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Oral and Dental Health Care During Pregnancy

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Abstract

Oral cavity is generally regarded as the mirror of human health as it reflects almost all the systemic alterations occurring in our body. During the dynamic stages of pregnancy, body is subjected to both reversible and irreversible hormonal changes which in turn affects oral cavity. Oral health of the mother can have significant implications on birth outcomes and infant oral health. Maternal periodontal disease has been associated with pre-term birth, development of preeclampsia, and low birth weight infants.

The oral flora of mother is transmitted to the newborn, and increased maternal cariogenic flora predisposes the incidence of infant caries. So preconception, pregnancy, or intrapartum treatment of oral diseases can greatly improve general as well as oral maternal health, pregnancy outcomes, and new born dental health. This article reviews the dental health problems affecting pregnant women along with management protocols and preventive strategies for dental diseases like caries and periodontitis. A note on prenatal counselling, risk of medication to both mother and foetus and appropriate scheduling of dental procedures during pregnancy has also been included.

Keywords: *Pregnancy; Dental Caries; Periodontal Disease; Preterm birth; Low birth weight babies; Anticipatory Guidance*

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Introduction

Pregnancy is a unique period during a woman's life where several complex physiological changes occur in the body which can affect oral health [1]. A women's encounter with most prevalent diseases of oral cavity such as periodontitis or dental caries in the preconception and pregnancy period can affect her own general health status and pregnancy outcome. Although preventable through noninvasive interventions, both these oral problems are prevalent in women of childbearing age, particularly among low-income groups.

The major oral changes seen in pregnant ladies such as caries, gingivitis, periodontitis and gingival hyperplasia are associated with higher levels of circulating estrogen [2]. A high level of estrogen is associated with gingivitis and gingival hyperplasia while melasma in the midface region is associated with progesterone [3]. Several studies have linked maternal oral health to pregnancy outcomes and dental health of offspring. Preterm delivery, low birth weight and high risk of early caries in offspring are some of the parameters that have been corroborated to poor maternal oral health [4].

Pregnant patients often face several impediments in their quest for achieving optimal oral health. The overcautious approach of dental staff to pregnant patients can be due to lack of knowledge or experience in treatment, fear of medico-legal action or ignorance of accepted practice guidelines. This is often compounded by the patients past negative oral health experiences [5]. It is imperative that an effective model for management of dental problems in the pregnant patient should be designed which should encompass a multidisciplinary partnership between dental and medical professionals [6].

Systemic Changes in Pregnancy

The changes in hormonal milieu during pregnancy and puerperium cause numerous physiological systemic changes. The cardiovascular changes in pregnancy include increase in cardiac output, heart rate and plasma volume. A benign systolic ejection murmur caused by increased blood flow across pulmonary and aortic valves require no treatment. Pregnant patients are also susceptible to postural hypotension as a result of vasomotor instability [7]. In GIT there is decrease in lower esophageal tone along with gastric and intestinal motility due to reduced progesterone levels. Gag reflex is exacerbated.

Displacement of stomach with consequent increase in uterine size results in increased intragastric pressure. Nausea, vomiting and ptyalism are also common [7]. Respiratory signs include displacement of diaphragm superiorly resulting in decreased functional reserve capacity. Hyperventilation along with increased risk of apnea and dyspnea occur [7]. Different stages of pregnancy can cause physiologic hematological changes. During pregnancy the blood volume increases by 1.5L in order to meet the demands of the new vascular bed and to compensate for blood loss during delivery [8]. The physiologic stress induced by the pregnant state causes leukocytosis [9]. The general changes include mood and behavioral abnormalities are very common in pregnancy. There are also increased nutritional demands to meet the requirements of both mother and fetus.

Common dental problems in pregnancy and their management

Dental caries

Pregnant women are always prone to higher incidence of dental caries.Recurrent vomiting during pregnancy enhances acidic environment leading to progress of caries [10]. Some expectant mothers also have craving for sugary diet and also show low attention to oral health. If dental lesions are left untreated it can lead to problems like dento-alveolar abscess and cellulitis [11]. In early caries, restorative treatment is done. Amalgam is the choice in posterior teeth as there is no evidence to show that amalgam exposure during pregnancy has deleterious effects such as spontaneous abortion and child birth [12]. Composite restorations are useful for anterior teeth and glass ionomer for small restorations [13]. Endodontic treatment can be done during pregnancy in case of serious pulpal pain following odontogenic infection and the ideal time is the second trimester [14].

