



Teeth Care During Pregnancy Period (Mini Review)

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ABSTRACT

Pregnancy is a temporary physiology which causes a woman's body to shift her hormones. The consequences are widespread and oral alterations are very common. In the oral cavity, there are a number of particularly significant changes to periodontal diseases. These modifications have major effects, as unfavorable pregnancy results were known. Better understanding of these circumstances by health workers and women might help avoid or minimize these harmful events. Health training is an important strategy to raise awareness of improving oral health among pregnant women. Women in pregnancy, including some with definite signs of oral disease, often do not seek dental care. Preventive, diagnosis and restorative dental treatment is safe throughout pregnancy and effective to improve and sustain oral health and it is therefore important to educate pregnant women about the prevention and treatment of dental disorder, both for women's oral health and for their children's future oral health.

Keywords:

Dental, oral health, Pregnancy Review

Introduction

Pregnancy and early infancy are particularly crucial stages in which oral healthcare may have a lifetime influence since the consequences of poor oral health (Oral Health and Learning ,2001; Edelstein ,2002). Several national organisations, throughout pregnancy and early infancy, have made suggestions for promoting oral health. Bright Futures in Practice: In order to promote and improve the health and well-being of children, oral health was created at the national center for mother and children. (U.S.A. Pediatric Dentistry Academy, 2007). The community task force, the American Dental Association, the American Academy of Dentistry, the American Academy of Pediatrics, and the American Pediatrics Academy offered statements and recommendations on improving oral health

(Hale ,2003; American Academy of Pediatric Dentistry,2006).

In women, hormonal changes in the oral cavity can be observed during pregnancy, in particular, the changes of estrogens that can lead you to periodontal disorders: including gingivitis, periodontitis, gingival hyperplasia, pyogenic granulomas and other salivary abnormalities (Naseem et al 2015; Hartnett et al 2016) In most situations, because pregnant women think dental therapy during pregnancy has a negative impact on pregnancy, dental treatment typically retards and most women ignore the detrimental impact of poor oral hygiene on pregnancy. , Oral hygiene immediately impacts the self-respect of a person, speaks, nurturing and generally gives a pleasant feeling, and thus reduces the quality of life of pregnant women (Kirca ,2016).

While oral disorders are widely accepted to have a harmful effect on women throughout their pregnant life, there is some dispute as to whether these disorders might lead to harmful effects on fetuses and neonates. Systematic tests show that periodontal disease might be a possible premature risk factor, low birth weight and other adverse pregnant outcomes during pregnancy. The linkages remain unfinished though, since certain connections with the right adjustment of partial research methods and heterogeneity should be quite low [Ide and Papapanou, 2013; Corbella et al., 2016; Kumar, 2017].

Various research have shown that a poor maternal oral health, pregnancy and neonatal dentistry are related to premature delivery and birth weight, as well as an increased risk of early caries in children. Unfortunately, besides maintaining oral hygiene, pregnant women face many other barriers to optimum oral health, such as the lack of knowledge and value for dental services, adverse experiences in oral health, negative attitudes towards Oral health providers and dental staff bad conduct towards pregnant women. Faulty assumptions, too, frequently play a part in the hesitation of dentists to provide pregnant women with dental treatment (Naseem M et al, 2015; Kirca, 2016)

this systematic review aimed to identify and analyze the determinants of dental care attendance during pregnancy.

Oral Health And Pregnancy

For periodontal diseases, the anaerobic gram negative bacteria is responsible. Studies have demonstrated that periodontal infection can help preterm/low-weight infants grow (Caufield ,2005 ;Xiong etal,2006). Parodontal bacteria create many chemical inflammatory mediators that can directly affect the pregnant lady, including prostaglandins, interleukins, and tumor necrosis (Figure 1). Another important prediction of illness manifestation is the individual host reaction, partly mediated by a unique genotype (Romero etal,2004).

