

Assessment of the Knowledge of the Association between Periodontal Status and Pregnancy Outcome among Obstetricians and Gynecologists

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ABSTRACT

Background: It has been more than two decades since a link was found between maternal oral health and adverse pregnancy outcome. Obstetricians and gynecologists play a core role in the screening, prevention and referral of the pregnant women for periodontal diseases. Thus, a study was conducted to assess the knowledge of the association between periodontal status and pregnancy outcomes.

Methods: An online survey was done by distributing self-administered questionnaire to the obstetricians and gynecologists. The survey consisted of three parts: demographic variables, consent and questionnaire. The qualitative data was recorded and analyzed.

Results: Out of 237 participants, 95.8% of the participants agreed that there is a relation between periodontal disease and pregnancy; 73.8% with preterm birth, 60.3% with low birth weight infants and 38.4% with pre-eclampsia.

Conclusions: The knowledge of the association between periodontal status and pregnancy outcomes was found to be insufficient. The gynecologists must be provided with periodic orientation to enhance and update their knowledge on maternal periodontal health.

Keywords: Adverse pregnancy outcomes; gynecologists; periodontal diseases; pregnancy.

INTRODUCTION

Worldwide, in all population groups, birth weight is the most important determinant of the chances of an infant for healthy survival, growth and development.¹ The relation between periodontitis and adverse birth outcomes has been heavily researched.² The first study to report a link between maternal periodontal health and adverse pregnancy outcomes was done by Offenbacher et al.³ They also reported a seven-fold increased risk of delivery of a preterm low birth weight infant.³ It is important to know whether the obstetricians and gynecologists relate the role of periodontitis in the maternal and child health and whether referral is adequate or not.

Obstetricians and gynecologists are in a unique position to treat the pregnant mothers for dental and general health. This study aims to find out the knowledge among gynecologists about the association between periodontal disease and adverse pregnancy outcomes.

METHODS

A cross sectional study was done among 237 Obstetricians and Gynecologists who were registered in the Nepal Medical Council and voluntarily wanted to participate in the study from May 2021 to October 2021. Ethical clearance was taken from Nepal Health Research Council.

The sampling method used was convenience sampling. A semi-structured and self-administered questionnaire was distributed to the gynecologists through online platforms. There were three parts of the survey. The first part of the questionnaire gave information about the research and enquired about the demographic variables of the participants. Age, sex, institute, Nepal Medical Council registration number, years of experience and mode of practice were asked. The second part of the survey was a request for the consent of the participant. The participants who declined the consent were automatically discontinued and those who

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accepted were entered into the third part. The third part consisted of 16 dichotomous questions related to dentistry. The filled online forms were then documented and evaluated. The reliability of the questionnaire was examined by asking the pilot sample to attend the questions on two separate days 15 days apart. The questionnaire was modified as per the suggestion of the pilot sample. The acceptability of the questionnaire was tested by asking the pilot sample about their view on the questions.

Qualitative data were presented as frequencies and percentages. The statistical analyses were performed using Statistical Package for Social Sciences (SPSS) software program for Windows version 20.0.

RESULTS

Among the 237 participants, half of them (50.6%) were from the age group 30 to 39 years; 58.2% were females and 41.8% were males. More than half of the participants were in government practice (51.8%) and involved temporarily in their institutes (54%) (Table 1).

Table 1. Characteristics of the study population.

Characteristics	N (%)
Age	
<30	31(13.1)
30-39	120 (50.6)
40-49	60 (25.3)
50-59	19 (8.1)
>60	7 (2.9)
Gender	
Male	99 (41.8)
Female	138 (58.2)
Practice	
Government	121(51.1)
Private	88 (37.1)
Others(Semi-government)	28 (11.8)
Type of service	
Permanent	109 (46)
Temporary	128 (54)
Years of service	
<5	89 (37.5)
5-10	80 (33.8)
>10	68 (28.7)

More than 90% of the participants agreed that there is an association between gum disease and pregnancy. The

percentage of participants who agreed that pregnancy is linked to preterm birth and low birth weight infants were 73.8% and 60.3% respectively. In the study, 63.7% agreed that during pregnancy dental X-ray can be done whereas 46.4% agreed that oral procedures can be done by laser. More than 90% of the participants referred the pregnant females to dentists and periodontists in case of any gum problem (Table 2).