Gingivitis

Gingivitis is the most common oral disease in pregnancy. An alteration in oral flora, decreased immune response and increase in estrogen and progesterone levels can lead to gingivitis during pregnancy [15]. Scaling, daily tooth brushing with fluoridated tooth paste, flossing and saline mouth rinses should be used. Chlorhexidine mouth rinses have additional benefit [16].

Periodontitis

Destructive inflammation of periodontal tissue is often followed by bacterial infiltration into periodontal fibers. Periodontal pocket is formed by inflammatory response stimulated by toxins released by infiltrated bacteria which leads to tooth mobility. Cytokines,

prostaglandins and interleukins are elevated in pregnancy [17]. An association between periodontitis during pregnancy and low birth weight (LBW) and very low birth weight (VLBW), pre-eclampsia and gestational diabetes mellitus have been shown in several studies [18]. Studies have shown that scaling and root planning are safe during pregnancy. 0.2% chlorhexidine mouth rinses are useful [19].

Pregnancy Tumor

Pregnancy tumor or pregnancy granuloma or pyogenic granuloma is mainly due to a combination of high progesterone levels, bacteria and local irritants, mainly calculus. It appears as a smooth lobulated mass. Gingiva is the commonest site followed by tongue, palate and buccal mucosa [20]. Pyogenic granulomas usually regress post-delivery. Excision is done only if there is problem of mastication. Excision during pregnancy often leads to recurrence and hence best avoided [21].

Tooth Mobility

Increased estrogen and progesterone levels affect the periodontal ligament leading to tooth mobility. It is usually transient and returns to normalcy post-partum [22].

Tooth Erosion

Hyperemesis during pregnancy can lead to tooth erosion. Palatal surface of maxillary incisors and canines are mostly affected and presents as sensitivity. Regular fluoride rinse and bicarbonate rinse for acid neutralization are useful [23].

Pharmacodynamics in Pregnancy

Anatomic and physiological changes in pregnancy affect the absorption, distribution, metabolism and elimination of different therapeutic agents [24]. During pregnancy, there is a high volume of drug distribution, decline in maximum plasma concentration, shortened plasma half-life, rise in lipid solubility and rate of clearance. These factors lead to drugs crossing the placental barrier leading to low fetal birth weight, teratogenicity and miscarriage. Therefore administration of drugs in first trimester should be done with extreme caution [25].

Analgesics

Drugs used for short term to treat specific disease processes. Acetaminophen (group B) daily intake in pregnant patients should be limited to 4g/day due to risk of hepatotoxicity [26]. Ibuprofen is a category B analgesic in first and second trimester while in the third trimester it is considered a category D drug because it is associated premature closure of fetal ductus arteriosus, lower amniotic fluid level and inhibition of labor [27]. A combination of acetaminophen with codeine or oxycodone is recommended to pregnant patients. Overdose of this combination can result in neonatal respiratory depression [28].

Antibiotics and Antimicrobials

Tetracycline and its derivatives like doxycycline belong to category D because of its effects on developing bone and teeth [29]. Ciprofloxacin and other quinolones belong to category C and the drug is involved in arthropathy with severe effects on evolving cartilages [30]. Metronidazole, a group B drug is not used in the first trimester because of its teratogenicity but some recent studies suggest otherwise [31]. Erythromycin estolate and other macrolides should be avoided because of deleterious effect on mother's liver [32]. The risk benefit ratio should be evaluated and obstetrician consultation is required before prescribing any antibiotics.

