ORIGINAL ARTICLE

KNOWLEDGE OF PERIODONTAL DISEASE IN EXPECTING MOTHERS AND ITS ASSOCIATION WITH UTILIZATION OF DENTAL SERVICES IN RIYADH, SAUDI ARABIA

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ABSTRACT

The aim of this cross-sectional study was to determine the knowledge of pregnant women in Riyadh, Saudi Arabia about possible association between periodontal disease and pre-term birth and baby's low birth weight and; its effect on the utilization of dental services during pregnancy. Four hundred and forty six pregnant women from two governmental hospitals in Riyadh, Saud Arabia completed a self-administered questionnaire. The questionnaire obtained information on demographics, oral health practices, satisfaction with oral health, current dental needs, and frequency of dental visit before and during pregnancy. Also, knowledge of pregnant women on the effect of periodontal disease on pregnancy outcomes was assessed. Only 30% and 21% of responding pregnant women indicated that they have visited the dentist in the 6-month before pregnancy and during pregnancy, respectively. Most pregnant women did not know that there might be an association between periodontal disease and pre-term birth (369/405) and baby's low-birth weight (365/412). Pregnant women who thought that periodontal disease may be associated with adverse pregnancy outcomes were 2.53 times more likely to seek dental treatment during pregnancy compared to those who did not know about it (95% CI: 1.42- 4.50). The results have indicated that knowledge about possible association between periodontal disease and adverse pregnancy outcomes was correlated to increased utilization of dental services during pregnancy.

Key Words: *Periodontal Disease, Expecting Mothers, Utilization, Dental Services, Saudi Arabia.*

INTRODUCTION

Pregnancy is associated with several physical and physiological changes, believed to be related to hormonal changes during pregnancy.[1] Increased level of gingival inflammation is one of these changes during pregnancy.[2] It has been reported that the increase in levels of sex hormones (estrogen and progesterone) may lead to increase vascular permeability and decrease host immunity and hence may predispose gingival tissues to inflammation.[3,4] Different reports indicate that the incidence of gingival inflammation among pregnant women is significantly higher than non-pregnant women.[2-4] These gingival changes are, however, limited and reversible if adequate oral hygiene is maintained.[3] Due to higher risk for development of gingival inflammation during pregnancy, it has been recommended that dental examination and appropriate professional dental hygiene care are performed at least once during pregnancy.[5]

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Some of the available literature suggests that there is a possible association between periodontal disease (PD) and various pregnancy adverse outcomes (PAO). Early studies have found that PD may contribute to higher risk for pre-term birth, and that pregnant women with higher level of PD are more likely to give birth to low weight babies.[6-10] It is believed that inflammatory mediators such as prostaglandins and interleukins produced in reaction to bacteria present in dental plaque in diseased periodontal pockets, are responsible for inducing preterm birth.[9,11,12] Additional support to this hypothesis came from some other studies which showed that periodontal therapy during pregnancy may significantly reduce the rates of preterm birth.[8,13] On the other hand, several other studies have reported non-significant association between PD and PAO.[14-16] The disagreement whether there is an association between PD and APO can be explained by the difficulty in assessing PD and the fact that there are many confounding factors that cannot be easily controlled.

Females are known to use dental and health services more than males.[17,18] However, majority of the women do not visit dentists during pregnancy.[19-24] Improved

oral health has been known to be correlated with better access to dental care.[25,26] Several studies have found that pregnant women may have a limited knowledge about the possible association between PD and APO.[27-29] Al Habashneh et al (2005)[27] reported that more than half of sampled mothers who had given birth in Iowa, United States were unaware of the possible association between oral health and pregnancy outcomes. In addition, Fadavi et al (2009)[28] found that African-American and Hispanic-American pregnant adolescents had few dental visits and low knowledge about the possible association between PD and pregnancy outcomes. Little is known about the knowledge of pregnant women in Saudi Arabia regarding the possible association between PD and APO. Therefore, the aim of the present study was to determine the knowledge of pregnant women in Riyadh, Saudi Arabia about the possible association between PD with pre-term birth and baby's low birth weight. The study also aimed to examine the influence of such knowledge on the utilization of dental services during pregnancy.

METHODOLOGY

Study Population

This cross-sectional study was conducted after receiving an approval from research ethics committee of College of Dentistry Research Center - King Saud University in Riyadh, Saudi Arabia. The target study population was pregnant women attending obstetrics and gynecology clinics in two government hospitals; King Khalid University Hospital (KKUH) and Prince Sultan Military Medical City (PSMMC) in Riyadh, Saudi Arabia. The age range for these women was limited to child bearing age (18-48 years). All the participants completed a questionnaire structured to assess knowledge of pregnant women regarding the possible association between PD with pre-term birth and low birth weight.

