

# ORAL HEALTH STATUS AND TREATMENT NEEDS FOR PREGNANT WOMEN: A REVIEW

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## ABSTRACT:

Pregnancy is a special state for a woman, which is associated with a myriad of emotional and physiological changes in different parts of body including oral cavity and dental health. Thus the present review was undertaken to summarize the available information regarding oral health status and treatment needs of pregnant women in various parts, across the world and to discuss possible dental treatment needs during this period. The study was a systematic review of English-language articles indexed in PUBMED and GOOGLE SCHOLAR which was published from the year 2000-2015 with Medical subject heading (MeSH) terms linked with the maternal oral health like Pregnancy and Oral health etc. Of 179 citations, 11 studies met study criteria and were reviewed.

**Keywords:** Pregnancy, Oral health, Treatment needs.



## INTRODUCTION:

Pregnancy is a special state for a woman, which is associated with a myriad of emotional and physiological changes in different parts of the body including oral cavity and dental health.<sup>[1]</sup> The progressive physiological changes that occur during pregnancy are essential to support and protect the developing fetus and also to prepare the mother for parturition. Pregnancy involves complex hormonal interactions, which cause profound physiologic changes. The changes that occur are the result of increasing maternal and fetal requirements for the growth of the fetus and for the preparation of the mother for delivery. These increased hormonal secretion and fetal growth induce several systemic, as well as local physiologic

and physical changes in a pregnant woman.<sup>[2]</sup> The main systemic changes occur in the cardiovascular, hematologic, respiratory, renal, gastrointestinal, endocrine, and genitourinary systems.

Pregnancy is accompanied by changes in the oral cavity that affect the hard and soft tissues of the mouth.<sup>[3]</sup> Most pregnant women change their eating habits to more frequently eating foods rich in carbohydrates and acids. This situation is exacerbated by the decrease in salivary pH associated with frequent nausea and vomiting. Pregnant women who do not comply with regular and careful oral hygiene often suffer from erosions of tooth enamel and develop new dental caries.

Oral tissues are also known to be affected by pregnancy with the most frequent and greatest changes occurring in the gingival tissue.<sup>[4]</sup> They may be more susceptible to periodontal disease since higher concentrations of oestrogen and progesterone can induce hyperaemia, edema and bleeding in periodontal tissues, increasing the risk of bacterial infections. The incidence of periodontal disease has been positively correlated with lower educational achievement and lower socio-economic status.<sup>[5-7]</sup> In addition to gingival changes, the other manifestations associated with pregnancy include chloasma (bilateral brown patches in the midface), facial telangiectasia, sialorrhea, tooth surface loss usually related to vomiting when severe (hyperemesis gravidarum), increased mobility of teeth, changes in the severity of oral aphthae.<sup>[8]</sup>

The reasons for this likely changes are multi-factorial and include inadequate oral hygiene, limited access to oral health care, medical co-morbidities that increase oral disease risk, and limited knowledge of the relationship between oral and general health among prenatal care providers and their patients.<sup>[9,10]</sup>

Apart from the effects of hormonal changes, other factors such as HIV infection, lack of dental care, poor oral hygiene, smoking, low educational level, low employment status, increased age and ethnicity contribute to a worsened periodontal condition during pregnancy.<sup>[11,12]</sup>

Pregnant women with low health literacy also have less pregnancy-related knowledge

and poorer health behaviour.<sup>[13]</sup> Though studies were available in past literature regarding the oral health status of pregnant women, no such review were made. Hence the present review was undertaken to summarize the available information regarding oral health status and treatment needs of pregnant women in various parts, across the world and to discuss possible dental treatment needs during this period.

## **METHODS:**

A thorough literature review was made which engaged most of the articles published in peer reviewed journals relating to maternal oral health among various populations across the world. The review itself began with the search of relevant Medical subject heading (MeSH) terms like pregnancy, Oral health etc and non-MeSH terms like Treatment needs in various search engines including PUBMED, PUBMED CENTRAL & GOOGLE SCHOLAR. Articles published in English language only were included in the review. The spotlight of the present review will be oral health among pregnant women, and its dental management will be discussed. Articles published between the years 2000 to 2015 were only reviewed. Finally of 179 citations, 11 studies met study criteria and were reviewed.

## **DISCUSSION:**

Pregnancy is a dynamic physiological state which is evidenced by several transient changes. These can develop as various physical signs and symptoms that can affect the patients' health, perceptions and

interactions with others in the environment. The patients may not always understand the relevance of the adaptations of their bodies to the health of their fetuses. A gestational woman requires various levels of support throughout this time, such as medical monitoring or intervention, preventive care and physical and emotional assistance.

During pregnancy, the inflammatory response to the dental plaque is increased, leading to swollen gingiva, which tend to bleed on brushing. The gingivitis which is caused by the hormonal changes which occur in pregnancy is known as pregnancy gingivitis. It is considered to be the most common oral manifestation of pregnancy, as it has been reported to occur in up to 100% of the pregnant women. Pregnancy gingivitis becomes apparent in the second month of gestation and it worsens as the pregnancy progresses, before receiving a peak in the eighth month. In the last month of the gestation, the gingivitis usually decreases and immediately postpartum, the gingival tissues are found to be comparable to that of normal women.

