Original Article

Evaluation of Obstetricians' Knowledge and Practice Behaviour Concerning Periodontal Disease as a Potential Risk Factor for Preterm Delivery and Low Birth Weight in North Gujarat

Deepa Patel[1], Charu Agrawal[2], Hiral Parikh[3], Shilpa Patil[4], Shilpa Duseja[4], Mishal Shah[5]

[1]Senior Lecturer, [2]Professor, [3]Professor and Head, [4]Reader, [5]Senior Lecturer, Department of Periodontology, Narsinhbhai Patel Dental College and Hospital, Visnagar, Gujarat, India

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ABSTRACT

Introduction: Maternal periodontal infection has been recognized as a risk factor for preterm and low birth weight infants. So, the aim of study was to assess the knowledge and attitudes of practicing obstetricians about the relationship between oral health and pregnancy outcomes, as well as their practice behaviour regarding oral healthcare in pregnant women in North Gujarat.

Methodology: A random, cross-sectional study in a population of practicing obstetricians from North Gujarat was carried out. Ninety practicing obstetricians gave consent to join the study. Data was collected in questionnaire format from the subject population. Collected data was statistically analyzed. Chi-square test with Yates correction was used to analyze the data. "p" value of <0.01 was taken as significant.

Results: 73.3% of the obstetricians said that their patients complained of bleeding gums, swelling and mobility. 58.3% of the obstetricians were aware that gum diseases occur at a higher rate in pregnant females. 38.3% of the obstetricians were aware that periodontal diseases can affect the outcome of delivery.

Conclusion: This study found that although obstetricians were knowledgeable about dental care practices during pregnancy and the relationship between oral health and pregnancy outcomes, this knowledge often did not translate into appropriate practice behavior.

Keywords: Awareness, obstetrician, pregnancy, periodontitis, preterm low birth weight.

INTRODUCTION

Periodontitis can be considered a continuous pathogenic and inflammatory challenge at a systemic level. The prevalence of periodontal disease increases with age. According to recent data, the prevalence is 57%, 67.7%, 89.6%, 79.9% in the age groups 12, 15, 35-44, and 65-74 years, respectively.[1]

There is a growing body of knowledge that supports an association between oral health and pregnancy outcomes.[2] Changes in hormonal levels (estrogens and progesterone) during pregnancy can lead to an inflammatory response and increased permeability of blood vessels, thus causing gingivitis and periodontitis.[3,4] Preterm delivery and low birth weight are the most common causes for neonatal morbidity and mortality.[5] A preterm delivery (PTD) is an infant born less than 37 completed week's gestation.[6] A low birth weight (LBW) infant is an infant born weighing less than 2500 grams.[7] The highest rates of low birth weight babies are reported from Asia and the incidence in India is quite high at about 20%.[8]

The relationship regarding the association between periodontitis and pregnancy outcomes is important to understand by health care professionals as they play a significant role in promoting the health care practices in pregnant women. Therefore, the preventive aspect of periodontal treatment should be inculcated before pregnancy so as to decrease the chances of pre-term low birth weight.[9]

In 1996, Offenbacher et al[10] first reported an association between periodontal disease and preterm delivery. Many studies, systematic reviews, and meta-analyses have since assessed the role of periodontal disease in causing adverse pregnancy outcomes and the findings have generally been supported.[10-12] There is limited data available on

obstetricians' knowledge, attitudes, and practice behaviors regarding oral health care during pregnancy. Wilder et al[13] in USA found that obstetricians know the possible association between periodontal disease and adverse pregnancy outcomes, but they did not apply this knowledge in their practice. Similar results were reported by Morgan et al[14] and Neves et al.[15]

A study evaluated obstetricians' knowledge and attitudes regarding oral health care during pregnancy and similarly observed that their knowledge is limited and is not consistent with established guidelines.[16] To date, all studies in this context have been carried out in the developed world and paradoxically, no study has been conducted in developing countries where the incidence of prematurity and low birth weight is high.

