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Coalition of Oral Health Care and Antenatal Counseling: Formulation of Guidelines

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Abstract

Human resource lies at the heart of economic and social development especially in developing countries. India has the largest youth population worldwide. Optimum economic development and demographic dividend can be achieved through investment in the health and education of this population starting at the grassroots levels such as antenatal health care. Previous studies have shown some antenatal oral conditions may have adverse consequences on the fetus. Oral health care during pregnancy is often avoided and misunderstood by healthcare professionals. Patients lacked awareness about the adverse outcomes of poor oral health on their pregnancy. Periodontitis is associated with preterm and infantile low birth weight. High level of cariogenic organisms in the oral cavity have been linked to higher incidences of caries in the infant .Other conditions like pregnancy gingivitis and pyogenic granuloma are benign and require oral prophylaxis, reassurance and regular monitoring. Dental procedures like diagnostic radiography, extractions, periodontal treatment, restorations are safe and best performed during the second trimester .Appropriate dental care during pregnancy can also prevent poor prenatal outcomes like gestational diabetes and preeclampsia. It is imperative to screen every expectant mother for oral lesions, receive comprehensive oral health education and dental treatment when necessary. It is evident that dental management during pregnancy still presents some deviations from scientific literature recommendations, indicating the need to update these health care professionals in order to establish guidelines for prenatal dental care.

Keywords *Oral health, Pregnancy, Ante-natal Counselling*

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I. Introduction

The economic and social development of any developing nation depends primarily on its human resources. As India is home to the world's largest youth population, it will be a major contributor to the global demographic transition. The population which is dependent now will transform to labour force in future. Hence nurturing them with proper education and health care should be a primary goal. Studies have demonstrated that overall health cannot be achieved without good oral health and hence improvising oral health has become a major public issue [1].

The infant mortality in our country was still 41/1000 live births in 2013[2]. Most of these babies are born pre-term or have low birth weight. Recent studies have shown that poor oral health is a leading cause of pre-term and Low Birth Weight (LBW) babies. Since the consequences of poor oral health can have a lifelong impact, pregnancy and early childhood are particularly important times to have access to oral health care and inculcate importance of oral hygiene [3].Concern for woman's health as a primary goal is another reason why oral health in pregnancy is of interest [4]. Pregnancy is a unique time in a woman's life and is characterised by complex changes in maternal anatomy, physiology and metabolism. Hormonal changes along with modification in diet can result in gingivitis, periodontitis , pregnancy tumors and increased risk of caries [4].Pregnancy is also an opportune time and a teachable moment to educate women about importance of oral hygiene and caries prevention.

Pregnant women are more likely to seek dental care if their gynaecologists recommend it during prenatal period [5]. Although most gynaecologists agree that the oral screening should be a part of prenatal care, they rarely refer their patients to dental care [5]. Studies demonstrated that oral cavities were never examined by 85.75% gynaecologists during routine examinations [5]. 98 % general practitioners felt that delay in dental treatment affect both child and mother [5]. Most pregnant women are generally healthy and need not be denied dental treatment solely because they are pregnant. However the adaptation of maternal physiology necessitates considerations and adjustments in the treatment by any dentist providing oral health care. Over estimation of risks, highcost, difficult access, cultural beliefs and myths are barriers to obtaining oral care [6].

The perceptions towards oral health during pregnancy need to be changed by different strategies like updating health curriculum, continuing education courses, training health care professionals to conduct oral screenings as a part of routine physical examination and make appropriate referrals, thus promoting inter disciplinary training in counselling patients about how to reduce risk factors common to oral and general health. Social media can effectively provide this message. This approach can play an important role in improving oral health of mother and child by increasing awareness [7].

