ORIGINAL RESEARCH PAPER

Volume-8 | Issue-1 | January-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ASSESSMENT OF KNOWLEDGE,AWARENESS AND ATTITUDE ABOUT PERIODONTAL HEALTH AMONG PREGNANT WOMEN IN AMC MET MEDICAL COLLEGE AND HOSPITAL AHMEDABAD - A QUESTIONNAIRE BASED SURVEY.

Periodontology

Dr. Ajay Kumar Chandana PG Part III, Department Of Periodontology AMC Dental College And Hospital ,khokhara Ahmedabad, India.

Dr. Bela Dave* Professor and HOD, Department Of Periodontology AMC Dental College And Hospital , Khokhara Ahmedabad, India. *Corresponding Author

Dr. Payal Purohit, PG Part III, Department Of Periodontology AMC Dental College And Hospital , Khokhara Ahmedabad, India.

Dr.Chandni Rathi PG Part III, Department Of Periodontology AMC Dental College And Hospital , Khokhara Ahmedabad, India.

ABSTRACT

Background: Pregnancy can influence gingival health and also the changes in the hormone level and promote inflammation without any changes in the plaque level termed as Pregnancy Gingivitis.

Aim and Objective: To assess and compare the level of knowledge, attitude, and Awareness of periodontal health among pregnant women.

Materials&Methods: Awareness of the relationship between oral health and pregnancy, demographics, oral health knowledge, oral hygiene, and dental visits during pregnancy and their willingness for treatment to be surveyed by self administered questionnaire from 150 pregnant females.The data was collected, summarized and statistically analyzed

Results: Knowledge,awareness and attitude regarding periodontal disease, and its effect on the pregnancy and birth outcome is very limited. use of interdental aids, extra care during pregnancy and about premature labour and low birth babies are correlated with periodontal oral health.

Conclusion: Most pregnant women need more information about oral health, and prevention of gingival and periodontal diseases.

KEYWORDS

Pregnancy,Periodontitis,Oral health.

INTRODUCTION:

Preterm birth is a major medical, social and economic problem, accounting for a large proportion of maternal and especially neonatal mortality, acute morbidity and long-term sequelae.[1,2] The normal gestation for humans, full term, is 40 weeks. Preterm or premature birth is usually defined as a gestational age of less than 37 weeks. The majority of preterm births are also low birth weight [LBW- less than 2500 g (upto and including 2499 g)]. The international definition of low birth weight adopted by the 29th World Health assembly in 1976 is a birth weight <2500 g. Birth weight <2500 g results in rapid increase in risk of infant mortality.

The gingival lesions frequently presents as a rapidly growing gingival mass that may bleed profusely when touched; based on histological features, it is a highly proliferative vascular lesion resembling granulation tissue are found in association with pregnancy are called pregnancy tumors_or granuloma gravidarum. (3, 4).

The increasing knowledge in several pertinent fields enables us to make a reappraisal of the focal infection concept. Three pathogenic sequences leading to focal infection are-

1. Metastatic infection due to transient bacteremia
2. Metastatic inflammation due to immunological injury
3. Metastatic injury due to microbial toxins.

Recently the impact of periodontal disease on adverse pregnancy outcome has received much attention. Pre-term low birth weight (PLBW) is encountered in most world communities at varying levels of prevalence. There is emerging interest and increasing amount of the evidence that support the inter-relationship between periodontitis and adverse pregnancy outcome.Growth in uterus is a balance between the genetic potential of each individual fetus and the maternal environment. The maintenance of a normal pregnancy for approximately nine months represents the balance of the maternal and fetal nutritional, hormonal, and immunological systems.

25% to 50% of PLBW deliveries occur without any known etiology, and there is increasing evidence that infection may play a significant role in pre- term delivery. The neonatal and long term health care cost of pre- term infants impose a considerable economic burden on individual families. Many risk factors have been proposed for pre-term rupture of membrane and preterm labor, including infection and inflammation.[5]

Both generalized infections, including viral respiratory infections, diarrhea and malaria, and more localized infections of the genital and urinary systems can affect the gestational length. Association between chorioamnionitis, infection of amniotic fluid and PLBW has been established.[6]

Gibbs in his review article provides an excellent outline of the possible association between infections and adverse pregnancy outcomes. The infection hypothesis suggest that during a subclinical infection, the micro-organisms and their lipopolysaccharides enter the uterine cavity during pregnancy by the ascending route from the lower genital tract or by the blood- borne route from a non-genital route, hence causing pre-term birth.[7]

It has been suggested that spontaneous pre-term labor is commonly associated with bacterial vaginosis, a vaginal condition characterized by a prevalence of anaerobes. Bacterial invasion of the choriodecidual space can activate the fetal membranes or trigger the maternal immune system to produce a variety of cytokines and growth factors.