Therefore, this study was conducted with the purpose to assess the knowledge and attitudes of practicing obstetricians about the relationship between oral health and pregnancy outcomes, as well as their practice behaviors regarding oral healthcare in pregnant women in North Gujarat.

METHODS

This was a cross-sectional study in a population of practicing obstetricians from Mehsana and Patan district of North Gujarat. A total of 90 obstetricians, 45 each from Mehsana and Patan took part in the study. The study was approved by the ethical committee of Narsinhbhai Patel Dental College and Hospital, Visnagar, India. The data were collected based on a self-structured closed-ended questionnaire format. A non-dental person approached the obstetricians individually and distributed the questionnaires by hand after obtaining their consent to lessen the chances of bias. Their confidentiality was assured. The questions were answered immediately in 7-10 minutes and handed over to the investigator.

Questionnaire design

Survey questionnaire was designed to include demographic variables, knowledge variables, attitude variables and practice behavior variables. The survey questionnaire had twenty five questions (Table 1). The survey questionnaire was filled by all the subjects who took part in the study. Questions 1-7 assessed the personal information of obstetricians. Questions 10, 11, 18, 20-22 assessed the awareness of the subjects about the current inter-relationship and their willingness to update themselves with the latest advances. Questions 12-17 assessed the clinical approach of the subjects in diagnosis and treatment planning. Question 23 assessed the oral changes occurring during pregnancy; question 24 assessed the risk factors that may contribute to preterm birth or low birth weight and Question 25th assessed the frequency of referrals made by the obstetricians to the dentists in patients having dental problems in pregnant patients also focusing on their nutrition, lactation and genetic screening.

All returned questionnaires were coded and analysed. Results were analyzed using SPSS statistical tool. Chi-square test with Yates correction was used to analyze the data. "p" value of <0.01 was taken as significant.

RESULTS

A total of 90 obstetricians, 45 each from Mehsana and Patan, took part in the survey. The results obtained are summarized in tables 2, 3, and 4. Among this, 66% were male; the mean age was 46 years, and 44% had been practicing for more than 15 years. All 90 obstetricians had private practices. On an average, obstetrician in Mehsana and Patan saw 15 and 21 patients daily and 7 and 5 cases of PLBW per month, respectively (numerical values rounded off to the nearest whole number).

A total of 88 obstetricians were aware of periodontal disease, of which 49 noticed some kind of gum disease in their patients. 51 obstetricians said that their patients regularly complained of bleeding gums, small swellings, and mobile teeth, and 49 of them referred their patients to an oral health care professional. 47 obstetricians were aware that periodontal diseases occur at a higher rate in pregnant females, but only 39 of them made their patients aware of such relationship. 40 obstetricians were aware that periodontal disease could affect the outcome of delivery. Only 33 had come across this relationship in their journals, newsletters, or during CMEs, and none of the 90 obstetricians who took part in the survey had ever worked or presented on this relationship (Table 2).

Table 3 presents the knowledge of obstetricians regarding dental problems during pregnancy and risk factors for preterm birth or low birth weight. A high percentage of obstetricians reported that situations such as excess decay

Table 1: Self-Structured Closed-ended-Questionnaire

Date:

1. Anonyms:
2. **Age** (years): ☐ 26–35 ☐ 36-45 ☐ 46–60 ☐ >60
3. **Gender:** ☐ Male ☐ Female
4. **Type of service:** ☐ Public ☐ Private ☐ Teaching institute
5. **Location of practice:** ☐ Urban ☐ Rural
6. **Years in practice:** ☐ 0-2 ☐ 2–5 ☐ 5–10 ☐ >10
7. **No. of patients seen each day-** /Day
8. **No. of PLBW patients seen per month-** /Day
9. **Are you aware of periodontal (gum) diseases?** Yes/No
10. **If yes, what is the source of this information ?**
11. **Have you ever noticed periodontal (gum) diseases in your patients?** Yes/No
12. **If yes, what are their symptoms?**
13. **Have your patients ever mentioned any bleeding gums, small swellings, or tooth mobility during the period of pregnancy?** Yes/No
14. **Are you aware of the fact that periodontal (gum) diseases occur at a higher rate in pregnant females?** Yes/No
15. **How far you noticing that periodontal disease is occurring in pregnant woman?**
    (a) one in five (b) one in ten
16. **If yes, do you make your patients aware of this relation?** Yes/No
17. **At which period you are noticing bleeding gums?**

