaining sensitive to patients' fear and concerns.[19] A physician's caution should not become unreasonable. The exposure management of the pregnant patient in most situations should not place the fetus at increased risk. The most sensitive time for radiation effects on a fetus is between the 32nd and 37th day (approximately 4.5–5.5 weeks) of gestation since this is the time for organogenesis. The developing fetus must be in a direct pathway of radiation which is unlikely to occur during dental radiographs; hence, dental radiographs should not be contraindicated if there is a potential benefit to be gained.[20] Physiological changes during pregnancy are frequent and require immediate attention.

Pre-existing or chronic hypertension and gestational hypertension occur in 12–22% of pregnant women. Prenatal care providers should be consulted before initiating dental procedures in women with hypertension to classify the type of severity of hypertension and to rule out pre-eclampsia if indicated.[21]

Meticulous control to avoid or minimize dental infection is important for pregnant women with diabetes.[21]

During the second and third trimesters, a decrease in blood pressure and cardiac output can occur while the patient is in a supine position. It occurs due to the decrease in venous return to the heart from the compression of the inferior vena cava by the gravid uterus, which can result in a reduction in cardiac output. To prevent supine hypotensive syndrome in the dental chair, the pregnant woman should have the right hip elevated 10–12 cm, or placing the patient in a 5–15% tilt on her left side can relieve the pressure, a full left lateral position may be needed.[22]

Pregnant women have delayed gastric emptying and are always considered to have a "full stomach." Pregnant patients at times develop moderate hypoxemia and some develop abnormal alveolar-arterial oxygen gradient when placed in the supine position.[23] Ventilation patterns and patient position must be adjusted for the pregnant patient to avoid hypoxemia. Morning sickness also increases the risk of aspiration and vomiting due to the patient's enhanced gag reflex and decreased gastric emptying.

Table 1: Precautions to be taken during the trimesters of pregnancy.

1st Trimester	2nd Trimester	3rd Trimester
Avoid Extractions	Safe for extraction	Avoid Extractions
X-rays are not advised	X-rays using lead apron and thyroid collar	X-rays are possible
Avoid drug therapy	Drugs therapy after consulting with an obstetrician	Drugs therapy after consulting with an obstetrician
Avoid morning appointments	Regular oral prophylaxis and plaque control advised	Regular oral prophylaxis and plaque

Orthodontic treatment is not contraindicated in pregnant patients undergoing delivery under general anesthesia, but it is advisable to plan orthodontic treatment in such a way that orthodontic braces should be removed before electing for surgical procedures under general anesthesia to avoid any complications due to insertion of oral tubes in the operation theatre. During the 8 months of pregnancy, the fixed orthodontic appliances should be removed and a temporary removable appliance such as Hawley's, Wrap around retainers or Essix retainer could be delivered to hold the corrected dentition and fixed appliances could be continued during the postpartum period.

Premature labor can be faced while treating a pregnant patient and may be characterized by back discomfort, pelvic, and abdominal pressure or vaginal discharge. Premature labor signs should be taken seriously. Furthermore, short-term appointments should be given to the patients during the third trimester. The clinical precautions to be taken in different trimesters of pregnancy are summarized in [Table 1]. Drugs during pregnancy: There are a small number of drugs in dentistry that are teratogens or are contraindicated during pregnancy, it is always advisable to consult the gynecologist before prescribing medication.[23]