This has been shown to be eliciting an inflammatory burden resulting in placental damage and distress and, hence fetal growth restriction. In addition the cascade of disordered cytokine response can lead to stimulation of prostaglandin synthesis and release of matrix metalloproteinases (MMPs), which account for the uterine contractions and membrane rupture respectively, leading to the induction of labour.[8]

Intrauterine Growth Restriction

Intrauterine Growth Restriction (IUGR) refers to insufficient fetal growth diagnosed either by direct intrauterine growth assessment (ultrasonography) or insufficient fetal growth in length. It is not a disease entity, but a manifestation of several possible maternal and fetal disorders. Risk factors involving the fetus include chromosomal abnormalities, multifactorial congenital malformations, multiple gestations and fetal infections. In a recent animal study, results suggested that challenge with an oral pathogen Campylobacter rectus (C. rectus) in a mouse chamber model showed significantly more growth restricted fetuses in a challenged groups than the controls.[9]

Historical, Experimental and Epidemiological Evidence

In the early 1990s Offenbacher et al. hypothesized that oral infection, such as periodontitis, could represent a significant source of both

infection and inflammation during pregnancy.[10]

They noted that periodontal disease is a gram-negative anaerobic infection, which may lead to bacteremia and induce pregnancy complication. In a series of landmark animal studies, they demonstrated that in a hamster chamber model, chronic exposure to Porphyromonas gingivalis led to 15% to 18% decrease in fetal weights along with a local increase of PGE2 and TNF-α within the chamber fluid.

Later they studied the association between infection and pregnancy by inducing periodontal disease in the hamster model. These animal studies provided vital proof-of-principle experiments and suggested the possibility that low-grade oral infections may trigger off maternal-fetal inflammation and result in adverse pregnancy events. In subsequent landmark human study, Offenbacher et al. showed that periodontitis was a significant risk factor for PLBW.[11]

Different risk factors associated with Preterm Low Birth Weight (PLBW)

1. Mother's age:

In a study conducted by *Harlkow et al*, mothers between 20 and 34 years do not play a major role in the occurrence of preterm labor, which is an ideal period of reproduction and child bearing except for various genital and extra genital infections.[12]

2. Prenatal Care:

As concluded by *Dasanayake*, less prenatal care among mothers approached statistical significance.[13]

3. Anemia:

Murphy et al. reported that anemia during pregnancy was a potent risk factor for PLBW.

4. Education:

Davenport et al reported that increasing levels of education was statistically associated with a decreased risk for PLBW.[14]

MATERIALS AND METHODS:

SELECTION CRITERIA

1.Inclusion criteria:

All the Pregnant women in AMC MET Medical college & Hospital OBGY department are included.

2. Exclusion criteria:

All the patients were excluded who are not pregnant, Who did not given written consent.

Patient with smoking, Systemic disease ,Complicated pregnancy were excluded.

PROCEDURE:

The proposed study was conducted in OBGY department of AMC MET Medical college and Hospital Ahmedabad, Gujarat. The purpose of the study and the procedure for oral examination was explain to patients, And study was validated.

Principle investigator was select the sample. Purpose of the study was explained to participating patients. Information sheet was given to the participants and Informed consent was taken.Questionnaire form was given to participant and was asked to submit within 10 minute. Group of participants were identified , participants Questionnaire was given for oral hygiene habit (Good/Poor), knowledge, awareness and attitude about pregnancy and periodontal disease and systemic correlation.

Participants information contained questions on their socio-demographic characteristics such as age, address, occupation, monthly income and educational status. Fifteen questions pertaining number 1 to 5 regarding knowledge, 6-10 regarding awareness and 11-15 regarding attitude of relationship between oral health and pregnancy.

Participants were divided into 3 groups. 50 participants in Each group, included of first trimester, second trimester and third trimester respectively. Collected data were entered in micro excel sheet to prepare master chart and excel sheet and statistical analysis was done by statistician.