Local and General Anesthetics

Local anesthetics are considered to be relatively safe in pregnancy. Lidocaine and Prilocaine are category B drugs while Bupivacaine, Artricaine, Mepivacaine and Epinephrine are category C drugs. Epinephrine in intravascular route can theoretically cause insufficient uroplacental blood flow but in practice, 1:100000 concentrations used in dentistry is considered safe [33]. Nitrous oxide commonly used for surgical procedures is reported to cause abortions, preterm birth and birth defects as it is known to affect Vitamin B12 metabolism rendering the enzyme methionie synthetase inactive which is vital for DNA production and hence affects organogenesis. After first trimester short term administration of nitrous oxide with minimal concentration if 50% oxygen is considered safe [34].

Teratogenicity

Teratogen is an agent or factor that cause malformation of an embryo. Alcohol, cocaine, Thalidomide, anticonvulsants, ACE inhibitors, Retinoids, Phenytoin and Valproic acid are some of the accepted teratogens. These drugs should be completely avoided in first trimester of pregnancy [35].

Dental Radiations and Pregnancy

Dental radiography is usually considered safe in pregnancy. Radiation exposure over 10 rads is considered hazardous as it can contribute to mutation, mental retardation and ophthalmic problems. Since the fetus receives only 0.01 rads during a maternal dental radiography it is unlikely to cause significant abnormalities. Experts however advice to avoid dental radiography during pregnancy. In case of absolute necessity, precautions like thyroid collar, lead apron and speed films should be used [36].

Management Protocols during Pregnancy

The patient should be educated for changes in oral mucosa during pregnancy. The first trimester is the period of organogenesis when the patient is susceptible to teratogenicity and spontaneous abortions. Radiographs should be avoided and patient should be instructed to maintain good oral hygiene. Periodontal prophylaxis and emergency treatment can be done at this stage [37]. The second trimester is an ideal time to perform dental treatment. Elective treatments like endodontics, restorations, extraction, scaling, polishing and curettage can be done [37]. In the third trimester risk of fetus is negligible but the mother has an increased risk of discomfort. The middle of third trimester is ideal for treatment. Elective procedures as well as scaling, polishing and curettage can be done at this stage. Oral hygiene and plaque control are important [37].

Dental Chair Positioning During Pregnancy

The supine position should be avoided as it can lead to supine hypotensive syndrome. It causes a decrease in cardiac output resulting in hypotension, syncope and uteroplacental perfusion. Supine position may cause decrease in arterial oxygen tension and increase the incidence of dyspepsia from gastroesophageal reflux secondary to incompetent lower esophageal sphincter. Supine position causes compression of inferior vena cava leading to venous stasis and clot formation [38]. The patient should be positioned in the chair with the right hip elevated 10-12 centimeters so that pressure on the vena cava is reduced by placing the patient in a 5-15% tilt on left side. In case if hypotension persists, patient should be kept in left lateral position [39].

Patient Counselling

The main goal is to create awareness among the expectant mothers. Procedures like restorations and oral prophylaxis decrease the microorganisms in the mother's mouth thereby reducing transmission to the child. Improving the expectant mother's oral hygiene and dietary habits can have a significant impact on child's oral health [40].

Anticipatory Guidance [41]

It is the process of providing practical, developmentally appropriate information of child's health to the parents. Recommendations include;

1. Educate patient about oral disease and its prevention with demonstration of oral hygiene can be done to improve patient's attitude and motivation
2. Eating healthy foods containing proteins and vitamins like fresh fruits vegetables and dairy products. Limit sugar consumption and avoid smoking.
3. Brushing thrice daily with fluoridated tooth paste and rinsing oral cavity with alcohol free mouth wash before bed.

Maternal Oral Health and Pregnancy Outcome

In a case-control study of 124 pregnant women, Offenbacher and colleagues in 1996 had found out a potential association between maternal periodontitis and delivery of low birthweight/preterm infants. They observed that in women who had significantly worse

periodontal disease delivered at <37 weeks of gestation or an infant <2.5 kg compared to the control women. The odds ratio of the study was ~7; led the authors to conclude that periodontitis may represent clinically significant risk factor for delivery of a preterm low birth weight infant [42]. They measured levels of PGE2 and IL-1ß in gingival crevicular fluid of 48 mothers who delivered preterm, low birth weight infants and compared it to control women and found out that levels of PGE2 were significantly higher in cases compared to control women [43].