II. Timing of Treatment

Treatment timing and planning plays a crucial role in managing a pregnant patient. Ideally

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dental surgeons must always communicate with patient's gynaecologist. Unless an emergency, treatment should be deferred during the first trimester, due to potential vulnerability of the foetus at this stage [8]. Organogenesis is completed by the end of first trimester, nausea has generally ceased and the uterine size is not increased to the extent that sitting in a dental chair is uncomfortable, hence the second trimester is considered to be an ideal time for planning of elective treatment to avoid problems that could arise later in the pregnancy or in the post-partum period [9]. Early third trimester is considered to be relatively a good period but in the later third trimester, decreased cardiac output along with decreased blood pressure can occur in supine position. Compression of the inferior vena cava by the gravid uterus is attributed to this phenomenon which is known as supine hypotensive syndrome. It is characterized by light-headedness, hypotension, tachycardia and syncope. To avoid this, patients must be positioned in left lateral decubitus position with right buttock and hip elevated 15 degrees and semi reclined dental chair. Extensive elective procedures should be postponed until after delivery [10]. Deferring required treatment could cause unforeseen harm to the maternal and fetal health for multiple reasons. Self-medication with over the counter analgesics can have precarious outcomes. Untreated caries increases the risk of transmission of carious organisms to infants and more importantly, the untreated oral infection can become systemic which can lead to multiple complications like pre-term and Low Birth Weight (LBW) deliveries.

III. Gingivitis

Gingivitis is defined as the inflammation of gingiva which surrounds the tooth and covers the alveolar bone [11]. According to the American Academy of Periodontology about 50% of the women experience pregnancy gingivitis [12]. Contrary to popular notion, pregnancy itself does not cause gingivitis and although gingivitis is generally plaque induced, interestingly increase in plaque does not cause pregnancy gingivitis [11]. The increased levels of estrogen and progesterone during pregnancy cause hyper vascularization of periodontium along with changes in collagen production and increased vascular permeability, thus making gingival tissue more susceptible to local irritants like bacterial biofilm or plaque [13]. Thus pregnancy only accentuates the body's natural response to plaque [6]. Gingivitis frequently appears in the second month of gestation and can worsen as the pregnancy progresses reaching its peak at the eighth month, is commonly associated with the anterior teeth and does not differ histologically from gingivitis in non-pregnant state [11].

IV. Pregnancy Epulis

It is also known as pregnancy tumour, granuloma gravidarum or pyogenic granuloma. It is a localized soft hyperplastic, red, nodular legion on the gingiva. It is usually pedunculated and although it can arise from any gingival site, it mostly occurs on interdental papillary gingiva particularly on the labial and buccal aspect of the upper jaw.

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http://www.ijogr.com/

Histologically and clinically it is indistinguishable from pyogenic granuloma in other conditions [11]. This exuberant growth of neo-capillaries is due to extensive endothelial and connective tissue proliferation caused by minor mechanical or plaque irritation. Most of these lesions regress postpartum without any medical intervention. Surgical removal should only be performed if the epulis is traumatised by opposing teeth or restorations causing pain and bleeding. However patient must be informed about risk of recurrence [14-15].

V. Periodontitis

Tooth mobility is most often a sign of periodontal disease but in pregnancy it may also be associated with the presence of a hormone called relaxin which helps in parturition [16]. Oral hygiene is closely associated with the prevalence of periodontal disease. Periodontal diseases are generally caused by gram-negative anaerobic bacteria which are capable of producing multiple inflammatory mediators like prostaglandins and interleukins. Studies suggest that the periodontal pathogens produce endotoxins that may gain entry into the blood; these increase the production of inflammatory mediators. These, in turn, increase the 'C' reactive proteins, ultimately stimulating prostaglandin E2. During pregnancy, the levels of prostaglandin reach their peak at the end of the gestational period .This surge of prostaglandins triggers labour at the end of the pregnancy but a sudden surge of prostaglandins due to periodontal infection may cross the placenta barrier and cause fetal toxicity resulting in preterm deliveries and low birth weight infants[17]. Low birth weight, defined as birth weight less than 2,500 g, continues to be a significant public health issue in both developed and developing countries[18]. Preterm delivery is one of the major causes of neonatal mortality and long-term neurological morbidity[19]. Premature and low-birth-weight (PLBW) infants are still 40 times more likely to die during the neonatal period [20]. Periodontitis can cause irritation of the uterine smooth muscles, and rupture of chorioamniotic membrane [5]. Endotoxins can cause oxidative stress and inflammation of placenta precipitating preeclampsia; it may also aggravate pre-existing preeclampsia. Periodontitis is a common sign of diabetes and recent studies have proven an association between periodontitis and gestational diabetes [21]. Periodontitis adversely affects blood glycemic levels thus increasing the likelihood of developing gestational diabetes. Hence all health care providers must educate and encourage pregnant women to improve and maintain their oral health with practices like brushing teeth twice daily with fluoridated tooth pastes and flossing daily.