Scannapieco et al. noted in a recent systemic review that multiple research

involved periodontal disease as a risk factor for premature/low birth weight (Scannapieco etal,2003). However, they discovered that few of the research investigated the effects of periodontal disease prevention and treatment on birth results. Although it was not apparent if periodontal disorders were a cause of unfavorable embryo results, preliminary evidence revealed that periodontal treatments might prevent such unfavorable results. Whereas periodontal illnesses were not clear. The impact of periodontal therapy on the Three prospective intervention studies outcome of preterm delivery/low birth weight (Jeffcoat etal,2003). Lopez and colleagues published two studies conducted in Santiago(Scannapieco etal,2003).

Pregnant women were randomized in one investigation before 28 (early or postpartum) weeks of gestation (periodontal therapeutic treatment) (delayed). The incidence of preterm and low birth weight supply in the delayed therapy group was 9.5% and early treatment was 1.5%. Another study assigned 400 women randomly to the test group that receives periodontal therapy before 28 weeks before gestation or to the control group getting post-birth treatment (Caufield ,2005 ;Xiong etal,2006). .

In the control group the preterm/low birth rate was 8.6% while in the therapy group the rate was 2.5%. Preliminary findings of ongoing studies in which women were assigned to one of three treatment groups in the second quarter: prophylactic dental medications and placebo and periodontal therapy and placebo were published by Jeffcoat et al. Preliminary studies have indicated that 6.3% and 4. 9% of those receiving periodontal therapy and antibiotics and 0.8% of all those receiving periodontal placebo were prophylaxised and placebo delivers at least at 35 weeks, and 4.9% received (Jeffcoat etal,2003). Mitchell-Lewis et al. compared 90 teenagers without pregnancy who underwent periodontal therapy versus 74 who had no therapy. The delivery rate was in the control group 18,9 percent and in the therapy group 13,5 percent (Marin etal,2005).

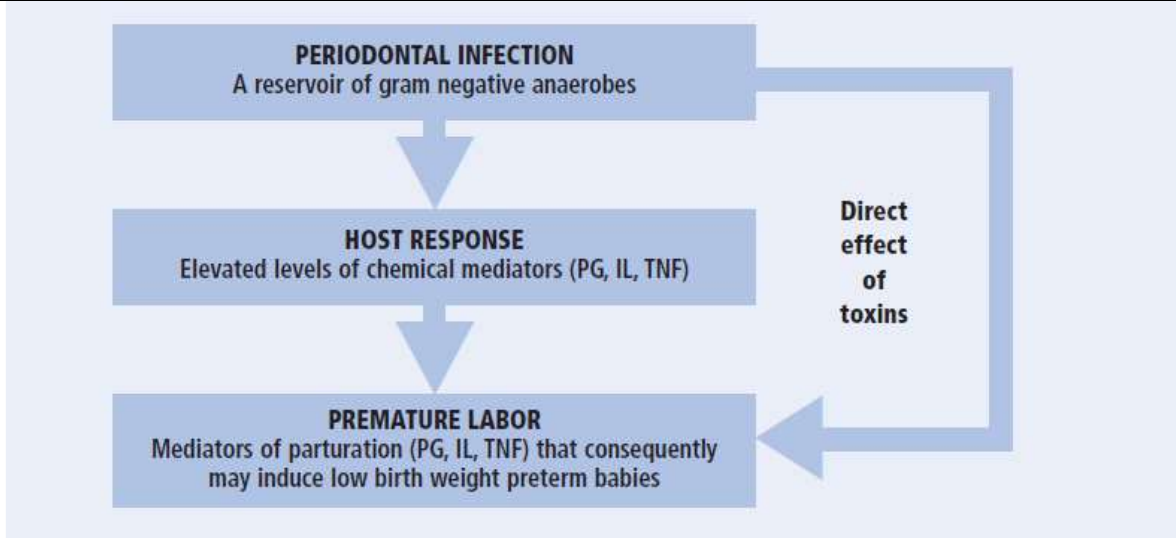


Figure 1. Low birth weight and periodontal diseases: Biological mechanism proposed

