CHRONIC PERIODONTITIS AND ADVERSE PREGNANCY OUTCOMES: A QUESTIONNAIRE SURVEY REGARDING GYNECOLOGISTS KNOWLEDGE ATTITUDE AND PRACTICE BEHAVIOUR IN TERTIARY CARE HOPSITALS OF PESHAWAR

Hussam[1], Tariq Ali Khan[1], Safia Rehmat[1], Zeeshan Danish[1], Muhammad Naveed Khan[1], Jamil Orakzai[1]

[1]Department of Periodontology Khyber College of Dentistry Peshawar

ABSTRACT

Objective: *The purpose of this study is to assess the knowledge, attitude and practice of gynecologists on the relationship between pregnancy and chronic periodontitis.*

Materials and Methods: *A cross-sectional questionnaire-based study was conducted among 271 Gynecologists and Training medical officers (TMO) of the Gynaecology/obstetrician department of three tertiary care hospitals in Peshawar to assess the level of their knowledge and awareness about relationship between chronic periodontitis and adverse pregnancy outcomes.*

Results: *The general level of the gynaecologists' knowledge regarding relationship between periodontitis and adverse pregnancy outcomes in this study was found unsatisfactory and there is also a minor misunderstanding among gynecologists regarding the provision of different dental treatments during pregnancy.*

Conclusion: *Majority of the gynecologists were unaware about the bidirectional relationship between chronic periodontitis and adverse pregnancy outcomes. Therefore, awareness through interactive seminars and workshops on this topic might help in raising awareness among health-care professionals and updating their knowledge of Perio-systemic interaction and can reduce the incidence of maternal and neonatal complications.*

Keywords: *chronic periodontitis, adverse pregnancy outcomes, knowledge, gynecologists*

INTRODUCTION

Periodontal disease is an inflammatory disease of bacterial aetiology.[1] Plaque induced gingivitis is the most common form of periodontal disease.[2-4] It is characterised by inflammation of the gingiva and is associated with the presence of bacterial plaque at the gingival margin. Gingivitis results in minimal soft tissue damage, no observable loss of bone and no loss of tooth attachment. Indeed, the inflammation that is characteristic of gingivitis is reversible upon removal of gingival plaque.[5] However, without adequate oral health care, plaque induced gingivitis can progress to chronic periodontitis. Chronic periodontitis is characterised by a chronic and dysregulated inflammatory response which leads to the destruction of the alveolar bone, cementum, periodontal ligament and gingiva which support the tooth and therefore ultimately tooth loss. Common forms of periodontal disease have been associated with adverse pregnancy outcomes, cardiovascular disease, stroke, pulmonary disease, and diabetes. Prevention and treatment are aimed at controlling the bacterial biofilm and other risk factors, arresting progressive disease, and restoring lost tooth support.[6] In the last half-century, dentists and physicians have emphasized that periodontal infections are localized to the marginal periodontium and that, as such, they

Correspondence:
Dr. Hussam
Department of Periodontology Khyber College of Dentistry Peshawar
Email: h_siddiki@hotmail.com
Contact: +92-333-9996060

rarely have systemic implications in healthy individuals. More recent evidence, however, has indicated that patients with severe periodontitis have increased serum levels of CRP, hyper-fibrinogenemia, moderate leucocytosis, as well as increased serum levels of IL-1 and IL-6 when compared with unaffected control populations.[7]

Pregnancy involves complex physical and hormonal changes that affect almost every organ system including the oral cavity. Oral problems like gingivitis and periodontal infections are associated with pregnancy.[8] During pregnancy, gingivitis is the most common disease observed in pregnant patients due to the increase in hormones oestrogen and progesterone. It has been shown that these hormones influence the development of gum disease and healing of the wounds.[9] These two hormones results in increased gingival vascularization and decreased immune response.[10] In addition studies[11, 12] have shown that during pregnancy there is an increase in certain types of microorganisms (Prevotella species) that tend to use the steroid hormones of pregnancy for their growth. Theses microorganisms increase the bleeding tendency of the gingiva further deteriorate the inflammation. As a result, pregnant patients have severe gingivitis even with a reasonably low plaque levels.