Table 2. Responses of Obstetricians and Gynecologists.

Questions	N (%)	
	Yes	No
Do you know there is association between gum diseases and pregnancy?	227(95.8)	10(4.2)
Do you think pregnancy increases the tendency for the gums to bleed?	184(77.6)	53(22.4)
Do pregnant women complain of looseness of teeth than other female patients during pregnancy?	134(56.5)	103(43.5)
Do pregnant women complain of swelling or any unusual growth in the gums?	179(76.2)	58(23.8)
Do you agree that gum infections during pregnancy is linked to preterm birth?	175(73.8)	62(26.2)
Do you agree that gum infections during pregnancy is linked to low birth weight infants?	143(60.3)	94(39.7)
Do you agree that gum infections during pregnancy is linked to pre-eclampsia?	91(38.4)	146(61.6)
Can dental treatment be carried out during pregnancy?	115(48.5)	122(51.5)
Can dental treatment be carried out in first trimester?	67(28.3)	170(71.7)
Can dental treatment be carried out in second trimester?	173(73)	64(27)
Can dental treatment be carried out in third trimester?	84(35.4)	153(64.6)
Can dental radiographs be taken during pregnancy?	151(63.7)	86(36.3)
Can LASER be used in the oral cavity during pregnancy?	110(46.4)	127(53.6)
Do you refer the pregnant females to the dentist if they complaint of gum disease?	226(95.3)	11(4.7)
Do you refer the pregnant females to the periodontist if they complaint of gum disease?	217(91.5)	20(8.5)
Do you agree that dental checkup should be integrated in prenatal program?	233(98.3)	4(1.7)

DISCUSSION

In the periodontium, gingiva is most commonly affected by pregnancy. Estrogen and progesterone receptors are present in gingival tissues and show changes in response to the hormonal fluctuations during pregnancy. Among the pregnant women, 60-75% suffer from pregnancy gingivitis.^{4,5} Gingivitis typically exacerbates during the second and third trimester, decreases during the ninth month of pregnancy, and usually resolves after parturition.⁶⁻⁹ In the survey, maximum (95.8%) of the participants agreed that there is a relation between periodontal disease and pregnancy. This percentage was seen to be higher in comparison to other studies. In a study done by Gupta et al, 79.3% of the medical doctors agreed on a possible connection between health of teeth and gums and pregnancy.¹⁰ In another study done by Satyanarayana in India, 79.4% of participants estimated the possible connection between the health of the teeth, gum, and pregnancy.¹¹

Increase in bleeding gums, loosening of tooth and swelling or unusual growth during pregnancy were agreed upon by 77.6%, 56.5% and 76.2% of the participants in the study. In a survey done in Nepal among medical practitioners, 76.4% were of the opinion that pregnancy increases the tendency for the gums to bleed, swell or be red.¹⁰ During pregnancy, the level of female sex hormone increases significantly. The level of progesterone reaches 10 times the peak luteal phase of menses and the level of estrogen reaches levels that are 30 times higher than during the reproductive cycle.¹² The estrogen and progesterone receptors are found in the human periodontium.¹³ These hormones alter the condition of gingival tissue which results in gingival inflammation.¹⁴ A tumor-like growth, called pyogenic granuloma is found in 0.2%-9.6% of pregnant women. The swelling is benign, soft, red, vascular, localized, tender, hyperplastic, and nodular in nature and found in the gingiva.¹²

Among the participants, 73.8% agreed that pregnancy is associated with preterm birth, 60.3% agreed that pregnancy is associated with low birth weight infants and 38.4% agreed that pregnancy is associated with pre-eclampsia. The finding is higher than observed in another study where only 37.7%, 41.6% and 11.7% medical practitioners agreed on the association between preterm delivery, low-birth weight and preeclampsia respectively.¹⁰ In another study done in India, 83% of the gynecologists believed the periodontal disease can lead to preterm labor and/or low birth weight.¹¹ In a study done by Wilder et al. in 2007 in North Carolina among 55 obstetricians, 84% obstetricians reported

periodontal disease to be a significant factor for adverse pregnancy events.¹⁵ Zanata et al. in Brazil conducted a study in 2008 among seventy-nine obstetricians where twenty-seven professionals (34.2%) were unaware of the possible correlation between periodontal disease and risk of premature labor.¹⁶ In a study done by Strafford et al, the percentage of obstetricians reporting premature delivery was 84%, low birth weight was 65%, premature rupture was 54% and pre-eclampsia was 11%.¹⁷