The effects of pregnancy on periodontal tissues

Gingivitis is an inflammatory plaque generated by gingiva that covers the alveolar bone and is part of the buccal mucosa around the tooth. During pregnancy, the swell of gingivae is enhanced in the inflammatory reaction to the tooth plaque. Pregnancy gingivitis (Palmer et al. 2003) is known to be aggravated by hormonal changes of pregnancy but this does not vary basically histologically from the one that develops in the not-pregnant state (Laine, 2002). In up to 100% of pregnant women, pregnancy gingivitis is the

most frequent oral pregnancy exposure (Palmer et al, 2003) In the second month of gestation, pregnant gingivitis often becomes evident and continues to peak in eight months. Gingivitis reductions generally were identical to that found shortly after partum in the second month of gestation in the last week of gestation and gingivitis tissues. 5 This does not necessarily mean, however, a return to health. Although gingivitis can identify or generalize its clinical properties, alterations that impact its anterior teeth are most evident (figure 2) despite a rise in plaque linked with its posterior teeth (Hunter et al, 1997).



Figure 2. Gingivitis pregnant that affects gingivitis, especially with the lower fore teeth but plaque stains on the tooth surfaces are minor.

A localized soft hyperplastic lesion occurs in gingival in up to 5% of pregnancies (Figure 3). Pregnancy Epulis (Laine ,2002) This highly vascularized, brilliant red lesion, which can superficially contain little white spots, is generally pedunculated and can reach a diameter of up to 2 cm. Although it may emerge from any gingival location, it is generally on the gingiva, mainly from the labial and upper jaws, that it arises on the papillary gingiva (Manson & Eley,1995) Teeth next to the epulis of pregnancy are drifting and moving. (Hunter etal,1997) Although bony damage rarely

develops immediately around the teeth. 4 It may be found at any time, but in the early pregnancy seems most prevalent. Given the unpleasant look and propensity to bleed of the pregnant epulis frequently on the front of the mouth, the lady is obviously concerned. Surgical removal during pregnancy should only take place if the epulis is traumatized by opposing teeth or eateries which cause pain and bleeding, interferes with regular voice and/or chewing, or is excessively bleeding and/or uncomfortable (Barak etal,2003)



Figure 3 . Pregnancy epulis

Corrections should also be made to any related local contributing elements. Due to the high repetition rate, surgery should ideally be deferred until the disease returns entirely or is at least smaller, Easy to remove fibers after delivery. However, if the operation has to be delayed, it is necessary to take removal during the second quarter and inform the woman of repetitive risk (Manson & Eley,1995).

The property of pregnancy on the host reaction and oral flora

In fact, the host response is mostly owing to that microbial onslaught, even if the damaging processes of periodontal disease (e.g. loss of the bone or periodontal ligament) are linked to plaque bacteria. Many host reaction components must be avoided to make sure that bacteria colonize subgingivals and reach the underlying connective tissue ultimately. Many

components of periodontium immune response appear to be affected by pregnancy with the result of decreased activity and efficiency in general (Laine,2002).

Main characteristics include decreased neutrophils, diminished chemotaxis and phagocytoses and antimicrobial impairment and cell mediation immunity; Since estrogen and progesterone receptors are plentiful, even the reaction of the tissue has an effect on progressive growth in pregnancy. All this affects the matrix of the extracellular, gingival or fibroblast (Mascarenhas etal,2003) The matrix appears to promote ostrogen that can control, differentiate and keratinize cell proliferation The synthesis along with progesterone also enhances the local production, especially prostaglandin E 2, by inflammatory mediators (PGE 2). Progesterone also impairs tissue homeostasis by lowering

the proliferation of fibroblasts, altering synthesis patterns in collagens and reduced plasminogen type 2 levels. The main inhibitor of tissue proteolysis is Progesterone (PAI-2) (Barak et al,2003) The primary culprits of parodontal diseases are gram negative anaerobic bacteria. These include *intermedia prevotella* (*F. intermedia*), *tannerella forsythensis*, *porphyromonas gingival* (*F. gingivalis*) and *treponema denticola*. While gingivitis and inflammation are difficult to detect during shock, the cause of some bacteria is associated with an increase in gram negative rods. However, selective growth of *P. intermedia*, *P. gingivalis* 10, and *Tannerella* (formerly *Bacteroides*) in subgingival plaques increased with the onset of gingivitis pregnancy (Darby et al,2003).

