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Original Article

Awareness of the association between periodontal disease and adverse pregnancy outcome among the female population in Benghazi city-Libya

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ABSTRACT

Objectives: Chronic periodontitis is initiated and sustained by bacterial plaque, but host defence mechanism plays an integral role in it is pathogenesis. Periodontal disease (PD) is affecting more than 23% of women between the age of 30 and 54 years. Female sex hormones – progesterone and estrogen- vary in their levels throughout a women's life, depending on which phase she is at (Puberty, Pregnancy or menopause). Progesterone has a stronger influence as an inflammatory mediator. The mechanism Periodontitis is probably one of the pathologic insults to normal gestational function and causes adverse outcomes (APOs).

Design: A Cross-sectional survey was conducted among female sample in Benghazi city. A structured interview questionnaire was used in this study.

Results: Two hundred and nine female their age ranged between 20 to 60 years were participated in the study. 38.9% of the participating females have known that there is an association between periodontal disease PD and general health. But only 31.4% knew that PD increases during pregnancy (younger age group). Despite that 43.3% of the sample was aware about the symptoms of PD, 50.2% did not visit a dentist for more than one year and only 14.8% visited a dentist when there is pain or discomfort. Whereas, 88% of the sample had no idea that there could be an association between PD and adverse pregnancy outcome.

Conclusion: There was a deficiency in the knowledge of female population about periodontal disease in relation to hormonal changes and the adverse effects on pregnancy.

Keywords: Female awareness, periodontal disease, adverse pregnancy outcomes.

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INTRODUCTION

Periodontal disease is one of the most common chronic disorders of infectious origin known in human with a prevalence of 10-60% in adults⁽¹⁾. It is affecting more than 23% of women between the ages

of 30 and 54 years⁽²⁾. Depending on the extent of inflammation, the destructive process may involve the soft tissue surrounding the teeth without loss of attachment (gingivitis), and /or the deep supporting tissue of the teeth; the periodontal ligament, cementum, and the alveolar bone with loss of attachment (Periodontitis)⁽³⁾.

Studies reveal that during pregnancy there is an increase in progesterone and estrogen levels which affect gingival tissues and sub-gingival micro- flora⁽⁴⁾. They also lead to increase tendency of gingival inflammation, where the gingival tissues become more edematous, erythematous and easily to bleed⁽⁵⁾.

In the absence of adequate oral hygiene, periodontal microorganisms accumulate and form an organized structure known as a "bacterial biofilm". In mature biofilms, the bacteria possess a virulence factors that may cause direct destruction to the periodontal tissues or stimulate the host to activate a local inflammatory response that, although intended to eliminate the infection, it may lead to further loss of periodontal structures. Moreover, bacteria and/or

their shed virulence factors may get introduced into the bloodstream disseminate throughout the body and trigger the induction of systemic inflammatory responses and/or ectopic infections ^(4, 6).

Preterm birth (PTB) refers to the delivery of a new born child before the 37th week of pregnancy and low birth weight refers to the birth of newborn child with a weight equal or less than 2500 gm grouped under the term of preterm low birth weight (PLBW) ^(7, 8). PLBW is one of the highly significant causes for mortality and morbidity among infants ⁽⁸⁾. However, preterm and LBW infants who survive the neonatal period face a higher risk of developing: neuro-developmental problem (cerebral palsy, blindness, and deafness), respiratory problems (asthma, lower respiratory infections, broncho-pulmonary dysplasia, chronic lung disease), behavioral problems (attention deficit hyperactivity disorder), learning problems, cardiovascular disease and metabolic abnormalities (obesity, type 2 diabetes mellitus) ⁽⁹⁻¹³⁾.

Pregnant women have particularly high risk for gingivitis but low use of dental care ⁽¹⁴⁾. Studies concluded showed that there was a deficiency in the knowledge of female population about periodontal disease in relation to the adverse effects on pregnancy ^(15, 16).

This study will be conducted on a sample of the female population in Benghazi city to assess their awareness regarding periodontal disease and adverse effect on pregnancy.