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VI. Acid Erosion

Hyperemesis gravidarum is the term used for persistent nausea and vomiting during pregnancy. While over half of all pregnant women experience some form of morning sickness, only 1.5% to 2% suffer from hyperemesis gravidarum, a much more serious condition [22]. It is more common in the first trimester and though no exact cause is known, multiple phenomena contribute to it .They include high levels of hCG (human chorionic gonadotropin), increased estrogen levels, gastrointestinal changes like increased gastric acid production, displacement of organs to make space for the growing uterus which along with the incompetence of gastro-esophageal sphincter causes gastro esophageal reflux commonly termed as morning sickness. Changes in dietary habits and psychological factors also contribute to it [23]. Patients with acid reflux are at a greater risk of tooth erosion and periodontal problems. The pH of stomach acid is 2 or less and the enamel of the tooth begins to dissolve at a pH of 5.5. Day after day this exposure to the acid begins to thin and dissolve away the enamel exposing dentin which can cause hypersensitivity and also increased incidence of caries [24]. In such a situation the heath care provider must educate the patient to visit her dental care provider regularly, provide diet counseling to limit foods containing sugars to meal times only and to prefer fruits over juices. They should assist the pregnant women in dealing with nausea and vomiting by advising them to eat small amounts of nutritious yet non-cariogenic meals through the day. Patients should also be advised to not brush teeth immediately after vomiting and to rinse the mouth with baking soda and water mix to neutralize the acid .Gentle tooth brushing with fluoridated toothpaste and mouthwash can help remineralize teeth.

VII. Radiology

Though radiography in pregnancy is surrounded by a lot of myths and concerns, patients should be reassured that the dental staff will practise the ALARA(As Low As Reasonably Achievable)principle in all cases requiring imaging and that the radiographs will be taken only when absolutely necessary for diagnosis[25]. Modern dental X-rays expose the patient to minimal doses of radiation which is directed away from the uterus and the risk of "scatter" radiation that might reach the baby is extremely small and does not represent an increased risk for birth defects or miscarriage. Recommendations for Limiting Exposure toIonising [26]. Oral radiography is safe for pregnant patients as long as the dental team follows the basic guidelines for radiation exposure like the use of modern high speed films, a lead apron and a thyroid collar, digital X-rays use of long cone technique and above all preventing repeat exposures[27-28]. X-ray radiation exposure of up to 5-10cG resulted in no increase in congenital anomalies or intrauterine growth retardation [27]. Exposing an unborn baby to more than 10 rad has been shown to increase the risk of learning

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http://www.ijogr.com/

disabilities and eye problems. The amount of radiation that a baby would get if you had a dental X-ray is only 0.01 millirad. Since one rad is equal to 1,000 millirad,the patient would have to have 100,000 dental X-rays for the fetus to receive just one rad [29]. Even so, the foetus may be more susceptible to radiation between the 2nd and the 6th week due to organogenesis and rapid foetal growth rate and so diagnostic radiation maybe withheld during this period.