STATISTICAL METHOD:

A sample size of 150 achieves 80% power to detect an effect size (W) of 0.25 using a 2 degrees of freedom Chi-Square Test with a significance level (alpha) of 0.05000. Statistical Analysis: Statistical Analysis between groups using Chi Square Test at 5% level of significance by SPSS 20.0 Validated questionnaire result is 84.75% for this study.

Questionnaire:

Name: _____
Date:_____
Age: _____
OPD No:_____
Address: _____
Occupation of head of the family_____
Education: _____
Monthly income of family _____
Total score □
socioeconomic class: _____

1) What is your Gestation age ?
1st trimester □
2nd trimester □
3rd trimester □

2) which number pregnancy is this ?
A) First□ B) second□ C) third □

3) Do you know that extra care of oral hygiene is needed during pregnancy?
A) Yes □ B) No□

4) Are you aware that periodontal disease and pregnancy are related ?
A) Yes □ B) No□

5) Are you aware that periodontal disease can cause premature labor and low birth weight babies?
A) Yes □ B) No□

6) When you have visit a dentist ?
A) Every 6 Months□ B)Every Year □ c)When need arise □.

7) Have you visited a dentist during pregnancy?
A) Yes □ B) No□

If yes,
A) Referred by medico□ B) Adviced by non –medico□ C) Self decision □

8) Do you know that during Pregnancy your gums bleed, swell and become red?
A) Yes □ B) No□

9) What do you use for clean your teeth?
A)Brush□ B) Datun□ C) Finger□ D) Any other □

10) How often do you clean your teeth each day?
A) Once □ B) Twice □ C) thrice □

11) Do you use a mouthwash ?
A) Yes □ B) No□

12) If yes, how often each day ?
A) once□ B) twice □ C) thrice □ D) more □

13) Do you use any interdental cleaning aids?
A) Yes □ B) No□

14) If you have periodontal disease (gum disease) during pregnancy ,will you undergo for oral check up?
A) Yes □ B) No□

15) If you are permitted will you go for periodontal treatment ?
A) Yes □ B) No□

RESULTS:

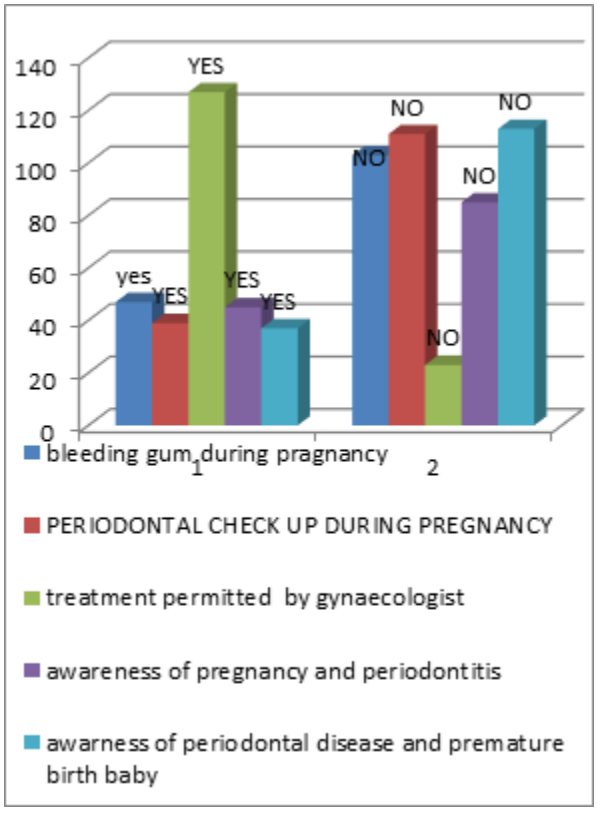
Socio demographic data: Educational level:

Age group(years)	n %	Number
≤25	20	30
26–30	33.33	50
31–35	33.33	50
>35	13.33	20

Primary school or lower	60(40)%
Secondary school	40(26.66)%
Diploma	30(20)%
University degree or higher	20(13.33)%

Distribution of responses to questions by periodontal health and awareness level during pregnancy :