MATERIALS AND METHODS

Cross-sectional survey study was conducted among general female population in Benghazi city to assess their awareness regarding periodontal disease and adverse effect on pregnancy. Structured interview questionnaire in Arabic native language was used in this survey. It was distributed among private and public hospitals and other facilities such as schools. A total of 209 questionnaire were collected. The study participants included were present in many facilities such as gynecology clinic at private and public hospitals, students at colleges and schools.

The questionnaire includes eleven questions addressing as socio- demographic personal data. Questions that aimed to assess the knowledge and awareness of the participants towards oral health and the association between periodontal disease and adverse pregnancy outcome. All participants will be informed orally about the nature and purpose of the

study. A total of 209 questionnaire were collected. The study participants included were present in many facilities such as gynecology clinic at private and public hospitals, students at colleges and schools.

Inter-view questionnaire

- Q1. Is good oral hygiene necessary for good health?
- Q2. Is there any association between periodontal disease and general health?
- Q3. Do you go to your general dentist when there is a problem with the teeth and gums or as regular checkup?
- Q4. Do you think there is association between pregnancy, hormonal changes and periodontal disease?
- Q5. What are the symptoms that could appear on the gingiva during pregnancy:?
 1. Bleeding.
 2. Redness.
 3. Localized or generalized swelling.
- Q6. For woman who are pregnant or have experienced past pregnancy:
 - a. Did you experience any of the following changes during pregnancy:?
 1. Bleeding gum.
 2. Swelling gums.
 3. Itching and pain.
 4. Loosening teeth.
- Q7. Have you experienced a premature birth or low birth weight? If yes, have you been informed by your gynecologist what is main cause of the problem?
- Q8. Do you have knowledge of that chronic periodontitis is a risk factor for adverse pregnancy outcome:
 1. Preterm birth.
 2. Low birth weight.
- Q9. Do you think that oral hygiene care is necessary during pregnancy?
- Q10. Do you think that the pregnant lady can receive treatment of periodontal disease during pregnancy if yes, when:
 1. First trimester 1-3 months.
 2. Second trimester 4-6 months
 3. Third trimester 6-9 months.

Q11. When was your last visit to the dentist or periodontist: 3 months, 6 months, 1 year, more than 1 Year ?

Name

Age

Occupation

Education: primary secondary University

Statistical analysis

All the results were collected, tabulated and statistically analyzed using SPSS statistical package (Microsoft windows version 18).

RESULTS

Two hundred and nine female patients were participating in this study with different age groups. The mean age = 30 year, the age range was from 20 to 70 Years as shown in figure 1.

(Mean age = 30.9 years. Std. Deviation = 11.3 years. Mean = 30 years. Minimum age = 12 years. Maximum = 70 Years).

In this study, the education level was assessed in our female sample. The highest category of the sample was from secondary school level 47%, and a percentage of 45% was graduated from the university, while 7.2 % their education level just at primary school level (Figure 2).

99.5% of the female sample considered that the oral hygiene is important to the general health. While 94.7% of the participants considered that oral hygiene of the mouth during pregnancy is important, whereas

5.3% thought it's not important, illustrations shown in figure 3 and 4.

Figure 5 shows that 91% of the female sample thought that the healthy gum is important to the general health, while 8.6 % answered that there is no relation between the two variables.

The dental routine visit showed only 14.8% go for a regular checkup. Whereas, 85.2% of the sample go to the dentist when there is a symptom such as bleeding gum or pain (Figure 6).

67% of the participants agree on that gingivitis during pregnancy, however, only 33% did not agree (Figure 7).

Table 1 shows a 67.9 % of females know at least one of the common symptom of gingivitis (bleeding, redness, swelling), and a 32.1 % they do not have any knowledge about symptoms associated with gingivitis.

As for the ladies who experienced gingivitis during pregnancy presented about 43.3%. Whereas, 56% of the participants did not experience any symptoms. (Table 2).