This is presumably because these species may utilise pregnancy hormones as a food source, in particular progesterone. Changes in the immune system during pregnancy together with local developments in the gingival tie, such as gingival blood leakage, supply additional nutrients and increased pocket depth, which give anaerobics a better habitat can also promote this rise in selective growth (Laine,2002).

Drugs during Pregnancy

A categorization of the food and drug administration shows the possible danger of medications causing birth abnormalities if taken during pregnancy (FDA). FDA has broken down the dependability of available scientific data and the cost-benefit ratio into five categories [Law et al,2010].

Category A: In the first trimester of pregnancy, adequate and well-controlled trials did not show fetal risk (and there is no evidence of risk in later trimesters).

Category B: Animal breeding studies have not shown any fetal danger and no proper and carefully controlled studies have been conducted in pregnant women.

Category C: Animal reproductive studies have been proven to have a detrimental effect on the fetus, and there have not been appropriate and well-checked investigations in human subjects.

Category D: There is a good evidence for a human fetus risk based on research, marketing and human studies data for adverse reactions, but possible advantages can, in spite of potential hazards, support the drug's usage in pregnant women.

Category X: Fetal abnormalities have been found in animals or human studies, or positive proof of human fetal risk based on research or marketing experience of adverse reactions, and possible benefits are obviously outstripped by hazards associated with the medication in pregnant women [Law et al,2010; FDA,2020].

All local anesthetic, which might have an effect on your fetus, may penetrate the placental barrier. Neurological and cardiovascular toxicity may be due to such medications. Lidocaine is the most freely moving percentage not associated with transport proteins, therefore lidocaine is highly transmitted from mother to fetus. Lidocaine is the most frequently used local anesthesia during pregnancy. Lidocaine Vasoconstrictors like epinephrine are typically complemented to improve its duration and minimize toxicity. Epinephrine-induced vasoconstriction slows and therefore, anesthesia absorption. With a broader security margin, the anesthesia is delivered to the fetus just as slowly. Since the anesthetics have little effects on the fetus, even at low dosages lidocaine is regarded generally safe in usage of 2 percent of epinephrine 1:100,000 [Lee et al,2017].

Antibacterial medicines with large safety indexes may be administered during pregnancy during continuing infectious pathological processes. Beta lactamines such as ampicillin, amoxicillin, and certain cephalosporins, as well as other macrolides, such as clarithromycin, or erythromycin, are regarded safe when they are treated [Bookstaver et al, 2015]. Rather, the female pregnant, the baby's dental dyschromy with gentamicin, The tetracyclines such as doxycycline or minocycline which produce fetal ototoxicity should not be impacted. Nystatin and clotrimazole are safe for antimungals, but fluconazole and ketoconazole harmful to the fetus should be avoided (Zhang et al, 2019).

In various varieties of mouthwash, chlorhexidine (0.05 to 0.2%) is an antibacterial component. It can be classified in FDA B since no significant doses of teratogenicity are available in animal studies, but no controlled pregnancy data are gathered (Brookes et al, 2020).

Patients undergoing oral bisphosphonate therapy Dental management

No special protocols are required for the oral management of these patients. Conservative dental treatment without bisphosphonate therapy should be provided at any time. Tartrectomy, filling processes, endodontic procedures, reconstructions and bridges can be shown without specific preventive measures being required in this context. The results achieved with regard to

orthodontic treatment may be seriously affected by reduction or abolition of osteoclast function. An informed consent statement of the patient should indicate that a failure to treatment is conceivable, even if it is a significant therapy. Furthermore, these techniques should seek to reduce extracts, tooth movement and tissue pressure during treatment and retention (Sidiropoulou-Chatzigiannis et al, 2007).

