Review Article

Oral health in pregnancy (Guidelines to gynaecologists, general physicians & oral health care providers)

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Abstract

Primary health care providers are in a unique position to treat the pregnant mothers for dental as well as general health for a healthy mother and child. Oral cavity is also subjected to reversible as well as irreversible changes due to hormonal changes during pregnancy. Perinatal mortality rates in Pakistan are more than 10-fold greater than in developed countries. It increased with the severity of periodontal disease.

Patients, physicians, and dentists are cautious, often avoiding treatment of oral health issues during pregnancy. This problem is compounded by a lack of clinical guidelines for the prevention and management of common oral conditions in pregnancy.

This article reviews the commonly occuring oral problems during pregnancy and their management, guidelines for prenatal counselling, dental procedures that can be carried out during pregnancy and preventive strategies that could be helpful in preventing the commonly occurring diseases such as dental caries and periodontal disease.

Keywords: Pregnancy, Periodontal disease, Preterm birth, Dental Caries, Anticipatory guidance.

Introduction

Pregnancy is a delicate condition involving complex physical and physiological changes. Pregnancy constitutes a special physiological state characterized by a series of temporary adaptive changes in body structure, as the result of an increased production of various hormones such as oestrogens, progesterone, gonadotropins, and relaxin. The oral cavity is also affected by such endocrine actions, and may present both transient and irreversible changes as well as modifications that are considered pathological.[1]

Pregnant women are particularly susceptible to gingival and periodontal disease. In this context, different oral lesions are reported to be common during pregnancy. In effect, an increased prevalence of dental alterations have also been documented, including particularly caries and erosions.[2] The biochemical and hormonal changes of pregnancy enhance the risk. Since the old wives' tale of "the loss of a tooth for every pregnancy," oral health during pregnancy has long been a focus of interest.[3]

Vergnes and Sixou,[4] in their systematic, a meta-analytic review of 17 articles concluded that there was a statistically significant association between periodontitis and adverse pregnancy outcomes. Perinatal mortality rates in Pakistan and many other developing countries are more than 10-fold greater than in developed countries. In a study on periodontal disease and adverse birth outcomes in pregnant Pakistani women, it was found that they have high levels of moderate-to-severe dental disease. It was concluded that stillbirth and neonatal and perinatal deaths increased with the severity of periodontal disease.[5]

Patients, physicians, and dentists are cautious, often avoiding treatment of oral health issues during pregnancy. This problem is compounded by a lack of clinical guidelines for the management of common oral conditions in pregnancy. In the absence of practice guidelines, fear of medico legal action based on negligent or substandard treatment of oral conditions during pregnancy abounds, but it is largely unfounded.[6] In addition to a lack of practice standards, barriers to dental care during pregnancy include inadequate dental insurance, persistent myths about the effects of pregnancy on dental health, and concerns for foetal safety during dental treatment.[7]

Commonly occurring oral problems during pregnancy

Oral lesions:

The oral cavity during pregnancy is exposed to gastric acid that leads to erosions in the teeth. The possible reasons could be that (i) in the first trimester, morning sickness is the common cause and (ii) in the later stages, a lax oesophageal sphincter and the upward pressure from the gravid uterus can exaggerate acid reflux. Patients with severe vomiting can present with severe forms of erosions on the enamel.

Rinsing the mouth with fluoride mouthwash or mixing baking soda with water or applying tooth mousse (casein phosphopeptide amorphous calcium phosphate) on the teeth after vomiting can neutralize acid. Expectant mother should be counselled not to brush their teeth immediately after vomiting. They should also be instructed to use soft or super soft (paediatric) tooth brush to avoid further damage to the gastric acid exposed enamel.

Dental Caries:

An increased prevalence of dental alterations has been documented, particularly caries (99.38%).[2] The reasons for the pregnant women at higher caries risk are as follows: (i) increased pH in the oral cavity due to frequent vomiting, (ii) expectant mothers have cravings towards sugary snacks and (iii) less attention towards oral health. Active dental caries if left untreated can lead to local as well as systemic complications.

If the mother (infecting person) has high salivary mutans streptococci count, transmission occurs through several daily saliva contacts between the child and the mother. The acquisition of mutans streptococci is suggested to occur during a discrete age interval: a "window of infectivity" between 19 and 31 months in which the proportion of children with MS increases from 25% to 75%.[8]

Pregnancy Oral Tumour:

Pyogenic granuloma (or pregnancy tumour) seems to be common in the gestating female population. Increased hormone (progesterone) levels along with bacteria and local irritants (calculus) are the major reason for such a growth to occur. It usually arises during the second trimester of pregnancy. The surface clinically appears as smooth, lobulated mass which is erythematous. Common site of occurrence is the gingiva. Other locations are the tongue, palate and the buccal mucosa. The tumour grows rapidly and usually recedes soon after delivery. Frequent monitoring is the first line of management unless the tumour presents itself with bleeding (interfering with mastication). The recurrence rate is high if the tumour is surgically excised during pregnancy.[9]