CONCLUSION

Preventive dental measures such as frequent checkups, oral health examinations, and updates regarding medical records and consultations with the gynecologist may aid in smooth orthodontic therapy during the pregnancy. Patient education and awareness play a major role in orthodontic treatment. Awareness among the health practitioner, patients, dental staff, and a joint venture between the orthodontist and the gynecologist can lead to a smooth and easy process during pregnancy. The clinical precautions to be taken in different trimesters of pregnancy are summarized in [Table 1]. A clear aligner could be a great tool for orthodontics in pregnant women. Further research is required regarding the use of aligners in pregnancy-associated orthodontics.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Gupta K, Saify M, Mahajan H, Jain DK, Gupta N. Orthodontic treatment considerations in pregnancy: An insight. J Orofac Res 2012;2:91-4.
2. Gupta S, Jain A, Mohan S, Bhaskar N, Walia PK. Comparative evaluation of oral health knowledge, practices and attitude of pregnant and non-pregnant women, and their awareness regarding adverse pregnancy outcomes. J Clin Diagn Res 2015;9:C26-32.
3. Offenbacher S, Katz V, Fertik G, Collins J, Boyd D, Maynor G, *et al.* Periodontal infection as a possible risk factor for preterm low birth weight. J Periodontol 1996;67:1103-13.
4. Lindhe J, Sonesson B. The effect of sex hormones on inflammation: II. Progestogen, oestrogen, and chorionic gonadotropin. J Periodontal Res 1967;2:7-12.
5. Tarannum F, Faizuddin M. Effect of periodontal therapy on pregnancy outcome in women affected by periodontitis. J Periodontol 2007;78:2095-103.
6. Sharma A, Mathur VP, Sardana D. Effective management of a pregnancy tumour using a soft tissue diode laser: A case report. Laser Ther 2014;23:279-82.
7. Hall EJ. Scientific view of low-level radiation risks. Radiographics 1991;11:509-18.
8. Sirisoontorn I, Hotokezaka H, Hashimoto M, Gonzales C, Luppanapornlarp S, Darendeliler MA, *et al.* Tooth movement and root resorption; the effect of ovariectomy on orthodontic force application in rats. Angle Orthod 2011;81:570-7.
9. Poosti M, Basafa M, Eslami N. Progesterone effects on experimental tooth movement in rabbits. J Calif Dent Assoc 2009;37:483-6.
10. Liu ZJ, King GJ, Gu GM, Shin JY, Stewart DR. Does human relaxin accelerate orthodontic tooth movement in rats? Ann N Y Acad Sci 2005;1041:388-94.
11. Strafford KE, Shellhaas C, Hade EM. Provider and patient perceptions about dental care during pregnancy. J Matern Fetal Neonatal Med 2008;21:63-71.
12. Krüger MS, Lang CA, Almeida LH, Bello-Corrêa FO, Romano AR, Pappen FG. Dental pain and associated factors among pregnant women: An observational study. Matern Child Health J 2015;19:504-10.

13. Michalowicz BS, Hodges JS, DiAngelis AJ, Lupo VR, Novak MJ, Ferguson JE, *et al.* Treatment of periodontal disease and the risk of preterm birth. N Engl J Med 2006;355:1885-94.
14. Almobarraz R. Orthodontic treatment and considerations during pregnancy. Int J Med Dent 2019;23:523-26.
15. Gray JE. Safety (risk) of diagnostic radiology exposures. In: Radiation Risk: A Primer. Reston, VA: American College of Radiology; 1996.
16. National Council on Radiation Protection and Measurements. Medical Radiation Exposure of Pregnant and Potentially Pregnant Women. NCRP Report No. 54. Bethesda, MD: The Council; 1977.
17. ACOG Committee on Obstetric Practice. ACOG Committee Opinion. Number 299, September 2004 (Replaces No. 158, September 1995). Guidelines for diagnostic imaging during pregnancy. Obstet Gynecol 2004;104:647-51.
18. Suri V, Singla R, Suri V. Oral health care in pregnancy: A review. J Adv Med Dent Sci Res 2017;5:9.
19. Toppenberg KS, Hill DA, Miller DP. Safety of radiographic imaging during pregnancy. Am Fam Physician 1999;59:1813-8, 1820.
20. National Health and Medical Research Council. Code of Practice for Radiation Protection in Dentistry. Canberra: Australian Government Publishing Service; 1987.
21. Kloetzel MK, Huebner CE, Milgrom P. Referrals for dental care during pregnancy. J Midwifery Womens Health 2011;56:110-7.
22. Duvekot JJ, Peeters LL. Maternal cardiovascular hemodynamic adaptation to pregnancy. Obstet Gynecol Surv 1994;49:S1-14.
23. Moore PA. Selecting drugs for the pregnant dental patient. J Am Dent Assoc 1998;129:1281-6.

How to cite this article: Gupta M, Tandon R, Mahajan S, Singh K, Chandra P, Agarwal V. Management of pregnant patient in orthodontic practice – A review. J Global Oral Health 2023;6:50-4.