For each of the underlying bone procedures the following groups of patients are identified in line with the risk of maxilla osteonecrosis (time passed after starting therapy for BP and concurrent administration of immunopressants - corticosteroids, azathioprine, cyclophosphamide) (Scaling and Planing), etc.) (Figure 4):

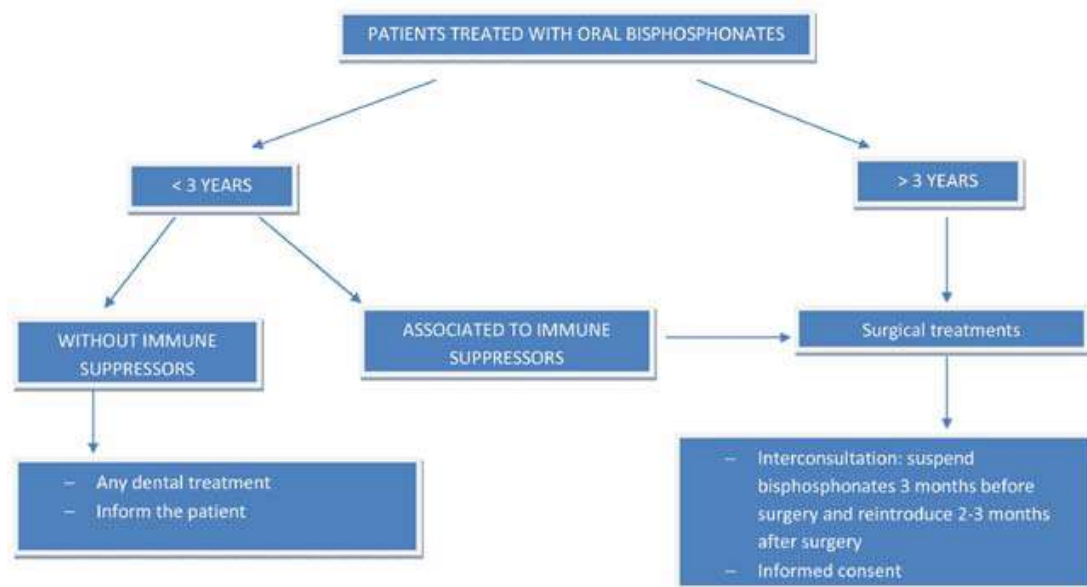


Fig. 4. Algorithm for dental management in patients treated with oral bisphosphonates

- Group 1: Patients without immune suppressants receiving oral BPs for at least three years. Without special precautionary measures, any type of treatment can be provided. With the signature of the respective informed consent document, it is recommended that the patient be notified of the existence of maxillary osteonecrosis and its association to BPs and dentistry. Regular follow-up visits are also necessary (Glowacki, 2007).
- Group 2: Patients with oral BP for at least three years and with oral BP for more than

three years as well as immune suppressants and oral BP patients. The prescriptive doctor must be consulted in order to evaluate the possibility of suspended bisphosphonate treatment at least three months prior to oral surgery unless the patient's risk of fracturing is high (age >70 years, pre-existing fracture, t-score densitometric density <-2,0), to prevent a BP therapy suspension. Bisphosphonate treatment should be restored after the cure is complete in the event of interruption (2-3 months after). Certain authors have recommended that serum CTX (collagen

breakdown product) be evaluated as the therapy with bisphosphonate is lowering these levels; therefore, CTX determination may be a reliable risk marker, even though several studies do not show a statistical significant connection between CTX serum and necrotic bone fragmentation or max exposure areas (Bagan et al,2009).

Role of dentist in oral health care

The dentist is to ensure to pregnant women, and that each dentist should assess their oral condition by applying different questions on pregnancy and the frequency of food, drinking and medication containing sugar and the use of pregnant women of tobacco, alcohol and recreational medicinal products, not to postpone or prevent oral health care during pregnancy. Medicine in oral medicine, including the use of x-rays, discomfort and local anesthetic is safe, important and covered in pregnancy (Oral health care during pregnancy,2011).