Pregnant women are more susceptible to periodontal disease because of female reproductive hormonal influences. A few studies have demonstrated that periodontal disease may be associated with adverse pregnancy outcomes, such as premature birth and low birth weight.<sup>[25-26]</sup>

Sex steroid hormones have been shown to directly and indirectly exert influence on cellular proliferation, differentiation and growth in target tissues, including keratinocytes and fibroblasts in the

gingiva.<sup>[27]</sup> There are two theories for the actions of the hormones on these cells: a) Change of the effectiveness of the epithelial barrier to bacterial insult and b) Effect on collagen maintenance and repair.

Estradiol can induce cellular proliferation while depressing protein production in cultures of human pre-menopausal gingival fibroblasts. This cellular proliferation appears to be the result of a specific population of cells within the parent culture that responds to physiologic concentrations of estradiol.<sup>[28]</sup>

Sex steroid hormones have also been shown to increase the rate of folate metabolism in oral mucosa. Since folate is required for tissue maintenance, increased metabolism can deplete folate stores and inhibit tissue repair.<sup>[29]</sup>

As an independent risk factor for adverse pregnancy outcomes, periodontal disease is preventable and treatable. Controlling plaque by brushing, flossing and professional prophylaxis, including scaling and root planning, all help to achieve good dental health in pregnancy.<sup>[30]</sup>

Therefore, improving periodontal status before pregnancy in order to reduce the occurrence of adverse pregnancy outcomes would be of great importance for public health. And understanding the characteristic of periodontal status among women with childbearing age would play an important role in developing health strategies.

Teeth brushing, being the most important oral health behaviour, is still prohibited

during pregnancy for some people who hold the old Chinese superstition and gestation reaction such as vomiting would make women to reduce the brushing frequency and time. As a result, poor oral hygiene leads to the occurrence and development of periodontal disease. Therefore, it is essential to correct the misleading opinion and reinforce the consciousness of oral health behaviour among this population.<sup>[31]</sup>

Finally knowledge or awareness to sustain proper oral hygiene during pregnancy is very crucial for the wellbeing of the pregnant women. Studies have found that there was a definite lack of knowledge on the importance of maintaining oral care. Failure to attend a dentist on a regular basis and lack of understanding about the importance of maintaining oral hygiene may be a cause and it might be because some women simply cannot afford to maintain an adequate level of dental hygiene or regular dental visits. Educating and motivating women to maintain good oral hygiene and providing affordable dental health care is fundamental in reducing dental disease. Improving dental education may need to become a priority in antenatal care to educate women at risk of the importance of maintaining oral health.<sup>[32]</sup>

The dental management of pregnant patients requires special attention. Dentists, for example, may delay certain elective procedures so that they coincide with the periods of pregnancy which are devoted to maturation versus organogenesis. At other times, the dental

care professionals need to alter their normal pharmacological armamentarium to address the patients' needs versus the fetal demands. Applying the basics of preventive dentistry at the primary level will broaden the scope of the prenatal care. Dentists should encourage all the patients of the childbearing ages to seek oral health counselling and examinations as soon as they learn that they are pregnant.<sup>[33]</sup>

#### **For the first trimester (1-12 weeks)**

During the first trimester, it is recommended that the patients be scheduled to assess their current dental health, to inform them of the changes that they should expect during their pregnancies and to discuss on how to avoid maternal dental problems that may arise from these changes. It is not recommended that the procedures may be done at this time. The concern about doing procedures during the first trimester is twofold. First, the developing child is at a greatest risk which is posed by teratogens during organogenesis, and second, during the first trimester, it is known that as many as one in five pregnancies undergo spontaneous abortions. Dental procedures which are performed near the time of a spontaneous abortion may be assumed to be the cause, which lead to concerns for both the patient and the practitioner, as to whether this could have been avoided.<sup>[34]</sup>

#### **The current recommendations are**

1. To educate the patients about the maternal oral changes which occur during pregnancy.

2. To emphasize strict oral hygiene instructions and thereby, plaque control.
3. To limit the dental treatment to a periodontal prophylaxis and emergency treatments only.
4. To avoid routine radiographs. They should be used selectively and only whenever they are needed.