Data Collection

A self-administered questionnaire used by Al Habashneh et al (2005)[27] was modified and translated from English into Arabic. Collected information included; demographic information such as participants' nationality, age, education, employment, and pregnancy status. Oral health practices were assessed by asking the participants about the frequency of daily tooth-brushing. In addition, satisfaction with oral and gum health was assessed by rating participants' satisfaction in 4-scale rating (completely satisfied - somewhat satisfied - completely unsatisfied - somewhat unsatisfied). Furthermore, the participants were asked if they had visited the dentist during current pregnancy and/or in the six-months preceding the pregnancy. The participants were enquired if they have experienced a dental problem including toothache, a loose tooth, gums problems (bleed a lot or were painful, red, or swollen), cavities that needed to be filled, or a tooth that needed to be extracted during current pregnancy.

The participants' knowledge about how oral health could affect or get affected by pregnancy was assessed by asking following questions; with response choice of Yes/No/Do Not Know.

— Do you believe that a mother would lose a tooth for each pregnancy?

— Will developing fetus obtain calcium ions from the teeth of his/her mother if she is not well-nourished?

— Do you know whether gum inflammation can induce pre-term birth?

— Do you have knowledge about whether gum inflammation can results in baby's low-birth weight?

The questionnaire was initially tested for clarity and accuracy on a sample of 100 non- participants and necessary changes were made. The questionnaire was then distributed to the participants by nurses in the department of obstetrics and gynecology at KKUH and PSMMC. The questionnaire was presented to prospective participant in an envelope that also contained study information and an invitation for a voluntary participation in the survey. After completing the survey, participants were asked to place the questionnaire back in the envelope and handover to the attending nurse. Data collection was carried out between January to March 2013.

Data entry and analysis

Data entry and statistical analysis were performed using Statistical Package for Social Sciences [(SPSS) version 16 SPSS Inc., Chicago, IL, USA)]. Assessment of statistical significance difference between different categorical groups in this study was performed using Pearson Chi-Square test at significance level α=0.05. Logistic regression model was used to calculate the odds ratio (OR) and 95% confidence interval (95% CI) for possible differences in dental service utilization based on participants' knowledge on the association between PD and some APO.

RESULTS

A total of 536 questionnaires were distributed in obstetrics and gynecology clinics in the two government hospitals in Riyadh, Saudi Arabia. A total of ninety questionnaires were excluded; 57 because of pregnancy status not filled and 33 due to the age either not reported or was not within the chosen age range. Therefore, 446 questionnaires (KKUH=229, PSMMC=217) were used for analyses with 83.2% eligibility response rate. The mean age of the participants was 29.2 years (±6.0 years). Table 1 presents the demographic characteristics of the participants. The study's participants were mainly Saudis (92.1%), had bachelor or higher degree (55.9%) and were not employed (73.1%).

Approximately three out of four participants (73.6%) reported brushing their teeth at least once a day. Slightly more than half of the pregnant women (54.7%) indicated that they were satisfied with their gum and oral health. Those with college or higher education had significantly greater oral health satisfaction as compared to those with secondary or lower education (61.4% vs. 46.4%, p =0.002). There was no significant difference between employed and unemployed participants with regards to oral health satisfaction (58.1% vs. 53.3%, p =0.37).

Only 30.1% of participants indicated that they have visited a dentist in the 6 months before their pregnancy and 20.9% of participants reported visiting a dentist during current pregnancy. With regards to dental needs during pregnancy; 71.5% of the participants believed they needed dental services during their current pregnancy. More than half (52%) of the dental needs were related to gingival and/or periodontal infection. Overall; 40% of the pregnant women reported bleeding gums, 24% painful gums, and 23% swollen gums. There was no significant difference in periodontal treatment needs in terms of various demographic factors except that employed pregnant women reported having significantly higher periodontal problems compared to un-employed pregnant women (46.2% vs. 34%, p=0.018).

Table 2 presents pregnant women's knowledge about the effect of pregnancy on oral health and possible consequences of PD on pregnancy outcome. Slightly over half (53.7%) of the participants correctly identified the unsupported statement that "a mother will lose a tooth for each child she delivers". Only about 7% of the participants knew that developing fetus does not obtain calcium ions from his mother's teeth if she is not well-nourished. Most of the participants did not know that there might be an association between PD and pre-term birth (91.1%) and baby's low-birth weight (88.6%).

Table 3 presents multivariate logistic regression model for dental visit during pregnancy. The participants who knew that PD may be associated with APO were significantly more likely to seek dental treatment during pregnancy compared to participants who did not know. (Odds ratio=2.53, 95% CI [1.42, 4.50]) (Table 3). Similar trend was not found for the reported dental visit 6-months prior to pregnancy (odds ratio=1.33; 95% CI: 0.76, 2.31).

DISCUSSION

This study sought to assess the knowledge of pregnant women regarding the possible association of PD with pre-term birth and baby's low birth weight and; to determine the contribution of such knowledge on the utilization of dental services during pregnancy. In spite of limitations such as convenience sample, lack of comparison group and possible self-response bias; the study has provided useful information that can

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

Characteristic*		n (%)
Age group (years)	18-24	112(25.1%)
	25-32	204(46.0%)
	33-39	102(22.9%)
	40-48	207(6.0%)
Nationality	Saudi	408(92.1%)
	Non-Saudi	35(7.9%)
Eduation	Primary school or lower	12(2.7%)
	Intermediate school	36(8.1%)
	Hight school	148(33.3%)
	College	223(50.2%)
	Master Degree or higher	25(5.7%)
Employment	Employed	119(26.9%)
	House wife	272(61.4%)
	Student	52(11.7%)

* Different denominators based on response to questions.