Dentists can aid a pregnant lady by promoting the maintenance of excellent buccal health during pregnancy (Chaveli et al,2011). Twice a day, the brush teeth are fluoridated by toothpaste. Select nutritious snacks and avoid sugar-containing meals and drinks. Get fluoride to drink water. Rinse your mouth in a cup of water with a baked bread soda teaspoon and slow the teeth for approximately an hour if you vomit.

Radiography is used to diagnose and treat dental disorders. They are also considered safe during pregnancy [Matteson et al,1991; Medical X-ray Imaging for D and R Health C, 2020]. The patient should be exposed to minimal radiation in order to limit the danger of possibly hazardous consequences. The FDA has released the recommendations for radiographic radiation produced by a dental expert group and are still urgently applicable during pregnancy:: It is important for the surgeon not to deliver more X-rays for the patient than is necessary; it must shield the patient from exposure to the belly and neck of the female and utilize the technology of long cones with suitable centering devices. Article 10 of the Italian Ministry of Health's Legislative Decree

187/00 on the health protection of pregnant women against ionizing radiation: The operator must enquire whether the lady is pregnant and take into account the genuine need for and urgency of x-ray, particularly if the radiation dosage to the uterus is over 1 mSv [Attuazione ,2000; Campos et al,2020].

Dentists should provide pregnant women with the proper management and treatment of emergencies and oral diseases in routine. Dentists should develop, discuss and provide comprehensive care for pregnant women, including prevention, therapy and maintenance of all oral medical care. Adequate position of the dental chair and standard practice should be followed when using restore material such as amalgam and composite with use of a rubber dam and high speed evacuation during the processes of endodontic and restorative treatment. Dentists should also inform families and the community about myths and facts about pregnancy (Trivedi et al,2015).

Conclusion

While international standards show that in pregnant patients diagnoses and treatments can occur, dentists are still reluctant to treat women during the pregnancy. This is out of fear, ignorance and incomprehension. On the other side, it is usually the pregnant woman herself who declines all dental care. Pregnancy is a particular occurrence characterized by numerous changes in oral cavity, however pregnant women who require treatment may be proven to be treated safely and securely. There are safe alternatives for every sort of medicine often used in dentistry. The second quarter is the optimal time to do the therapy. Published research says that the link exists between gingivitis and periodontitis pregnancy and aggravation, but additional research are needed to study the combination and effects of dental therapy in preventing negative pregnancy outcomes. A uniform diagnostic pathway and study parameters of periodontal diseases should be followed in particular.

Pregnancy is a dynamic condition that involves multiple physiological, general and oral changes. Good and effective maternal care is not only vital for it but also for a kid to be

born in the future. Good dental health is essential to prevent poor outcomes of pregnancy and to provide a healthy kid.