Conclusion

The existing data support the role of maternal periodontitis as a potential risk factor for adverse outcomes of pregnancy such as preterm birth. Further studies to better understand the mechanism of periodontitis associated preterm birth will enable us to tailor treatment to those women who might be mostly benefited. Optimal oral health is very important for dental patient and should be administered safely and effectively. Drug administration, treatment of oral infections, radiation exposure, chair side procedures, timing of dental appointments are all important aspects to be considered while providing dental care to a pregnant lady. To improve oral and systemic health outcomes to mothers and newborns, an interdisciplinary co-operation between health professionals should be given priority.

References

1. Oral Health during Pregnancy Expert Workgroup. Oral health care during pregnancy. A national consensus statement. Washington DC: National Maternal and Child Oral Health resource centre; (2012).
2. Tarsitano and Rolings RE. "The pregnant dental patient: evaluation and management". *General Dentistry* 41.3 (1993): 226-234.
3. LaineMA. "Effect of pregnancy on periodontal and dental health." *Acta Odontologica Scandinavica* 60.5 (2002): 257-264.
4. HemalathaV., *et al*. "Dental Considerations in Pregnancy-A Critical Review on the Oral Care". *Journal of Clinical and Diagnostic Research* 7.5 (2013): 948-953.
5. Michalowicz BS., et al. "Examining the Safety of Dental Treatment in Pregnant Women". *The Journal of the American Dental Association* 139.6 2008): 685-95.
6. MonaT., *et al*. "Dental care use and self-reported dental problems in relation to pregnancy." *American journal of Public Health* 94.5 (2004): 765-771.
7. Priya Soma Pilay., *et al*. "Physiological changes in Pregnancy". *Cardiovascular Journal of Africa* 27.2 (2016): 89-94.
8. Ramsay Margaret. "Normal hematological changes during pregnancy and the puerperium." In: Pavord S, Hunt B, editors. The obstetric hematology manual. Cambridge: Cambridge University Press; (2010): 1-11.
9. Fleming AF. "Hematological changes in pregnancy". *Clinical Obstetrics and Gynecology* 2 (1975): 269.
10. Stalp S and Zuhrt R. "Dental caries and Pregnancy". *Stomao lDDR* 29.6 (1979): 481-484.
11. GiglioJA., *et al*. "Oral health care for pregnant patient". *Journal of the Canadian Dental Association* 75.1 (2009): 43-48.
12. Melkonian R and Baker D. "Risks of industrial mercury exposure in pregnancy". *Obstetrical & Gynecological Survey* 43.11 (1988): 637-641.
13. Zanata RL., *et al*. "Clinical evaluation of Three Restorative Materials Applied in a Minimal Intervention Caries Treatment Approach". *Journal of Public Health Dentistry* 63.4 (2003): 221-226.
14. Louis Ibhawoh and Joan Enable. "Endodontic treatment of the pregnant patient: Knowledge, attitudes and practices of dental residents". N*igerian Medical Journal* 56.5 (2015): 311-316.
15. Figuero E., *et al*. "Effect of pregnancy on gingival inflammation in systemically healthy women: A systematic review". *Journal of Clinical Periodontology* 40.5 (2013): 457-473.
16. Bajaj N and Tandon S. "The effect of Triphala and Chlorhexidine mouth wash on dental plaque, gingival inflammation and microbial growth". *International Journal of Ayurveda Research* 2.1 (2011): 29-36.
17. Boggess KA and Edelsen BL. "Oral health in women during preconception and pregnancy: Implications for birth outcomes and infantoral health". *Maternal and Child Health Journal* 10.S5 (2006): 169-174.