Loose (mobile) Teeth:

Due to increased levels of hormones such as progesterone and estrogen, which affects the periodontium (periodontal and gingival fibres and the alveolar bone), the teeth become loose even in the absence of gingival and periodontal infections.[1] In such instances, the Gynaecologists or the Physicians can assure the patients that it is a transient condition and would return to normal soon after delivery.[10]

Gingivitis:

Gingivitis is the most common oral disease in pregnancy in such situations. It is inflammation of the superficial gum tissue. During pregnancy, gingivitis is aggravated due to (i) increase in hormone (estrogen and progesterone) levels, (ii) alteration in oral flora and (iii) a decreased immune response, thus reducing the body's ability to repair and maintain healthy gingival tissue.[11] Frequent oral hygiene measures include individual practices such as regular tooth brushing, flossing and use of mouth washes and professional measures such as oral prophylaxis and oral irrigation can minimise the severity of gingivitis.

Periodontitis:

Periodontitis is a destructive inflammation of the periodontal apparatus affecting many women of childbearing age. The process begins with inflammation followed by bacterial infiltration into the periodontal fibres. Chronic inflammatory response is stimulated by the toxins released by the infiltrated bacteria resulting in break down and destruction of periodontium creating loss of attachment (pocket) which eventually gets infected. Finally, the tooth becomes mobile. This process can induce recurrent bacteraemia, which indirectly triggers the hepatic acute phase response, resulting in production of cytokines, prostaglandins (i.e., PGE2), and interleukins (i.e., IL-6, IL-8), all of which can affect pregnancy.[12]

Elevated levels of these inflammatory markers have been found in the amniotic fluid of women with periodontitis and preterm birth compared with healthy control patients.[13] In one study, researchers found minimal oral bacteria in the amniotic fluid and placenta of women with preterm labour and periodontitis.[14] It seems probable that this inflammatory cascade alone prematurely initiates labour due to early uterine contractions. The mechanism is thought to be similar for low birth weight; the release of PGE2 restricts placental blood flow and causes placental necrosis and resultant intrauterine growth restriction.[15]

Literature states that both poor nutrition and low birth weight are risk factors for the development of early childhood caries (ECC).[16] ECC is an early arising, potentially devastating and virulent form of dental caries. It not only causes decay, but results in pain leading to restlessness, infection and impairment of oral function such as mastication which leads to malnutrition and diminished quality of life. Under- or malnourished infants and infants with low birth weight are at risk for enamel hypoplasia of the permanent teeth (incomplete formation of enamel).[16] Enamel hypoplasia usually results in rough or irregular enamel surface with or without discoloration. These irregularities are more prone to dental caries.

Prenatal Counselling

Prenatal oral health counselling for parents is an important factor because infant oral health begins at this stage. The main goal is to create awareness among the expectant mothers about the importance of prevention of dental disease by means of oral prophylaxis and restoring carious teeth. These procedures will decrease the micro-organisms in the oral cavity of the mother thereby reducing transmission to the child.

Prenatal assessment begins with the oral health status of the expectant mother. If the expectant mothers are at risk, the

dentist should provide preventive treatment such as oral prophylaxis, fluoride varnish application and educate them on good plaque control, followed by restorations if required and discuss the transmissibility of Mutans streptococcus from the mother to the child. Regular recall visits are planned to ensure effective oral hygiene measures and compliance with dietary habits. Thus, improving the expectant mothers oral hygiene, modifying dietary habits and the use of mouthwashes can certainly have a significant impact on the child's oral health status, especially caries rate in the future.[17]

Anticipatory guidance:

Anticipatory guidance is the process of providing practical, developmentally appropriate information about children's health to prepare parents for the significant physical, emotional and psychological milestones. Anticipatory guidance involves three types of tasks: (i) gathering information, (ii) establishing a therapeutic alliance, and (iii) providing education and guidance. General anticipatory guidance for the mother includes the following.[18,19]

(a) Education concerning development and prevention of dental disease and also demonstration of oral hygiene procedures.

(b) Counselling to instil preventive attitudes and motivation.

(c) Educating the pregnant women about pregnancy gingivitis (an exaggerated response due to hormonal changes during pregnancy). The gingiva become oedematous, swollen and painful and tends to bleed profusely. It is evident at the second trimester and reaches its peak at the end of third trimester.

(d) Regular visit to a dentist for check-up, to reduce the gingivitis (pregnancy) and restoring all carious teeth as early as possible.

(e) Eating healthy foods containing proteins and vitamins such as fresh fruits and vegetables, grains and dairy products such as milk and cheese. From the dental perspective, the expectant mother should take adequate nutrition during the third trimester because the enamel (primary or milk teeth) maturation of the child occurs in that phase.