Table 3 shows that 99.04% of the participants had normal gestation age delivery. And only two of them had premature delivery labor. They have been informed by their gynecologist that the reason was because the mothers were diabetic. In the meantime 88% of participants they did not have any idea about gum diseases could be a risk factor for premature delivery and a percentage of 12 % thought it could be

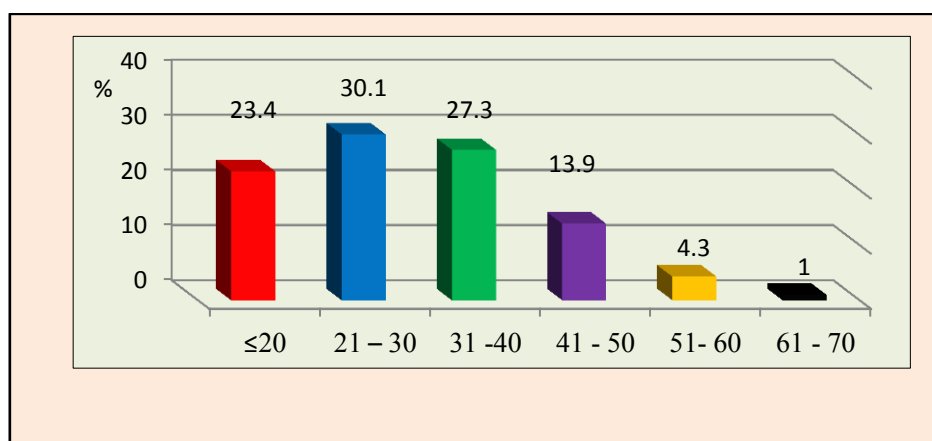


Figure. 1: Distribution of participate according to the age.

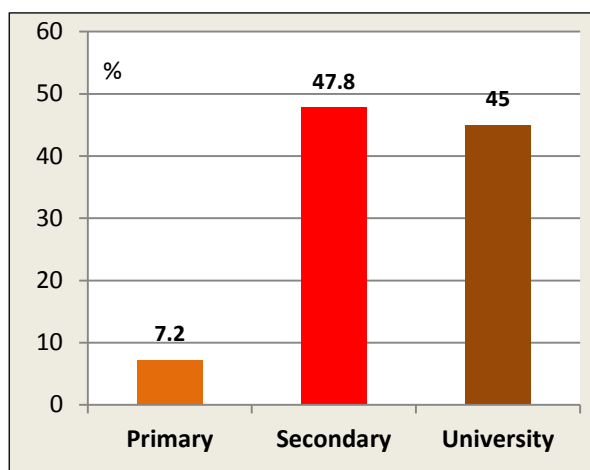


Figure 2 : Distribution of patients according to the level of education.

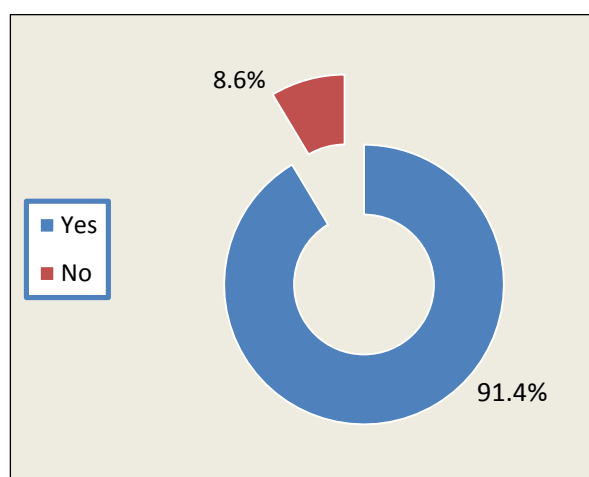


Figure 5: Distribution of female sample according to if, there is relation between gum disease and general health.