1st trimester	2nd trimester	3rd trimester

18. **Are you referring patient to the dentist after noticing bleeding gums?** Yes/No
19. **Are you aware of the fact that periodontal (gum) diseases could affect the outcome of delivery?** Yes/No
20. **Have you ever come across any articles about this relationship in your journals, newsletters or during your CMEs?** Yes/No
21. **Have you ever worked/presented on this relationship?** Yes/No
22. **How certain are you that the following changes occur or become worse during pregnancy?**

	Definitely happens	May happen	Uncertain Probably	Doesn't happen	Definitely doesn't happen
Excess decay of teeth					
Swollen gums					
Bleeding gums					
Tooth loss					

23. **How certain are you that each of the following is a risk factor that may contribute to preterm birth or low birth weight?**

	Definite risk	Possible risk	Uncertain	Probably no risk	Definitely no risk
Maternal smoking					
Bacterial vaginosis					
Periodontal disease					
Preeclampsia					

24. In your practice, which of the following do you recommend during prenatal care?

	Always	Occasionally	Usually	Rarely	Never
Lactation consultation					
Childbirth classes					
Nutrition consultation					
Dental examination					
Genetic screening					

25. In your practice, would you make a referral if the patient had concerns about the following issues? Frequency of referral.

	Always	Occasionally	Usually	Rarely	Handle myself
Nutrition					
Dental Health					
Childbirth techniques					
Lactation					
Genetic screening					

Table 2: Opinion of the respondents who took part in the study

Questions asked	Mehsana		Patan		p value	Total (%)	
	Yes	No	Yes	No		Yes	No
Are you aware of periodontal (gum) diseases?	44	1	44	1	1.0	96.6	3.3
Have you ever noticed periodontal (gum) diseases in your patients?	22	22	27	18	0.295	41.6	58.3
Have your patients ever mentioned any bleeding gums, small swellings, or tooth mobility during their period of pregnancy?	33	12	18	27	0.381	73.3	26.6
Have you ever referred any of your patients to an oral health care professional for complaints of bleeding gums, swellings, etc.?	26	19	23	22	0.792	60	40
Are you aware of the fact that periodontal (gum) diseases occur at a higher rate in pregnant females?	23	22	24	21	1.0	58.3	41.6
If yes, do you make your patients aware of this relation?	25	20	14	31	0.104	35	65
Are you aware of the fact that periodontal (gum) diseases could affect the outcome of delivery?	19	26	21	24	1.0	38.3	61.6
Have you ever come across any articles about this relationship in your journals, newsletters, or during your CMEs?	19	26	14	31	0.398	30	70

of teeth, gingival swelling and bleeding gums, tooth loss definitely happen during pregnancy (more than 14%, 39%, 24%, and 2%, respectively).

In the present study over 96% of participants were identified with smoking, bacterial vaginosis more than 76%, periodontal disease more than 60%, and preeclampsia more than 95% as risk factors for preterm birth or low birth weight (Table 4).

Table 5 describes the frequency with which obstetricians recommend guidance on breast feeding, classes on childbirth, nutritional consultations, dental examinations, and genetic tests for their patients during prenatal care, even if they had not been concerned with these situations. Over 44% of participants always recommend dental examination. Table 6 describes more than 88% obstetricians referring patient for dental health.

Table 3: Obstetricians' knowledge about dental problems and risk factors related to preterm birth or low birth weight. How certain are you that the following changes occur or become worse during pregnancy?