TABLE 2: PREGNANT WOMEN KNOWLEDGE ON PREGNANCY-ORAL HEALTH RELATED ISSUES

	Pregnanet Women's Response		
Information*	**Yes n (%)**	**No n (%)**	**Do not know n (%)**
Pregnant women will lose a tooth for each child birth	75(18.0%)	224(53.7%)	118(28.3%)
Developing fetus will obtain calcium from his mother teeth	335(79.8%)	28(6.7%)	57(13.6%)
Gum inflammation may lead to pre-term birth	36(8.9%)	162(40.0%)	207(51.1%)
Gum inflammation may lead to baby low-birth weight	47(11.4%)	90(21.8%)	275(66.7%)

* Different denominators based on response to questions.

TABLE 3: MULTIVARIATE LOGISTIC REGRESSION MODEL FOR DENTAL VISIT DURING PREGNANCY

	Dental visit (%)			
Variable	**Yes**	**No**	**Odds Ratio [95% CI]**	**P-value**
Education				
College or higher	16.1	83.9	0.47 [0.23 - 0.94]	0.033
High School or lower	24.0	76.0	1.00	
Satisfaction with Oral Health				
Not Satisfied	26.3	73.7	2.78 [1.39 - 5.55]	0.004
Satisfied	13.0	87.0	1.00	
Knowledge about association between periodontal disease and adverse pregnancy outcomes				
Having the knowledge	33.8	66.2	3.92 [1.68 - 9.13]	0.002
Not having the knowledge	16.8	83.2	1.00	
History of dental visit before pregnancy				
Yes	57.1	42.9	42.94 [19.55 - 94.28]	0.000
No	4.4	95.6	1.00	

be utilized by the health care fraternity to improve dental health and avoid possible adverse pregnancy outcomes in expecting mothers. The findings of this study suggest that the pregnant women have generally limited knowledge about the association between PD and some PAO. Greater utilization of dental services during pregnancy was observed among those who have knowledge about such association.

Although differences in knowledge levels exist, the findings of this study are corroborated by other studies. The present study showed that less than 12% of the participants knew about the association of PD with pre-term birth and baby's low birth-weight; the percentage was significantly lower than that reported in other studies.[27,28] Al-Habashneh et al (2005)[27] reported that 39% of the mothers who had given birth in Johnson County, Iowa, USA were aware of the possible connection between gum problems and pregnancy outcomes. Fadavi et al (2009)[28] found that 47% of the minority pregnant adolescents were aware of the association between gum problems and pregnancy outcomes. The lack of knowledge was also observed about the association of pregnancy with loss of mother's teeth and minerals from mothers' teeth for the developing fetus. The results about association between pregnancy and losing one tooth were similar to other studies.[29,30] Ozen et al (2012)[29] reported that 57% of pregnant women in Turkey were aware about the lack of association between pregnancy and loss of mother's teeth. In a geographically similar population, Hashim[30] found that 55% of sampled pregnant women in United Arab Emirates were aware that there was no association between pregnancy and loss of mother's teeth. The results of the present study about the notion that fetus obtains calcium from mothers were also similar to that of a study by Ozen et al (2012)[29] who found that 73% of the pregnant women believed in the notion.

In agreement with the findings of the present study, several other studies have also indicated that there is usually a greater utilization of dental service among pregnant women who have knowledge about possible association between PD and adverse pregnancy outcome.[27,31] This observation highlights the importance of the role of health care providers including dentists in educating expecting mothers about the value of optimal oral health for good general health of the expecting mother and their babies. Encouraging expecting mothers to seek dental assessment during pregnancy is even more important in the present study population because 37% of the sample had at least one sign of gingival inflammation. Several reports have indicated that increased gingival inflammation is a common problem during pregnancy.[3,4,32] High unmet dental needs and low utilization of dental services by expecting Saudi mothers have already been reported.[24]

The findings of the present study suggest that pregnant women lack knowledge about pregnancy and dental disease, which may prevent them from seeking dental care before and during pregnancy. It is generally recommended that a pregnant woman should be seen by a dentist at least once during pregnancy.[5] Physicians can play a major role in bridging this gap by educating the expecting mothers about the importance of oral health during pregnancy. In fact, the current recommendations and guidelines suggest that health care professionals should refer expecting mothers for oral health assessment by a dentist.[33]

CONCLUSIONS

The level of knowledge was low regarding the possible association of periodontal disease with pre-term birth and baby's low birth weight among the study sample. The expecting mothers who had knowledge about this association were more likely to seek dental treatment during pregnancy.

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