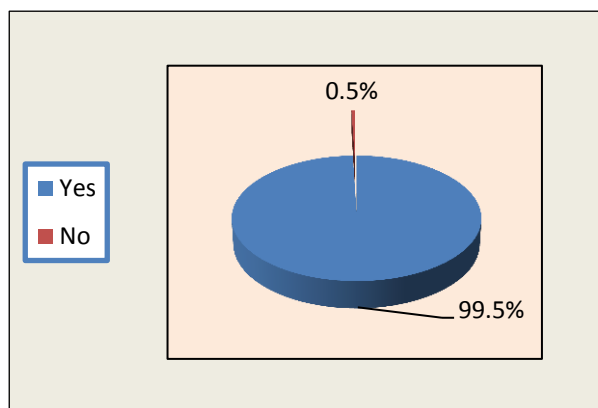


Figure 3: Distribution of participative according to their answering for the importance of oral hygiene to the general health.

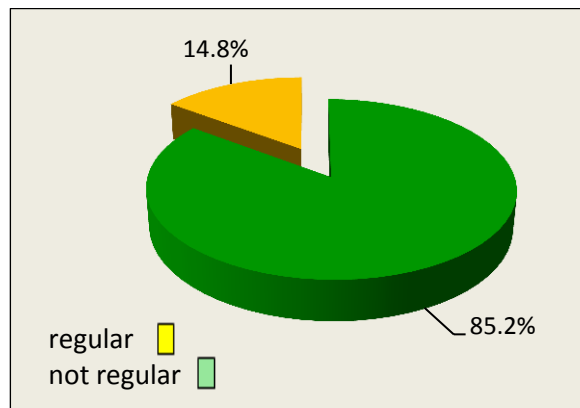


Figure 6: Distribution of female sample according to if she visits dentist routinely or when there is symptoms.

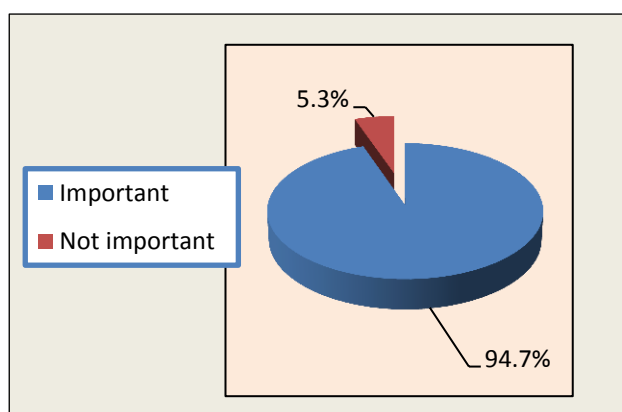


Figure 4: Distribution of patients according to if hygiene of the mouth during pregnancy is important.

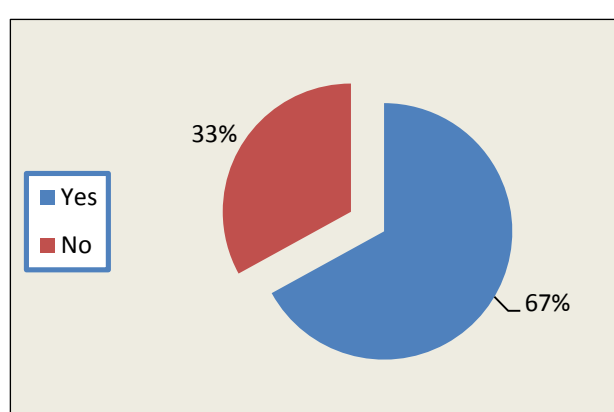


Figure 7: Distribution of female sample answering, if the gingivitis increases during pregnancy.

Table 1: Knowledge of female studying sample to the symptoms of gingivitis.

Symptoms of gingivitis	No.	%
Mention at least one symptom	142	67.9
Do not know any symptoms	67	32.1
Total	209	100

Table 2: Distribution of participants according to their experience to gingival disease .

Symptom of gum disease	No.	%
Yes	81	43.3
No	106	56.7
Total	187	100

Table 3: Distribution of participants, if she had a history of premature labor.