(f) Limiting the amount of sugar consumption, if at all taken, it should be taken along with the meals. The frequency of snacking (food rich in sugar increases the risk of tooth decay) in between meals is to be avoided.

(g) Brushing the teeth thoroughly thrice a day with fluoridated toothpaste and flossing daily.

(h) Rinsing the oral cavity with an alcohol-free mouthwash before going to bed (preferably a fluoridated mouth rinse).

(i) Not smoking cigarettes or chewing tobacco.

Dental procedures during pregnancy

Oral hygiene habits, oral problems such as dental caries and gingivitis and the access to oral care should be assessed for every pregnant woman.[10] Maintaining good oral health during pregnancy is important to the general health of both mothers and their babies.

Screening and Prevention:

Oral examination should include the soft tissue examination such as tongue, gingiva, buccal mucosa, palatal mucosa and hard tissue examination such as the dentition. Patients should be counselled (i) to perform regular brushing with soft bristles and flossing the inter-dental areas, (ii) to avoid frequent snacking (especially sugary snacks and carbonated drinks), and (iii) to have frequent dental check-up. The oral health status, treatment plan and follow-ups should be documented to evaluate the oral health maintenance. Many healthcare providers including the Dentists are often reluctant to treat the expectant mothers.[20] This situation can be overcome by multi-speciality discussions, through which a clear communication and a better understanding can be obtained. Dentists can explain various dental materials, procedures and safety of dental treatment to the Gynaecologists and the Physicians so that they can explain them to the pregnant mothers and provide referral recommendations.

Diagnosis:

Dental radiography (IOPA, Bite wing and Occlusal) can be performed during pregnancy for emergency purposes.[21] If it's possible, radiographs should be delayed till the second trimester. Radiographs taken for regular check-ups should be postponed until delivery. Use of lead aprons and thyroid shields, collimators, E-speed films, avoidance of retakes will reduce the risk of radiation exposure. The teratogenic risk of radiation exposure from intra-oral films is 1,000 times less than the natural risk of spontaneous abortion or malformation.[20]

Medications used during Dental procedures:

Local anaesthetic solutions such as lidocaine (Xylocaine) and prilocaine (Citanest) mixed with epinephrine are safe for procedures when dosed appropriately.[22] Sedatives such as benzodiazepines (e.g., midazolam), lorazepam (Ativan) and triazolam (Halcion) should be avoided. Use of Nitrous oxide during pregnancy is still not rated but its use is controversial.[23]

Periodontal Therapy:

There was a significant reduction of preterm birth or low birth weight children rate in a randomized controlled trial consisting of 870 pregnant women for whom dental treatment such as plaque control, scaling and daily rinsing using 0.12% chlorhexidine and maintenance therapy such as oral hygiene instructions and manually performed supragingival removal of plaque every 2 to 3 weeks until delivery were met.[24]

Restorative Dentistry:

Amalgam is the most commonly used restorative material in dentistry. It has advantages over other restorative materials since it is not technique sensitive; however, there are concerns about release of mercury as vapour that can possibly be ingested or inhaled. There is no published evidence that amalgam exposure during pregnancy have deleterious effect such as spontaneous abortions or birth defects.[25]

In a longitudinal evaluation of filling materials on caries-active expectant mothers, it was concluded that highly viscous glass ionomer cement can be a material of choice in minimally invasive cavity preparations and composite restorations can be used for anterior teeth.[26]

Dental Extraction:

Dental pain has become a common complaint during pregnancy. Due to the hormonal changes during pregnancy, the gingiva is sensitive to irritation. The gingiva gets inflamed, turns red, bleeds and becomes painful. Brushing is difficult which gives way for plaque accumulation around the teeth. This commonly occurs in the gingiva around the impacted third molar teeth. This could be the prime reason for extraction during pregnancy.

Most Dentists would wish to postpone dental extractions during pregnancy. There is a continuous stress when the expectant mother is in constant pain and this is not a healthy sign for the developing child. A dental extraction these days is painless, produces least stress and many patients are not even aware that their tooth had been extracted.

Root Canal Treatment:

Many expectant mothers are worried about the adverse outcomes of a root canal treatment to their foetus. Gynaecologists and Physicians usually prefer to avoid such radicular treatments during pregnancy preventing any danger to the foetus. Unfortunately, it is not the same to postpone a root canal treatment as it is to postpone a teeth whitening procedure.

In a tooth that is recommended for a root canal procedure, the risks are associated with:

Pain: Severe tooth pain due to inflammation is a common reason for root canal therapy. Persistent pain during pregnancy is a stressful condition which can have lack of sleep, restlessness and distress from toothache that may have negative outcomes to both the mother and the foetus.