Questions	First trimester of pregnancy	Second trimester of pregnancy	Third trimester of pregnancy	Total number (n)%
1) What is your Gestation age ? 1st trimester□ 2nd trimester □ 3rd trimester.□	50(33.33%)	50 (33.33%)	50(33.33%)	150 (100%)
3)Do you know that extra care of oral hygiene is needed during pregnancy? A) Yes □ B) No□	35(70%) 15(30)	40 (80)% 10(20%)	37(74)'% 13(26)%	112(74.26)% 38(25.33)%
4) When you have visit a dentist ? A) Every 6 Months□ B)Every Year □ c)When need arise □.	28(56)% 22(44)%	30(60)% 20(40)%	27(54)% 23(46)%	85(56.66)% 65(43.34)%



DISCUSSION:

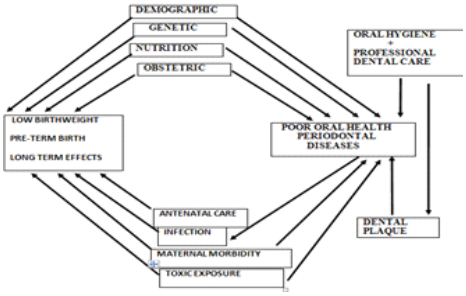
In this study Table 1,2 shows that 20% of pregnant women were aged >25 years or less, 33.33% between 26-30 ,33.33% between 31-35,13.33% were more than 35 years.

As study results shows more patients were educated primary school level is around 40% ,secondary school 26.66% ,diploma 20% and university degree or higher 13.33% respectively.

In this study A majority of the pregnant women has good knowledge and information about general health. But they have limited knowledge and awareness regarding periodontal disease, and its effect on the pregnancy and adverse pregnancy outcomes. Most pregnant women need more information about oral health, and prevention of gingival and periodontal diseases. [18,19]

studies are needed to assess the long-term effect of oral health education programs in maternity care centers on dental health knowledge and behavior of pregnant women. Long term studies are required to determine if there is a strong correlation between periodontal disease and premature labor. Also further studies are required to check whether periodontal therapy or prevention can reduce the risk of premature labor.

Interactions between risk factors and low birthweight



The biological plausibility of the association between periodontal disease and adverse pregnancy outcome can be identified and further strengthened by host responses to such an exposure.

The interaction between prostaglandins and cytokines are important mediators that influence both normal and abnormal pregnancy and delivery. There is strong evidence that suggests the disturbances in the physiological balance and production of these intrauterine mediators may affect the pregnancy outcome.These mediators can also be produced within the diseased periodontal environment, escape into the systemic circulation and possibly to the maternal-placental compartment.

These changes will affect the normal homoeostasis and balance of the maternal-fetal nutritional, hormonal, and immunological systems. In a study the level of PGE2 within the gingival crevicular fluid was found to be significantly higher in PLBW mothers as compared to normal birth weight controls.[17]In another study it was demonstrated that women who were diagnosed of threatened premature labor revealed poorer periodontal conditions and elevated serum IL-8 and IL-1β levels compared to the control women.In a recent study it was concluded that oral health instructions and periodontal treatment may decrease the infection of periodontal pathogens and reduce the risk of PLBW.These studies suggest a clear cut relationship between the infectious diseases such as periodontitis leading to an inflammatory burden to the host and resulting in the pregnancy complications as described.

Impact of periodontal infections on pregnancy outcomes:

Within the context of epidemiological studies on this subject, periodontal disease should be viewed as an exposure, and its assessment should capture information that is relevant to the infectious / inflammatory burden to which the patient is exposed. Most studies have used assessments of historical periodontal damage such as probing depth or clinical attachment loss, or an epidemiological index such as the Community Periodontal Index of Treatment Needs [(20).]

Unfortunately, none of these assessments were designed to measure

the infectious / inflammatory burden associated with periodontal infections. At present, there is no widespread consensus on the best case definition of periodontal disease to be used in studies that are designed to examine the impact of periodontal infections on general health outcomes. This problem is most certainly one of the major reasons for the variability and inconsistency in the results of studies dealing with the effect of periodontal infections on pregnancy outcomes. Indeed, when 14 published case definitions of periodontitis were applied to a single data set, it was found that use of six of the 14 definitions resulted in statistically significant odds ratios for certain adverse pregnancy outcomes. In other words, the significance of the association between periodontitis and pregnancy outcomes appears to depend in part on the definition of periodontal disease used. [21]