VIII. Drugs in Pregnancy

The various groups of drugs used in pregnancy are analgesics, antibiotics, local anesthetics, and sedatives. Another major concern of administration of drugs in pregnancy is that the drug will cross the placental barrier and cause teratogenic effects on the fetus. The US Food and Drug Administration(FDA) has defined categories of pregnancy risk associated with various drugs, and guidelines for safety prescribing drugs during pregnancy[30]. Analgesic drug categories are based on short term use (2-3 days) [31]. Paracetamol is the most popular and one of the safest drugs to be prescribed in pregnancy and lies in FDA category B. However due to the various strengths and preparations available, its potential for liver toxicity and the recent controversy of its use during lactation, it is important to instruct the patient on how to use the drug and its maximum allowed dosage no more than 4g/day for adults. Category C includes most of the other analgesics [32]. Some other analgesics are peculiar, Ibuprofen lies in FDA Category C in the 1st and 2nd trimester but FDA Category D in the 3rd trimester due to the risk of premature closure of ductus arteriosus and inhibition of labour [33]. Codeine and oxycodone are narcotics and prolonged use should be avoided in the 3rd trimester due to risk of depression of fetal respiration [34]. If the patient is a rapid metaboliser then codeine is rapidly converted to morphine which can be passed on to the infant through breast milk. Most antibiotics or antimicrobials that are prescribed in dentistry are classified in Category B[35]Beta-lactam antibiotics, semi-synthetic penicillin (amoxicillin and ampicillin) and cephalosporin were selected as first-choice drugs by nearly all professionals (95%) [6]. In case of allergy to penicillin, the drug of choice was cephalosporin which lies in category C [6]. Tetracycline and its derivatives like doxycycline are included in category D due to their adverse effects on developing teeth and bones. Chlorhexidine gluconate which is an antimicrobial mouthwash is classified in Category C. Local anesthetics like lidocaine and prilocaine lie in category B, along with bupivacaine, articaine, mepivacaine and even epinephrine [30], [36]. Nitrous oxide is not included in the FDA classification and its use during pregnancy is still controversial [37]. Fluoride is a category C drug. The use of fluoride in tooth pastes and mouthwashes is well established. Topical fluoride treatment is recommended especially if the patient is experiencing enamel erosion due to acid reflux [38]. The use of oral fluoride supplementation is still a controversy since fluoride was removed from the 20 prenatal vitamins by

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http://www.ijogr.com/

FDA in 1966 and it depends solely on the amount of fluoride present in the drinking water at that place [39].

IX. Conclusion

Timely and appropriate dental care with proper precautions can prevent many poor health outcomes for the mother and the foetus. Comprehensive and universally accepted guidelines that address the need of oral healthcare of pregnant women must be formulated for dental surgeons as well as gynaecologists and prenatal health care providers. These guidelines should include the following Accessibility of expectant mothers to vital information regarding the importance of good oral health and the serious outcomes of poor oral hygiene and untreated dental infections on their pregnancy, their health and on the health of the fetus. Awareness can be created by including importance of oral health and oral hygiene instructions in prenatal classes and pamphlets which can be made available in prenatal health care centers and hospitals. The use of diagnostic radiation must follow guidelines especially to limit foetal exposure to ionising radiation. Comprehensive oral examinations must be made mandatory as a part of routine prenatal examinations. The prenatal health care providers must refer patients to dental professionals whenever necessary. The use of standardised referral forms is recommended to help bring about better coordination among prenatal health care providers and dental surgeons. Conditions like Preeclampsia and gestational diabetes are challenging conditions but not contraindications to dental treatment .Pregnant patients must be educated and encouraged to meticulously maintain their oral hygiene by brushing 2 to 3 times a day with fluoridated toothpastes, flossing and also getting prophylactic dental treatments like scaling and polishing in every trimester. Finally before prescribing any drug, the risk-benefit ratio for the patient should be determined and the obstetrician should be consulted.

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