Premature labor	No.	%
no	207	99.%
yes	2	1.0 %
Total	209	100

This study revealed that 29.2 % of the female sample think that treatment of gum disease should be at 2nd trimester. And 22.5% said it's at the 3rd trimester. 16.3% thought that treat is safe at 1st trimester. While the higher percentage (32%) thought it is not safe to do any treatment during pregnancy (Figure 8).

This study showed 50.2% of the sample did not attend the clinic for more than one year. And a percentage of %9,1. 12.9%, 27.8% they had their dental checkup at 3, 6, and one year respectively (Figure 9).

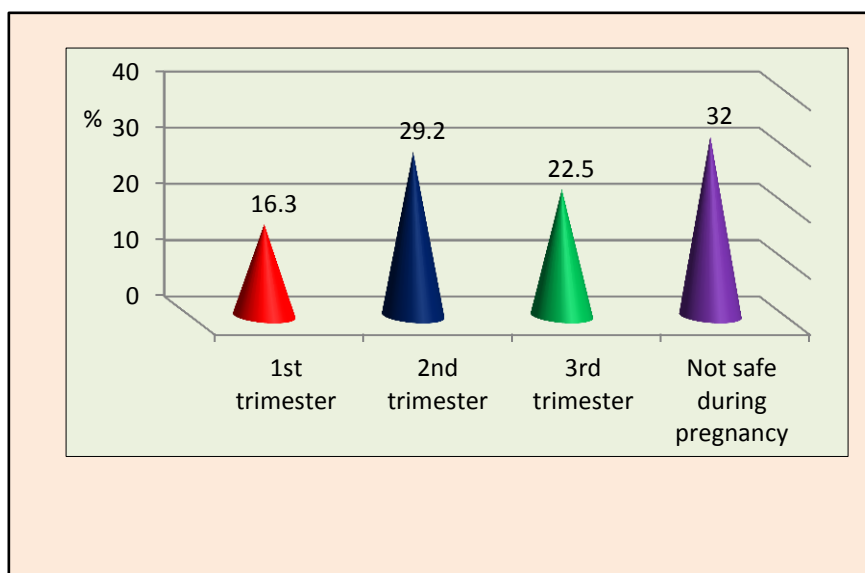


Figure 8: Distribution of patients according to the safest time during pregnancy to treat gum problems.

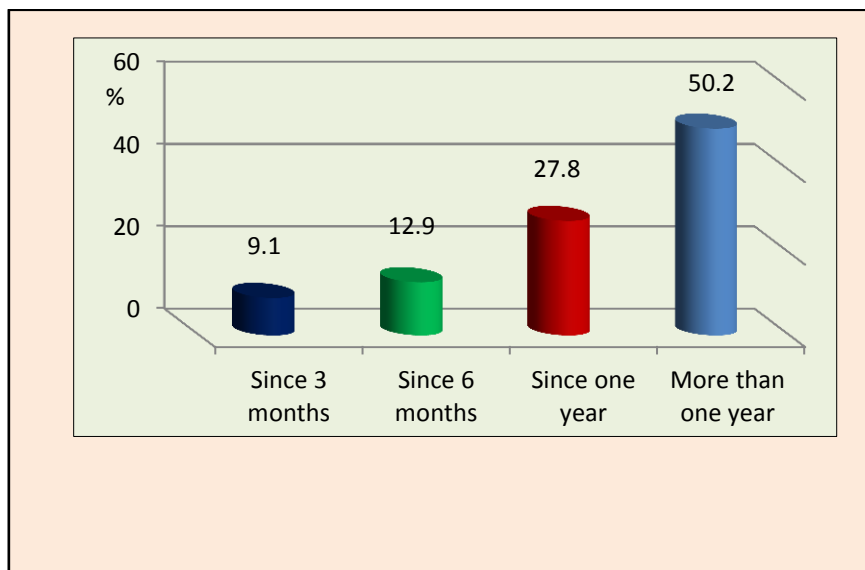


Figure 9: Distribution of patients according to when was the last visit to dentist.