	Definitely happens		May happen		Uncertain Probably		Doesn't happen		Definitely doesn't happen	
Excess decay of teeth	M	P	M	P	M	P	M	P	M	P
	6 (14.4%)	6 (14.4%)	25 (58.1%)	25 (58.1%)	5 (11.7%)	5 (11.7%)	4 (10.8%)	4 (10.8%)	2 (4.9%)	2 (4.9%)
Swollen gums	18 (39.1%)	18 (39.1%)	24 (54.6%)	24 (54.6%)	1 (2.0%)	1 (2.0%)	2 (2.4%)	2 (2.4%)	0 (0%)	0 (0%)
Bleeding gums	11 (24.8%)	11 (24.8%)	29 (68.5%)	29 (68.5%)	1 (2.0%)	1 (2.0%)	2 (2.4%)	2 (2.4%)	1 (2.0%)	1 (2.0%)
Tooth loss	1 (2.0%)	1 (2.0%)	19 (42.4%)	19 (42.4%)	7 (15.0%)	7 (15.0%)	12 (27.2%)	12 (27.2%)	6 (12.2%)	6 (12.2%)

Table 4: How certain are you that each of the following is a risk factor that may contribute to preterm birth or low birth weight?

	Definitely happens		May happen		Uncertain Probably		Doesn't happen		Definitely doesn't happen	
	M	P	M	P	M	P	M	P	M	P
Maternal smoking	43 (96.8%)	43 (96.8%)	2 (3.2%)	2 (3.2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Bacterial vaginosis	33 (76.5%)	33 (76.5%)	8 (19.2%)	8 (19.2%)	0 (0%)	0 (0%)	1 (2.3%)	1 (2.3%)	0 (0%)	0 (0%)
Periodontal disease	27 (60.9%)	27 (60.9%)	10 (22.2%)	10 (22.2%)	6 (13.7%)	6 (13.7%)	1 (2.3%)	1 (2.3%)	0 (0%)	0 (0%)
Preeclampsia	42 (95.5%)	42 (95.5%)	3 (4.4%)	3 (4.4%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

DISCUSSION

Most of the private obstetricians in this study correctly knew that pregnancy could be associated with swollen and bleeding gums as well as excessive tooth decay. Only a few knew that tooth loss can occur in pregnancy. Pregnancy has been shown to exacerbate periodontal and gingival problems due to the effect of hormones and to changes in immunity.[17] Most obstetricians believed that pregnancy does not lead to tooth loss, which is contrary to the experience by Al-Habashneh.[18] Preterm birth and low birth weight are the significant causes for neonatal morbidity and mortality.[11, 19] A review summarized that it is impossible to draw definite conclusions in this area, even though some studies have reported positive associations between maternal poorer periodontal status and adverse pregnancy outcomes, especially preterm birth, low birth weight, and pre-eclampsia.[11] In the present study, most obstetricians had good knowledge of the effects of oral health on pregnancy outcomes. These findings are similar to the studies conducted by Wilder et al[13] and Mariano da Rocha et al.[20] Various authorities in the West recommend routine dental care and have generated guidelines for appropriate dental treatment during pregnancy.[21,22]

When it came to putting their knowledge into practice, only 40% of this study's obstetricians advised routine dental visits during pregnancy, and only 47% advised their patients about oral hygiene during antenatal period. Most stated that they referred to a dentist in case of dental pain, which is appropriate. Various studies have indicated that physicians do not look into the mouth of pregnant women due to lack of training and because busy obstetricians have no time to look into patients' mouths.[23, 24] In our study there was no correlation between obstetricians' number of years of practice experience and their knowledge of dental health

Table 5: Obstetricians' attitudes about dental problems and risk factors for preterm birth or low birth weight. In your practice, which of the following do you recommend during prenatal care?