References

1. American Academy of Pediatric Dentistry. Policy on Oral Health Care Programs for Infants, Children, and Adolescents. Reference Manual 2005-2006.
2. Attuazione Della Direttiva 97/43/Euratom in Materia Di Protezione Sanitaria Delle Persone Contro I Pericoli Delle Radiazioni Ionizzanti Connesse Ad Esposizioni Mediche. (GU n.157 Del 7-7-2000— Suppl. Ordinario n.105) 187/00, Italy. 2000. Available online: <https://www.gazzettaufficiale.it/eli/gu/2000/07/07/157/so/105/sg/pdf> (accessed on 1 July 2020).
3. Bagan J, Scully C, Sabater V, Jimenez Y. Osteonecrosis of the jaws in patients treated with intravenous bisphosphonates (BRONJ): A concise update. *Oral Oncol.* 2009;45:551-4.
4. Barak S, Oettinger-Barak O, Oettinger M, Machtei EE, Peled M, Ohel G. Common oral manifestations during pregnancy: a review. *Obstet Gynecol Surv* 2003;58:624–28. doi:10.1097/01.OGX.0000083542.14439.CF
5. Barak S, Oettinger-Barak O, Oettinger M, Machtei EE, Peled M, Ohel G. Common oral manifestations during pregnancy: a review. *Obstet Gynecol Surv* 2003;58:624–28. doi:10.1097/01.OGX.0000083542.14439.CF
6. Bookstaver, P.B.; Bland, C.M.; Griffin, B.L.; Stover, K.R.; Eiland, L.S.; McLaughlin, M.M. A Review of Antibiotic Use in Pregnancy. *Pharmacother. J. Hum. Pharmacol. Drug Ther.* **2015**, *35*, 1052–1062. [[CrossRef](#)]
7. Brookes, Z.L.; Bescos, R.; Belfield, L.A.; Ali, K.; Roberts, A. Current uses of chlorhexidine for management of oral disease: A narrative review. *J. Dent.* **2020**, *103*, 103497. [[CrossRef](#)]
8. Campos, R.; Carmo, R.L.; Ferreira, Q.M.; Vilela, D.N.; Silqueira, L.F.; Costa-Silva, L. Imaging evaluation of nonobstetric conditions during pregnancy: What every radiologist should know. *Radiol. Bras.* **2020**, *53*, 185–194
9. Caufield PW. Dental caries: an infectious and transmissible disease where have we been and where are we going? *N Y State Dent J* 2005; 71(2):23-27.
10. Chaveli López B, Sarrión Pérez MG, Jiménez Soriano Y (2011) Dental considerations in pregnancy and menopause. *J Clin Exp Dent* 3(2): e135-144.
11. Corbella S, Taschieri S, Del Fabbro M, Francetti L, Weinstein R, Ferrazzi E: Adverse pregnancy outcomes and periodontitis: a systematic review and meta-analysis exploring potential association. *Quintessence Int* 2016; 47: 193– 204.
12. Darby ML, Walsh MM. Women's health. In: *Dental Hygiene: Theory and Practice*. 2nd ed. St Louis: WB Saunders; 2003. p. 932–44.
13. Edelstein BL. Foreword to the Supplement on Children and Oral Health. *Ambulatory Pediatrics* 2002; 2(2):139-140.
14. FDA. Access Data FDA. August. 2020. Available online: https://www.accessdata.fda.gov/drugsatfda_docs/label/2020/016964s082lbl.pdf (accessed on 1 January 2021).
15. Glowacki J. Impact of postmenopausal osteoporosis on the oral and maxillofacial surgery patient. *Oral Maxillofac Surg Clin North Am.* 2007;19:187-98, vi.
16. Hale KJ. Oral health risk assessment timing and establishment of the dental home. *Pediatrics* 2003; 111(5 Pt 1):1113-1116.
17. Hartnett E et al. Oral Health in Pregnancy. *JOGNN* 2016;45:565–57.
18. Health C for D and R. Medical X-ray Imaging—The Selection of Patients for Dental Radiographic Examinations.

