Awareness of the Association between Periodontal Diseases and Adverse Pregnancy Outcome among the General Female Population in Lagos

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ABSTRACT

Objective: Preterm low birth weight (PTLBW) is a public health issue which needs to be dealt with by educating the general female population. One of the major contributing factors is periodontal disease and treatment of the same could reduce the occurrence of PTLBW babies. Therefore, awareness of this among the female population is highly essential. Hence, this survey aims to explore the awareness of the general female population regarding the association of periodontal disease and PTLBW.

Methods: This survey was conducted on the general female population in Ikeja and Ikorodu areas of Lagos. Four hundred and twenty–four female participants completed a self-administered, structured, questionnaire each.

Results: The participants in age group 18-24years had higher knowledge scores compared with those in the age group 45-54years. The more educated participants had a higher knowledge score compared with those in the primary and non-educated groups. The awareness of the female population of the relationship between pregnancy, periodontal diseases and pregnancy outcome was low.

Conclusion: Majority of the pregnant women had a good knowledge and information about general health. But they had limited knowledge regarding periodontal disease and its adverse pregnancy outcomes.

Keywords: Female population, Awareness, periodontal disease, preterm low birth weight

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INTRODUCTION

Female population hormonal fluctuations may induce gingival tissue changes across the female life cycle. In women, estrogen and progesterone contribute to physiological changes at specific life phases. Puberty, menstrual cycle, pregnancy, and menopause are all phases that specifically influence oral and periodontal health in women. Research clearly demonstrates that puberty, menstrual cycle, pregnancy, oral contraception use, and menopause affect gingival tissue.[1-3]

Periodontal disease is defined as an inflammatory condition of the soft tissues surrounding the teeth (i.e., gingivitis) and the destruction of the supporting structures of the teeth. [4-6]

Several clinical and experimental studies have concluded that subclinical infections in pregnant women are likely the most frequent cause of low births.[7,8] Periodontal disease not only influences women oral health status, it also affects pregnancy outcomes, preterm birth and low birth weight.[9,10]

There is increasing evidence suggesting that periodontal disease is associated with systemic

diseases such as cardiovascular diseases, rheumatoid arthritis, diabetes mellitus, obesity, and osteoporosis as well as Respiratory diseases.[11-17]

Birth weight is considered to be an important factor in determining the chance of survival, growth and development of an infant. It has also been used as an indicator for the health of the entire population under study. Preterm birth is defined as labour or birth before 37 weeks of gestation, while low birth weight is defined as birth weight <2.5 kg.[10] Pre Term Low Birth Weight (PTLBW) is a significant health issue in both developed and developing countries, as the prevalence of preterm low birth weight (PTLBW) has actually increased.[18]

Studies have shown that during pregnancy, maternal genitourinary infections, low maternal height, lower socioeconomic status, nutrition, stress, and absence of prenatal care are the main risk factors. About 25% PTLBW occurs without a suspected factor.[19,20] Periodontal disease accounts for about 18.2% of all PTLBW cases.[10] PTLBW is a significant public health problem, any contribution to reduce its occurrence would make a great difference to the economy. Hence, it was necessary that the female population should be aware and have the knowledge of the problem. There is a need to educate the female population on the adverse pregnancy outcomes due to periodontal diseases and to plan education schemes. It is necessary to evaluate the awareness of the association between pregnancy and periodontal disease among the general female population.

This survey was conducted on a general female population to assess their awareness regarding the association between periodontal disease and PTLBW.

MATERIAL AND METHODS

Study Design, Study Period, and Study Population

This was a Community based cross-sectional descriptive study carried out on the general female population in Ikeja and Ikorodu areas of Lagos, Lagos State from December 2017 to February 2018. The participants were selected from all females who had resided in study areas for at least 6 months and who were available during data collection period. Eligible women were given information regarding the study, and their informed consent was obtained prior to participation in the study

Inclusion criteria: Female of at least 18 year of age, willing and able to give an informed consent.

Exclusion criteria: Patients unable to interpret or answer the questions, such as patients with neurological or cognitive disorders.

Sample size

The sample size was determined by the assumption that 50% of female population are not aware of the association between periodontal disease and adverse pregnancy outcome with 5% marginal error and 95% confidence Interval and a non response rate of 10%. Based on this assumption, the actual sample size was determined by using the formula for estimating the appropriate sample size for descriptive studies as stated below:[21] $n = z^2Pq/d2$ Where n = Sample size, z=z value corresponding to a 95% level of significance = 1.96, p=expected proportion of awareness of females =50% =0.5, q=(1 - p) = (1-0.5) = 0.5, d=absolute precision (5%), None response rate =10%. Therefore, from the above, the minimum sample size is: $n=1.96^2 \times 0.5 \times 0.5/0.05 \times 0.05$. n=384+38=422.