In this study statistical analysis and comparison by using Chi-square test did not shows any significant differences between multiple variables:

Age and knowledge relation to gum disease and general health showed a $p = 0.216$ (Not significant). Age and female visit to the dentist routinely or when there are symptoms. $p = 0.381$ (Not significant). Age

to the presence of the gingivitis increase during pregnancy $p = 0.745$ (Not significant). Age and knowledge to the symptoms of gingivitis $p = 0.971$ (Not significant).

Also, level of education and oral hygiene measures presented a $p = 0.243$ (Not significant). Level of education and visit dentist routinely or

when there is symptoms, $p=0.901$ (Not significant). Level of education and if the gingivitis increases during pregnancy $p=0.322$ (Not significant).

DISCUSSION

Periodontal disease (PD) has been recognized as a major global public health problem due to its prevalence, economic impact on the health care system and health consequences^(17, 18).

In this study we assess the awareness of the association between periodontal disease and adverse pregnancy outcome among sample of female population in Benghazi city – Libya.

European Federation of Periodontology (EFP), calling upon dental and health professionals to act on the prevention, early diagnosis, and effective management of PD⁽¹⁸⁾.

The results of this study showed that 99.5% of the general female population was aware that oral health is related to systemic health. And 94.7 % of the participant's thoughts that oral hygiene measures are important during pregnancy. A percentage of 91.4% agree that there is relation between PD and general health.

This is indicating that this sample population is aware that adverse oral health can have adverse effects during pregnancy. This probably can be attributed to the increasing awareness of the level of education which had a significant impact on the knowledge score.

Our sample study shows that 85.2 % they visit the dentist when they feel there is a bleeding gum or pain. But 14.8% they go for regular checkup and this could be attributed to the circumstances of the Libyan population economic status.

However, when questioned about the association of pregnancy to signs of periodontal disease this female sample presented 67% agreement on that there increase of gingivitis during pregnancy, while 33% they did not agree.

But in respond to our question in this study (symptoms of gingivitis during pregnancy), 43.3% of the participants said yes, while 56% said no.

Gingival inflammation associated with pregnancy has been initiated by dental plaque and exacerbated by endogenous steroid hormones. Clinically, preexisting gingivitis or periodontitis in pregnant women may increase in severity during gestation^(19, 20). Studies reveal that during pregnancy there is an increase in progesterone and estrogen levels which affect gingival tissues and sub-gingival micro- flora⁽⁴⁾.

inflammatory mediator response and pregnancy outcome in hamsters. Infect immune 1994;62(10):4356-61.

This study shows that 29.2 % of female sample found that the safest time to treat their gum problem at 2nd trimester, and 22.5% of them said the 3rd trimester. 16.3% thought it is at 1st trimester, While the higher percentage 32% thought it is not safe to do any treatment during pregnancy.

However, about the association of pregnancy to signs of periodontal disease the results of this survey suggested that a high percentage of general female population aware of the gingival changes during pregnancy. But 88% of participants they have no idea about gum diseases could be a risk factor for premature delivery, and 12 % thought it could be. This study showed Low level of the awareness presented to the association between periodontal diseases and PTLBW. Offenbacher et al. were the first group of investigators to report a link between poor maternal periodontal health and adverse pregnancy outcomes (APO) including preterm delivery. They concluded that 18.2% LBW may result from periodontal disease^(21, 22). In contrary, the studies conducted in European countries and Canada did not find an association between periodontal disease and adverse pregnancy outcomes (APO).

The AAP recommended that all women who were pregnant or planning a pregnancy should receive preventive dental care to improve the oral health⁽²³⁾. Similar recommendation issued by Academy of General Dentistry (AGD)⁽²⁴⁾. While it remains inconclusive whether maternal periodontal treatment improves pregnancy outcome, treatment of varying degrees of clinical periodontal disease during pregnancy is safe and improves maternal oral health^(23, 25).

Measures should be taken to increase the awareness about this association. Encouraging which could be achieved by female population for regular checkups and improve female oral health.

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