Gingivitis and periodontitis possibly are independent risk factors for preterm low birth weight.¹⁸ Although a causal link between periodontal disease and adverse pregnancy outcomes has not been established, there is a positive association between periodontal disease and preterm birth, low birth weight, and other adverse pregnancy outcomes.² There are two mechanisms that explain the possible link between periodontal disease and adverse pregnancy outcomes. According to the direct pathway, periodontal bacteria spread to the fetoplacental unit by bacteremia. According to the indirect pathway, proinflammatory mediators secreted from inflammatory cells in the periodontal region are carried to the fetoplacental unit, where they then cause an inflammatory response.²

In a proposed biological pathway associating periodontal disease and adverse pregnancy outcomes, periodontal disease induced inflammatory mediators may cause infection of fetoplacental unit by production of acute phase reactants from maternal liver.² This may lead to: damaged placental architecture resulting in low birth weight and preeclampsia; uterine contractility and cervical ripening resulting in preterm birth and impaired organ development resulting in perinatal mortality.²

In the study, only 48.5% of the participants responded that dental treatment can be carried out during pregnancy. The result is higher than in another study done by Al-Habashneh et al¹⁹ in Jordan in 2008 where among 197 medical doctors, 88% advised their patients to delay dental treatment until after pregnancy. But when compared to a study in Nepal, the result is lower. In a study done by Gupta et al¹⁰, 87.8% of the participants agreed that basic dental treatment is safe during pregnancy. Dental treatments during pregnancy are safe²⁰ but often delayed treatment is advised because many doctors still believe that they are risky and unsafe.¹⁰ 73% of the total participants agreed that dental treatment should be done in the second trimester whereas 71.7% and 64.6% said that it should not be done in the first and the third trimester respectively. The first trimester should be avoided as it is the stage of organogenesis. In the third trimester, chances of postural hypotensive

syndrome must be considered.²¹

In the survey, 63.7% agreed that dental X-ray can be done during pregnancy and 46.4% agreed that Laser procedures can be done in the oral cavity. The teratogenic risk of radiation exposure by dental radiography is very less than that of spontaneous abortion or malformation.²² The radiation can be further decreased by lead gowns, fast films, well-calibrated instruments and collimator.²³ Laser treatment is more comfortable to the pregnant patients.²³

In the study, 95.3% of the participant referred the pregnant females to the dentist if they complained of gum disease. 91.5% referred the pregnant females to the periodontist if they complained of gum disease. The ideal number of dental examinations is two in the first trimester, one in the second and one in the third trimester.²³ Maximum number of participants (98.3%) agreed that dental checkup should be integrated in prenatal program. This is very high in comparison to another study where only 64% of the obstetricians felt that pregnant patients should receive oral health screens as a part of prenatal care.¹⁷

The knowledge of the association between periodontal status and pregnancy outcomes among gynecologists in the study is comparative to other studies.^{10,16} In a study done in Nepal by Gupta et al, medical doctors had inadequate information on the impact of poor maternal oral health.¹⁰ Many doctors were uncertain about the safety of dental procedures and were hesitant in referring pregnant women to dental specialists. The authors stated that this could be due to lack of education or training in oral care during pregnancy.¹⁰ In a study done by Patil et al. in India in 2013 among 36 gynecologists, 38.8% gynecologists reported lack of knowledge and 7.7% reported lack of time regarding outcomes of poor oral health.²⁴

The limitation of the study is that the study was only conducted among gynecologists. Inclusion of medical doctors, general practitioners and antenatal care providers is recommended as many pregnant patients are attended by them.

CONCLUSIONS

The knowledge of the association between periodontal status and pregnancy outcomes among obstetricians and gynecologists in the study was found to be insufficient. Since the pregnant women show periodontal manifestations, it is important to be acquainted with details of pregnant oral health changes. Basic

periodontal knowledge should be emphasized by various interdisciplinary symposia, lectures, conferences and continuing medical and dental education programs.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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