Infection: Infection is another serious condition which can lead to significant danger for both the expectant mother and the foetus. If left untreated and is localized it can spread to surrounding spaces causing space infections and can end up spreading to the circulation causing septicaemia.

Management of Acute Dental conditions:

In conditions such as mild cellulitis, first-line antibiotics such as penicillin, amoxicillin, and cephalexin are the drugs of choice. In case of patients allergic to penicillin, erythromycin base (not erythromycin estolate, which is associated with cholestatic hepatitis in pregnancy) or clindamycin (Cleocin) can be used. In patients with severe cellulitis, the pregnant mother should be treated as an inpatient with intravenous infusion of cephalosporins or clindamycin. Acetaminophen is the drug of choice to relieve dental pain; ibuprofen and limited use of oxycodone are appropriate.[10]

Various types of dental procedures that can be undertaken during each trimester are summarized as follows:[18,19]

First trimester: It is the most crucial period for growth of the foetus. Only emergency dental treatment should be undertaken in consultation with the patient's Gynaecologist/Physician when organogenesis is incomplete. If the expectant mother complains of dental pain, the dentist can do an emergency access opening, extirpate the inflamed pulp (or) drain the pus and relieve pain. Intra-canal medicaments such as chlorhexidine/metronidazole, calcium hydroxide can be used. Plaque diet control programmes are initiated for the mother throughout pregnancy.

Second trimester: This phase is considered the most safest to treat patients among the three trimesters. Emergency as well as elective dental treatment can be provided in the second trimester. Treatment such as emergency dental extractions, periodontal surgeries, completion of root canal can be performed.

Third Trimester: If patient develops dental pain, an emergency treatment can be performed and definitive treatment can be postponed until after the birth, if possible. There is a positional discomfort in the third trimester and the risk of compression of the vena cava. This can be overcome by repositioning them frequently and propping on their left side and most importantly, reducing the timings of appointments can minimize complications.[27]

Postponing dental treatment until delivery can be problematic because mothers are more focused on the care of their newborn child than their own health and may not have dental insurance after delivery.[12]

Preventive Methods

Although a number of non-invasive preventive interventions, traditional health education is considered as the gold standard for imparting knowledge and encouraging parents on preventive interventions. "Traditional health education" is a means of conducting counselling sessions by health care providers and/or the dissemination of information

by means of pamphlets, posters and media campaigns. Unfortunately, these approaches were not effective.[28]

Weinstein & co workers, after two-year results of controlled trial suggested that motivational interviewing (MI) counselling had a positive effect on children's dental health and was found to have a greater effect than that of traditional health education.[29] The antimicrobial treatment (topical application of sodium fluoride (NaF) and iodine solution immediately after prophylaxis and 3 and 5 days later) for the pregnant mother, 6 and 12 months after delivery had greater influence by reducing the acquisition of MS from the mother to the children.[30]

Kohler et al[31] used chlorhexidine (CHX) in mothers with a high level of MS in saliva and found that there is a reduction in the MS level of saliva of the mother and also had a long-term effect on the MS colonization and also on the caries experience of the child. A 30 month study to evaluate the effectiveness of a caries preventive regime (0.05% sodium fluoride and 0.12% chlorhexidine mouth rinse everyday during 6 months of pregnancy till 24 months after delivery) showed promising results on using combination of fluoride and chlorhexidine.[32,33] Fluoride is the most widely known and accepted anti-caries agent available, and chlorhexidine is the most widely used plaque-inhibitory compound.[33] The mechanism of action of these two agents is completely different, and their combined administration produces a synergistic effect on mutans streptococci.[33]

Xylitol and chlorhexidine reduce maternal oral bacterial load and reduce the vertical transmission of bacteria to infants when used late in pregnancy and/or in the postpartum period. Both topical agents are safe in pregnancy and during breastfeeding.[34] Various dosing levels are used in studies and the results have been on the positive side but the optimal dose is still not clear. Xylitol chewing gums of high-dose had beneficial effects by reducing the plaque pH and on long term use of xylitol chewing gums; it was found that there was significant reduction in the plaque pH and MS saliva concentration.[35]

Conclusion

Dental treatment is an important aspect for good oral health that should extend even during pregnancy. Regular dental visit can include the use of x-rays, oral prophylaxis, restorations, interventional treatments like root canal treatments, periodontal surgeries and extractions because using local anaesthetics during pregnancy do not have any adverse effects to the developing foetus. Conversely, complications of pregnancy, such as preterm birth, low birth weight and preeclampsia, occur in women who had not received any dental treatment.

Nevertheless, pregnancy is a time when women may be more motivated to make healthy changes. Gynaecologists and Physicians can address maternal oral health issues, probably reducing the risk of adverse pregnancy outcomes through available preventive measures, early diagnosis, and appropriate management by referring to a Dentist.

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