	Always		Occasionally		Usually		Rarely		Never	
	M	**P**	M	P	M	P	M	P	M	P
Lactation consultation	42 (95.7%)	42 (95.7%)	3 (3.6%)	3 (3.6%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Childbirth classes	27 (60.6%)	27 (60.6%)	12 (26.7%)	12 (26.7%)	6 (12.7%)	6 (12.7%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Nutrition consultation	27 (60.6%)	27 (60.6%)	14 (28.3%)	14 (28.3%)	4 (9.4%)	4 (9.4%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Dental examination	19 (44.4%)	19 (44.4%)	12 (23.6%)	12 (23.6%)	6 (13.5%)	6 (13.5%)	5 (10.3%)	5 (10.3%)	3 (4.5%)	3 (4.5%)
Genetic screening	2 (3.2%)	2 (3.2%)	12 (23.6%)	12 (23.6%)	9 (20.9%)	9 (20.9%)	20 (45.6%)	20 (45.6%)	2 (3.2%)	2 (3.2%)

and pregnancy and their stated likelihood of making routine referrals of pregnant patients for dental examinations. In contrast, there was a significant correlation between obstetricians' knowledge of the effects of pregnancy on oral health and knowledge of the effects of oral health and pregnancy with their routine referral of pregnant patients to a dentist.

A recent comprehensive overview of 23 systematic reviews found strong evidence between periodontal disease and various adverse pregnancy outcomes. An advantage of doing a systematic review is that it generally has lower risk of bias thus providing a strong evidence.[25] This review indicates that periodontal disease in pregnant females contributes to overall risks of preterm births, low birth weight and preeclampsia. These findings highlight the relevance of periodontal disease at a global platform as well as an urgent need to identify the underlying causative mechanisms and develop preventive strategies accordingly.

This study found that although obstetricians generally had good knowledge about appropriate dental care practices during pregnancy as well as the relationship between oral health and pregnancy outcomes; many did not apply this knowledge in their own care of patients. Excluding any self-reporting bias that the obstetricians might have shown, these findings indicate that most obstetricians have a positive attitude about oral health and its relationship with pregnancy outcome. While most feel that joint consultations with dentists before oral interventions are a good thing, not many are of the opinion that they are absolutely necessary.

Limitations of this study are related to sample size. Larger number of sample size provides more precise result regarding the awareness.

Table 6: In your practice, would you make a referral if the patient had concerns about the following issues? Frequency of referral

	Always		Occasionally		Usually		Rarely		Never	
	M	**P**	M	P	M	P	M	P	M	P
Nutrition	30 (68.2%)	30 (68.2%)	8 (18.7%)	8 (18.7%)	3 (7.0%)	3 (7.0%)	0 (0%)	0 (0%)	2 (5.2%)	2 (5.2%)
Dental Health	39 (88.2%)	39 (88.2%)	4 (8.7%)	4 (8.7%)	1 (2.1%)	1 (2.1%)	1 (2.1%)	1 (2.1%)	0 (0%)	0 (0%)
Child-birth techniques	18 (39.7%)	18 (39.7%)	7 (15.7%)	7 (15.7%)	2 (4.3%)	2 (4.3%)	1 (2.6%)	1 (2.6%)	17 (37.8%)	17 (37.8%)
Lactation	24 (52.9%)	24 (52.9%)	4 (8.6%)	4 (8.6%)	2 (4.3%)	2 (4.3%)	0 (0%)	0 (0%)	15 (33.1%)	15 (33.1%)
Genetic screening	16 (34.9%)	16 (34.9%)	12 (25.6%)	12 (25.6%)	7 (15.7%)	7 (15.7%)	9 (21.1%)	9 (21.1%)	2 (4.3%)	2 (4.3%)

CONCLUSION

This study finds that obstetricians have adequate knowledge about the relationship of periodontal health and pregnancy outcomes but there is a gap between their knowledge and practice. Dentists' curriculum should include the appropriate care of oral health and do's and don'ts during pregnancy. Oral health care should be made an integral part of the obstetric examination in antenatal clinics and timely referrals to a dental specialist should be made to lower risks of abnormal pregnancy outcomes. Practicing obstetricians can be given in-service training on appropriate oral health care during pregnancy.

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Corresponding Author

Dr Deepa Patel, Department of Periodontology, N.P.D.C.H, Visnagar, Gujarat, India.

email: dr.deepa2891@gmail.com