The presence of infection, particularly in the cervical area of the uterus, increases the risk of delivering a pre-term low-birth-weight baby. [22,23] If periodontitis is a cause of adverse pregnancy outcomes, it may be as a reservoir for hematogenous spread of oral bacteria and inflammatory mediators to the fetal–maternal unit. A suggested mechanism is 165 Relationship between pregnancy and periodontal disease that endotoxin from gram-negative bacteria enters the circulation at high enough levels to stimulate production of inflammatory mediators, such as prostaglandin E2, by the amnion.[24] Prostaglandin E2 and other inflammatory mediators are potent inducers of labor. Other direct effects of periodontal bacteria on the fetal–maternal unit are also likely. For example, it has been shown that periodontal pathogens (or their antigens) such as C. rectus, P. intermedia, F. nucleatum, P. micra, P. gingivalis, T. forsythia, T. denticola and P. nigrescens cross the placenta and reach the developing fetus in high enough levels to stimulate the fetus to produce IgM antibody against these bacteria. [25,26]. Importantly, significantly higher titers of fetal IgM against C. rectus and P. intermedia were found in the cord blood from pre-term compared to term babies (27). It is now clear that the fetus can be exposed in utero to antigens from a wide range of oral bacteria. Infection of amniotic fluid by oral microorganisms has been shown to be a possible complication of pregnancy as well as the probable cause of some cases of pre-term birth. Among these bacteria are Streptococcus spp, F. nucleatum , E. corrodens and P. gingivalis . It is noteworthy that elevated subgingival levels of P. gingivalis, T. forsythia, P. intermedia and P. Nigrescens have been detected in the oral microbiota during pregnancy, as this may increase the chances of their hematogenous translocation to the amnion (28). Direct evidence of oral–utero transmission within an individual has been shown using culture-independent molecular methods (i.e. 16S and 23S rRNA sequences). In a case report, a Bergeyella species with identical rRNA sequences was detected in subgingival dental plaque and the amniotic fluid of a woman who delivered a 1 lb 7 oz infant after 24 weeks of gestation. The mother had premature contractions, and test results indicated intrauterine infection despite lack of detection of bacteria in the amniotic fluid using culture methods. The Bergeyella species could not be detected in the vaginal tract, suggesting a possible hematogenous route of infection (29). The finding of an association between very preterm birth and the presence of an oral microorganism (i.e. Bergeyella) that can only be detected by cultureindependent methods (70) raises the possibility that other not-yet-cultivable oral bacteria may be important in the etiology of pre-term birth. The recent finding of the role of microbial biofilms in intraamniotic infections adds another level of complexity to the microbial pathogenesis of these infections (30).

Intrauterine access of bacteria to the developing baby also appears to retard fetal growth, as mothers with moderate to severe periodontitis tend to deliver babies that are small for their gestational age . Intrauterine access of C. rectus to the fetus may be particularly important, as it has been shown in mice that this microorganism causes growth restriction (31,32), including impaired neurological development . In the murine model, intrauterine growth restriction induced by C. rectus infection is associated with hypermethylation of fetal DNA. Epigenetic modifications such as this can have profound effects on fetal development. Increased levels of C. rectus have been detected in the oral microbiota during pregnancy (33).

CONCLUSION

A majority of the pregnant women had good knowledge and information about general health. But they have limited knowledge, awareness and attitude regarding periodontal disease, and its effect on the pregnancy and adverse pregnancy outcomes. Most pregnant women need more information about oral health, and prevention of gingival and periodontal diseases. Longitudinal studies are needed to assess the long-term effect of oral health education programs in maternity care centers on dental health knowledge and behavior of pregnant women. Long term studies are required to determine if there is a strong correlation between periodontal disease and premature labor. Also further studies are required to check whether periodontal therapy or prevention can reduce the risk of premature labor. Studies to assess the role of dental hygienists in designing and promoting information regarding periodontal health awareness and practices amongst pregnant women.

Limitation

This study was conducted in only 150 pregnant women of one hospital. The study should be done on larger sample size and in multiple centres.

Scope of study

1 similar studies in multicentric and multicity hospitals and maternity care centres should be conducted.
2 continuing education programs for pregnant women in all PHC,CHC health centres and hospital should be conducted.
3. Health instructional programs that motivate healthful dental habits among pregnant women should be intensified at all hospital.
4 Educate and encourage women for periodontal disease correlations with pregnancy and its outcomes.

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