- Available online:
<https://www.fda.gov/radiation-emitting-products/medical-x-ray-imaging/selection-patients-dental-radiographicexaminations> (accessed on 1 August 2020).
19. Hunter L, Hunter B. Oral and dental problems associated with pregnancy. In: *Oral Healthcare in Pregnancy and Infancy*. London: Macmillan Press Ltd 1997. p. 27–34.
 20. Ide M, Papapanou PN: Epidemiology of association between maternal periodontal disease and adverse pregnancy outcomes – systematic review. *J Clin Periodontol* 2013; 40(suppl 14):S181–S194.
 21. Jeffcoat MK, Hauth JC, Geurs NC, Reddy MS, Cliver SP, Hodgkins PM et al. Periodontal disease and preterm birth: results of a pilot intervention study. *J Periodontol* 2003; 74(8):1214–1218.
 22. Kirca N. The importance of oral - dental health in pregnancy. *Adv Dent & Oral Health* 2016;7(2):1-3.
 23. Kumar PS: From focal sepsis to periodontal medicine: a century of exploring the role of the oral microbiome in systemic disease. *J Physiol* 2017; 595: 465–476.
 24. Laine MA. Effect of pregnancy on periodontal and dental health. *Acta Odontol Scand* 2002;60:257–64. doi:10.1080/00016350260248210
 25. Law, R.; Bozzo, P.; Koren, G.; Einarson, A. FDA pregnancy risk categories and the CPS. *Can. Fam. Phys. Med. Fam. Can.* **2010**, 56, 239–241.
 26. Lee, J.M.; Shin, T.J. Use of local anesthetics for dental treatment during pregnancy; safety for parturient. *J. Dent. Anesth. Pain Med.* **2017**, 17, 81–90. [CrossRef]
 27. Manson JD, Eley BM. The effect of systemic factors on the periodontal tissues. In: *Outline of Periodontics*. 3rd ed. Oxford: Butterworth- Heinemann Ltd; 1995. p. 71–89.
 28. Marin C, Segura-Egea JJ, Martinez-Sahuquillo A, Bullon P. Correlation between infant birth weight and mother's periodontal status. *J Clin Periodontol* 2005; 32(3):299-304.
 29. Mascarenhas P, Gapski R, Al-Shammari K, Wang H-L. Influence of sex hormones on the periodontium. *J Clin Periodontol* 2003;30:671–81. doi:10.1034/j.1600-051X.2003.00055.x
 30. Matteson, S.R.; Joseph, L.P.; Bottomley, W.; Finger, H.W.; Frommer, H.H.; Koch, R.W.; Matranga, L.F.; Nowak, A.J.; Rachlin, J.A.; Schoenfeld, C.M. The report of the panel to develop radiographic selection criteria for dental patients. *Dev. Dent.* **1991**, 39, 264–270.
 31. Naseem M et al. Oral health challenges in pregnant women: Recommendations for dental care professionals. *The Saudi Journal for Dental Research* 2015.
 32. Oral Health and Learning. National Center for Education in Maternal and Child Health, 2001.
 33. Oral health care during pregnancy: A national consensus statement (2011). <http://www.mchoralhealth.org>
 34. Palmer R, Soory M. Modifying factors: diabetes, puberty, pregnancy and the menopause and tobacco smoking. In: Linde J, Karring T, Lang NP, editors. *Clinical Periodontology and Implant Dentistry*. 4th ed. Oxford: Blackwell Munksgaard; 2003. p. 184–86.
 35. Romero R, Chaiworapongsa T, Kuivaniemi H, Tromp G. Bacterial vaginosis, the inflammatory response and the risk of preterm birth: a role for genetic epidemiology in the prevention of preterm birth. *Am J Obstet Gynecol* 2004; 190(6):1509-1519.
 36. Scannapieco FA, Bush RB, Paju S. Periodontal disease as a risk factor for adverse pregnancy outcomes. A systematic review. *Ann Periodontol* 2003; 8(1):70-78.
 37. Sidiropoulou-Chatzigiannis S, Kourtidou M, Tsalikis L. The effect of osteoporosis on periodontal status, alveolar bone and orthodontic tooth movement. A literature review. *J Int Acad Periodontol.* 2007;9:77-84.

38. Trivedi S, Lal N, Singhal R. Periodontal diseases and pregnancy. *J Orofacial Sci* 2015;7:67.
39. Xiong X, Buekens P, Fraser WD, Beck J, Offenbacher S. Periodontal disease and adverse pregnancy outcomes: a systematic review. *BJOG* 2006; 113(2):135-143.
40. Zhang, Z.; Zhang, X.; Zhou, Y.; Jiang, C.; Jiang, H. The safety of oral fluconazole during the first trimester of pregnancy: A systematic review and meta-analysis. *BJOG Int. J. Obstet. Gynaecol.* **2019**, 126, 1546–1552. [[CrossRef](#)]