#### **For the second trimester (13-24 weeks)**

By the second trimester, the organogenesis is complete, and the risk to the fetus is low. The mother has also had time to adjust to her pregnancy, and the fetus has not grown to a potentially uncomfortable size that would make it difficult for the mother to remain still for long periods. The positioning of the pregnant patients is important, especially during the third trimester. As the uterus expands with the growing fetus and the placenta, it comes to lie directly over the inferior vena cava, the femoral vessels, and the aorta. If the mother is positioned supine for the procedures, the weight of the gravid uterus could apply enough pressure to impede a blood flow through these major vessels and to cause a condition which is called supine hypotension. In this condition, the blood pressure drops secondary to the impeded blood flow, which causes an- asyncopal or a near-syncopal episode. This situation is easily remedied by a proper positioning of the patient on her left side and elevating the head of the chair, to avoid compression of the major blood vessels. The dental practitioner should not hesitate to consult the patient's obstetrician, should any

question arise about the safety of a procedure, particularly if there are special circumstances which are associated with the pregnancy.<sup>[35]</sup>

#### **The current recommendations are:**

1. Oral hygiene, instructions and plaque control.
2. Scaling, polishing and curettage may be performed if they are necessary.
3. The control of active oral diseases, if any.
4. An elective dental care is safe
5. Avoid routine radiographs. Use selectively and when they are needed.

#### **For the third trimester (25-40 weeks)**

The fetal growth continues and the focus of the concern now, is the risk to the upcoming birth process and the safety and comfort of the pregnant woman (eg. the chair positioning and the avoidance of drugs that affect the bleeding time). It is safe to perform a routine dental treatment in the early part of the 3rd trimester, but from the middle of the 3rd trimester, routine dental treatments are avoided.

#### **The current recommendations are:**

1. Oral hygiene, instructions and plaque control.
2. Scaling, polishing and curettage may be performed if they are necessary.
3. Avoid an elective dental care during the 2nd half of the third trimester.

4. Avoid routine radiographs. Use selectively and when they are needed.<sup>[36]</sup>

## CONCLUSION:

Thus it was clearly evident that oral health status of pregnant women were poorer with more treatment needs, thus establishing a healthy oral environment and maintaining optimal oral hygiene levels

would promote their oral health status. Nevertheless, pregnancy is a time where women may be more motivated to make healthy changes. So gynaecologists and physicians can address maternal oral health issues, which would probably reduce the risk of adverse pregnancy outcomes through available preventive measures, early diagnosis, and appropriate management by referring to a dentist.

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**TABLES:****Table 1: Summary of articles published from 2000 - 2015**

Authors	Year	Study Place	Sample size	Clinical parameters	Significant finding
Agbelusi GA, Akinwande JA, Shutti YO <sup>[14]</sup>	2000	Nigeria	250	OHI-S CPITN	Increase in OHI-S scores 1 <sup>ST</sup> Trimester OHI-S – 0.72 2 <sup>ND</sup> Trimester OHI – S – 1.06 3 <sup>RD</sup> Trimester OHI – S – 1.06 DMF – 1.54 Treatment needs Amalgam restoration – 51.72% Extraction – 23.37% Partial denture – 16.38%
Rakchanok N, Amporn D, Yoshida Y, Harun-Or-Rashid M, Sakamoto J <sup>[15]</sup>	2010	Thailand	94	WHO assessment	Caries – 74% Gingivitis – 86.2%
Karunachandra NN, Perera IR, Fernando G <sup>[16]</sup>	2012	Srilanka	Rural - 459 Urban - 348	DMFT	Rural Mean DMFT – 5.4 ± 3 Urban Mean DMFT – 3.69 ± 3.62
Merglova V, Hecova H, Stehlikova J, Chaloupka <sup>[17]</sup>	2012	Czech Republic	142 81 – case 61- control	DMF CPITN PBI	Treatment need Case – 77% Control – 52%
Wandera M, Astrom AN, Okullo I and Tumwine JK <sup>[18]</sup>	2012	Eastern Uganda	<b>713</b>	OHI-S CPITN	Periodontal problems – 67% Poor oral hygiene - 12.1% Recent dental visit – 29.8 periodontal symptoms – 65%.
Kumar S, Tadakamadla J, Tibdewal H, Duraiswamy P, Kulkarni S <sup>[19]</sup>	2013	India, Udaipur	206	DMFT WHO assessment	Caries experience – 86% Mean caries experience in 1 <sup>st</sup> trimester – 3.59 Mean caries experience in 2 <sup>nd</sup> trimester – 3.59
Cornejo C et al <sup>[20]</sup>	2013		80	DMFT Gingival Index – Loe & Sillness	Gingivitis – 93.75% DMFT - 12.24 +/- 6.48 One Missing tooth – 73.3% Active caries lesion – 92.1% One filled tooth – 53.7%
Onigbinde O, Sorunke M, Braimoh M, Adeniyi A <sup>[21]</sup>	2014	Nigeria	415	OHI-S CPI	OHI – S – 1.26 ± 0.78 CPI – Women in second trimester had the highest calculus score, CPI code 2.
Amin R & Shetty p <sup>[22]</sup>	2014	India, Karnataka	153	OHI-S DMFT Russel's periodontal Index	OHI-S and Russel's periodontal index were found to be significantly higher in pregnant women when compared to non pregnant women
Chiga S et al <sup>[23]</sup>	2015	Japan	20,702	CPI	Periodontitis – 32%
Basha S, Shivalinga Swamy H, Noor Mohamed R <sup>[24]</sup>	2015	India, Karnataka	340	CPI	Periodontitis – 41.04% Periodontitis is an independent risk factor for poor pregnancy outcome