Sampling Techniques

This cross-sectional study was conducted in both urban and rural communities. Multi-stage sampling technique was used in selecting the study participants. A list of all the four (4) rural LGAs and another list of the 16 urban LGAs in Lagos State constituted the sampling frame in stage one. Stage one involved the selection of two LGAs, one urban and one rural area by simple random sampling (balloting). At the second stage, one Local Council Development Area (LCDA) each was selected from the LGAs by simple random sampling. At the third stage, one community (political ward) each from the (LCDA) was selected by balloting. In each political ward, the appropriate number of respondents selected was determined in proportion to the number of streets contained in the ward. A total of four hundred and twenty-four women were recruited from the two local government areas (LGAs). Only one eligible respondent was interviewed per household. In a household which had more than one eligible respondent, only one of them was randomly selected.

Questionnaire

Participants were requested to complete a self-administered, structured, questionnaire. The first section of the questionnaire recorded demographic information (age, marital status, educational status and occupation). The second section recorded oral hygiene practices, while the third section comprised of questions pertaining to awareness of the relationship between oral health and pregnancy,

knowledge of the association between periodontal disease and PTLBW, history of periodontal disease i.e changes seen in the gingiva during pregnancy, effect of oral hygiene and dental treatment in pregnancy. The responses of each question were scored as "1" for correct response and "0" for incorrect response. All the correct answers were summed up to give the Total Awareness Score and the mean of the total scores of awareness was used to determine the mean value of 'good awareness', where a score less than the mean value was categorized as 'poor' and a score equal to or more than the mean value was categorized as 'good'.

Ethical Considerations

Approval for this study was obtained from the Ethic Committee of Lagos State University Teaching Hospital Ikeja, Lagos.

Statistical analysis: Data was analyzed using IBM SPSS version 20. Results of continuous measurements was presented as mean ± standard deviation and that of categorical measurements presented in a number (%). Student t-test was used for continuous variables and Chi-square test was utilized to detect significant associations between categorical variables. Pearson's correlation analysis was conducted to evaluate the association between age, educational status, marital status and knowledge score. Statistical significance was set at P <0.05.

RESULTS

Four hundred and twenty-four females in the age range of 18-65years, participated in this study. There were more 137(32.3%) participants in age group 35-44years and least 35(8.3%) in age group, 18-24 and 55 -65years. Mean age was 37.6 ± 10.8 years. There were more married participants than the unmarried. Majority (75%) of the participants were with tertiary and above educational status. (Table 1)

Table 1: Demographic distribution of the participants

Variable	Frequency (n)	%
Age group (years)		
18 -24	35	8.3
25 -34	131	30.9
35-44	137	32.3
45-54	86	20.3
55-65	35	8.3
Marital status		
Single	68	16.0
Married	356	84.0
Educational level		
None	29	6.8
Primary	18	4.2
Secondary	58	13.7
Tertiary	188	44.3
Post graduate	131	30.9
Total	424	**100.0**

The awareness of the participants that good oral hygiene (OH) is important for good health was 94.3%. The awareness of the participants of the relationship between Pregnancy and periodontal disease was 24.3% and the awareness of the relationship between pregnancy and pregnancy outcome was 7.3 %. Table 2 showed the responses of the participants to the knowledge questions Mean awareness score of the participants was 3.89± 1.64, out of a maximum score of eight (8). Most of the respondents (70.5%) had poor awareness and only 29.5% had good awareness. Mean awareness score was highest in age group 35-44years and lowest for 45-54 age group. The mean awareness score was higher among the unmarried group than the married group. The awareness score was highest in the tertiary educational group and lowest in the primary educational group (Table 3).

Table 2: Responses to individual questions on Awareness of periodontal disease and pregnancy outcome among the population

Questions	Correct response		Incorrect response	
	n	%	n	%
Good oral hygiene for good systemic health	400	94.3	24	5.7
Asso. between oral health & systemic health	262	61.8	162	38.2
Periodontal disease is related to pregnancy	103	24.3	321	75.7
Pregnancy makes gum bleed, swell	97	23.0	327	77.0
Extra dental care in Pregnancy	276	65.0	148	35.0
Can dental treatment be done in pregnancy	194	45.8	230	54.2
Knowledge of PML and LBW	296	69.8	128	30.2
Periodontal diseases related to PTLBW	31	7.3	393	92.7

Table 3: Variables with Awareness and Mean Awareness Score

	Awareness Score					
	Good		Poor			
Variable	n	%	n	%	Frequency	Mean ± SD
Age group (years)						
18 -24	11	31.4	24	68.6	35	4.03 ± 1.839
25 -34	37	28.2	94	71.8	131	3.93 ±1.510
35-44	48	35.0	89	65.0	137	4.09 ± 1.768
45-54	19	22.1	67	77.9	86	3.53 ± 1.554
55-65	10	28.6	25	71.4	35	3.71 ± 1.506
	P=0.347					P=0.139
Marital Status						
Single	19	27.9	49	72.1	68	3.94 ± 1.76
Married	106	29.8	250	70.2	356	3.88 ± 1.62
	P=0.761					P=0.782
Educational level						
None	8	27.6	21	72.4	29	3.66 ± 1.610
Primary	0	0.0	18	100.0	18	3.06 ± 0.639
Secondary	17	29.3	41	70.7	58	3.81 ± 1.616
Tertiary	60	31.9	128	68.1	188	4.06 ± 1.720
Post graduate	40	30.5	91	69.5	131	3.85 ± 1.605
	P= 0.085					P=0.114
Total	125	29.5	299	70.5%	424	3.89± 1.640