18. Guimaraes AN., *et al*. "Very low and low birth weight associated with maternal periodontitis". *Journal of Clinical Periodontology* 39.11 (2012): 1024-1031.
19. Waghmore AS., *et al*. "A clinical evaluation of the effect of 0.2% chlorhexidine gluconate as a mouthrinse on gingival inflammation in pregnant and non-pregnant women with and without undergoing scaling and root planing procedures". *Journal of the International Clinical Dental Research Organization* 3.1 (2011): 33-36.
20. Jaferzedeh H., *et al*. *Journal of Oral Science* 48.4 (2006): 167-175.
21. Eversole LR. Clinical outline of Oral Pathology, Diagnosis and Treatment.3rd edition. BCDecker, Hamilton 113-114.
22. Rateischak KH. "Tooth mobility changes in pregnancy". *Journal of Periodontal Research* 2.3 (1967): 199-206.
23. Pirie M., *et al*. "Dental manifestations of Pregnancy". *The Obstetrician and Gynecologist* 9.1 (2007): 21-26.
24. PachecoL., *et al*. Physiologic Changes during pregnancy. In Clinical Pharmacology during pregnancy Ed. Matinson DR. Editor (San Diego Academic Press) Elsevierb Inc. (2013): 5-16.
25. Andrade SE., *et al*. "Use of prescription medications with a potential for fetal harm among pregnant women". *Pharmacoepidemiology and Drug Safety* 15.8 (2006): 546-554.
26. Grahame Smith DG and Aaronson JK. Oxford Text Book of Clinical Pharmacology and Drug Therapy. (1992).
27. Nezevalova Henriksen K., *et al*. "Effects of ibuprofen, diclofenac, naproxen, and piroxicam on the course of pregnancy and pregnancy outcome: a prospective cohort study". *BJOJ* 120.8 (2013): 948-959.
28. Malaika Babb., *et al*. "Treating pain during pregnancy". *Canadian Family Physician* 56.1 (2010): 25-27.
29. Ruby Cross., *et al*. "Revisiting doxy cycline in Pregnancy and early childhood-time to rebuild it's reputation?" *Expert Opinion on Drug Safety* 15.3 (2016): 367-382.
30. Yefit E., *et al*. "The safely of Quinolonesin Pregnancy". *Obstetrica land Gynecological survey* 69.11 (2014): 681-694.
31. Koss AC., *et al*. "Investigation of Metronidazole Use during Pregnancy and Adverse Birth Outcomes". *Antimicrobial Agents and Chemotherapy* 56.9 (2012): 4800-4805.
32. Kueiyu Joshua LN., *et al*. "Safety of macrolides during pregnancy". *American Journal of Obstetrics & Gynecology* 208.3 (2013): 221e1-221e8.
33. Ji Min Lee and Teo Jeon Shin. "Use of local anaesthetics ford ental treatment during pregnancy; safety for partiurient". *Journal of Dental Anesthesia and Pain Medicine* 17.2 (2017): 81-90.
34. Mazze RI. "Nitrous oxide during pregnancy". *Anesthesia* 41.9 (1986): 897-899.
35. Douglas Wilson R. "Principles of Human Teratology: Drug, Chemical and Infections exposure". *Journal of Obstetrics and Gynaecology Canada* 29.11 (2007): 912-917.
36. Toppenberg KS., *et al*. "Safety of radiographic imaging during pregnancy". *American Family Physician Journal* 59.7 (1999): 1813-1818.
37. Mils L W and Moses DT. "Oral health during pregnancy". *MCN. The American Journal of Maternal Child Nursing* 27.5 (2002): 275-280.
38. Kurien S., *et al*. "Management of Pregnant Patient in Dentistry". *Journal of International Oral Health* 5.1 (2013): 88-97.
39. Fiesse R and Herzog S. "Issues in dental and surgical management of the pregnant patient". *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology* 65.3 (1988): 292-297.
40. Chandna P and Adalakha VK. "Oral health in children guidelines for paediatricians". *Indian Pediatrics* 47.4 (2010): 323-327.
41. Nowak AJ and Cassamassimo PS. "Using Anticipatory Guidanceto provide Early Dental Intervention". *The Journal of the American Dental Association* 126.8 (1995): 1156-1163.
42. Offenbacher S., "Periodontal infection as a possible risk factor for preterm low birth weight". *Journal of Periodontology* 67.S10 (1996): 1103-1113.
43. Offenbacher S., *et al*. "Potential pathogenic mechanisms of periodontitis associated pregnancy complications". *Annals of Periodontology* 3.1 (1998): 233-250.