DISCUSSION

The results of this survey showed that 94.3% of the general female population was aware that oral hygiene measures are necessary for good systemic health and 61.8% of them were aware that oral health is related to systemic health. This result is similar to the report of Gupta et al. [22] Also, 65.0% of the population under survey agreed that additional oral hygiene is required during pregnancy. This was similar to the report of Tarannum et al,[23] in their study on the awareness of the association between periodontal disease and adverse pregnancy outcome among the general female population in India. About 46% of the population in this survey agreed that dental treatment can be carried out during pregnancy. This was similar to the report of the study from India. [23]However, the awareness to the association between periodontal diseases and PTLBW was very low (7.3%), lower than the 37.5% reported by Gupta et al.[22] and 38.4% of Tarannum et al.[23] This indicates that this female population was not aware of the relationship between oral health

and adverse pregnancy outcome.The awareness of the association of pregnancy and signs of periodontal disease was low. The results of this survey suggest that the general female population was either not aware of the signs of perodontal disease or aware of the association with pregnancy. This was similar to the report from a study in India.[23] This indicates a need for proper oral health education of the female population.

During pregnancy, periodontal tissues' response to biofilm challenge is reinforced as female sex hormones are necessary but not sufficient to produce gingival changes by themselves and usually plaque plays a role.[24] Pregnancy is accompanied by an increase in the levels of both progesterone and estrogen.[25] Pregnancy affects the severity of previously inflamed gingival tissues but does not alter healthy gingiva.[26] Pregnant women with previous chronic gingivitis, which attracted no attention before pregnancy, become aware of their gingival status as the previously inflamed areas become enlarged and edematous and more noticeably discolored with an increased tendency to bleeding.[27] Ideally, women should be healthy without gingival and periodontal diseases before becoming pregnant, and they should be educated and motivated to maintain a high level of oral hygiene prior to and throughout pregnancy. Improving maternal oral hygiene is important for oral health and may reduce systemic proinflammatory cytokines and improve maternal outcomes.[28] The American Academy of Periodontology, in 2004, released recommendations that all pregnant women, including those planning a pregnancy, should undergo periodontal examination and, if indicated, should be provided with the appropriate preventive and/or therapeutic services.[29] As part of routine, all women should be encouraged to schedule a dental examination if it has been more than 6 months since their last examination or if they have any oral health problems.[30]The mean awareness score of the participants was 3.89± 1.64 and there was also inadequate awareness among majority (70.5%) of the study population. The awareness was low irrespective of the participants age, marital status or educational qualifications. This report was in contrast to the study done in India.[23] The general poor awareness of and poor attitude to oral health among Nigerian population as recorded in previous studies may be responsible for the low awareness recorded in this study.[31-34] This low awareness could also be attributed to the limited awareness of the general medical practitioners and gynecologists about the association between periodontal diseases and systemic disease as documented in some of the previously conducted surveys.[35, 36] A previous survey showed that only about 39% of medical practitioners were aware of the association between periodontal disease and PTLBW.[37] In women, estrogen and progesterone contribute to physiological changes at specific life phases. Puberty, menstrual cycle, pregnancy, and menopause are all phases that specifically influence oral and periodontal health in women.[38]There is growing evidences of strong association between periodontal disease and systemic health such as cardiovascular diseases, diabetes, Alzheimer disease, respiratory infections, as well as osteoporosis of the oral cavity. These are all significant diseases that affect women across their lifespan.[11–17] The prevention and treatment of these disorders are essential for general well-being. It is important to improve the knowledge of medical practioners and gynecologists through elaborate educative programs. This can be possible through a joint effort from the health care sector which includes general medical practitioners, gynecologists, and general dental practitioners.We therefore suggest that a multidisciplinary medical team including dentists should assume a more active role in providing oral health education to female population. The limitation of the present study, was mainly the reliance on self-reported data which can be subjected to biases inherent to this method.There are few literatures published to address the awareness of the general female population on the association between periodontal disease and pregnancy, hence the results of this survey cannot be discussed with many comparison.

CONCLUSION

Majority of the females had good knowledge and information about general health, but they had limited knowledge and awareness regarding periodontal disease, and its effect on the pregnancy and adverse pregnancy outcomes. Most of these

women need more information about oral health, periodontal diseases and its association with PTLBW.

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