Periodontal diseases are considered to be a risk factor for adverse pregnancy outcomes like preterm birth (PTB) and Low birth weight (LBW) babies (Reference). In contrast, hormonal changes i-e the rise of ovarian hormones (oestrogen and progesterone) during the pregnancy also increases the risk of gingival inflammation in the presence of plaque deposits.[13, 14] The incidence of gingivitis in pregnant women has been reported 30 to 100 % where plaque deposits were present.[14, 15] The effect of periodontal disease during antenatal period might be elucidated as the migration of periodontal pathogens to the feto placental unit and/or by inflammatory mediators produced during periodontal infection.[16-18]

MATERIALS AND METHODS

A cross-sectional study based on self-administered and structured questionnaire was carried out at three different hospitals in Peshawar, Pakistan: 1- Gynaecology/obstetrician department of Lady reading hospital: 2- Gynaecology/obstetrician department of Khyber teaching hospital and 3- Gynaecology/obstetrician department of Hayatabad Medical Complex. The questionnaire was pre-tested before use in the field to investigate to what extent Gynaecologists could easily understand its content. Five employees from the Gynaecology/obstetrician department of Khyber teaching hospital and five from the periodontology department of Khyber College of dentistry were asked to fill out the questionnaires and discuss their impressions of the questionnaire. As the questionnaire appeared to be easily understood, therefore, no changes were made.

The questionnaire used for survey consisted of 12 close-ended questions. The first part of the questionnaire was related to the information on demographic and job-related aspects including gender, designation, qualification and years of practice. Another part of the questionnaire contained questions which aimed to assess knowledge behaviour and practice of gynaecologists towards oral healthcare by pregnant patients specifically relationship between chronic periodontitis and adverse pregnancy outcomes. The study was approved by the ethical committee of Khyber College of dentistry Peshawar. The study was conducted from August 2018 to September 2018. The purpose of the study was explained to the participants of concerned department and a verbal and written informed consent was obtained. A structured questionnaire was distributed among the Gynaecologists and Training medical officers (TMO) of the Gynaecology/obstetrician department of the respected hospitals. All gynaecologists took part in the study voluntarily and it took 5-10 minutes to complete the questionnaire before they handed it back to the researcher of the study.

Statistical analysis:

The sample size was calculated through WHO sample size calculator. The total calculated sample size was 217 by taking 90% frequency of the gynaecologist about the perception that pregnancy increases the likelihood of gingival inflammation (19) by keeping a 4% margin of error and a 95% confidence interval. All questionnaires returned to the main researcher were coded and analysed. The results were expressed as number and percentage of respondents for each question and were analysed using SPSS statistical package.

RESULTS

Two hundred and seventeen eligible Gynaecologists including professors, associate professors, assistant professors, registrar and residents/training medical officers (TMO) of the Gynaecology/obstetrician department of three tertiary care hospitals of Peshawar were approached and agreed to participate in this study. Completely filled questionnaires yielding a response rate of 100% were returned to the researcher. Sixty two (62%) percent of the participants were at the level of residents/TMO and fifty nine (59%) percent had an experience of less than 5 years [Table 1].

Table 2 shows the gynecologists answers to the questions aimed to evaluate their knowledge about the relationship between periodontitis and pregnancy. The majority (44%) of the participants were of the opinion that there is no relationship between periodontal diseases and pregnancy. 55% of the participants did not know that pregnancy increases the possibility of gingival inflammation (pregnancy Gingivitis/Pregnancy Tumour). Additionally, 57% didn't know that gingival/periodontal inflammation can increase the risk for both preterm labour and/or low birth weight babies.

This study found that the main types of treatment that gynaecologist believed that their pregnant patient could safely obtain were scaling/root planing and Crown/bridges (79% and 78%, respectively), while dental radiographs were considered safe to be attainable to the pregnant patients by only 2% of the gynaecologists [Table 3].

Table: 1 Demographic data of the study participants

	Frequency	Percentage
Designation		
Professor	07	03
Associate Professor	10	05
Assistant Professor	44	20
Registrar	21	10
Resident / TMO	135	62
Years in Practice		
< 5	129	59
5- 10	65	30
> 10	23	11

Table: 2 Knowledge of gynecologists about gingival/periodontal infection during pregnancy

Knowledge statement	Number	Percentage
Are you aware of any Relationship between Periodontal diseases and pregnancy?		
Yes	76	35
No	96	44
Don't know	45	21
Does Pregnancy increase the likelihood of gingival inflammation (pregnancy Gingivitis/Pregnancy Tumor)?		
Yes	75	35
No	22	10
Don't know	120	55
Does a Periodontal disease increase the risk for both preterm labor and/or low birth weight?		
Yes	22	10
No	71	33
Don't know	124	57

Table: 3 Dental treatments/procedures considered safe by gynecologists during pregnancy

Dental treatments/ procedures	Safe (%)	Unsafe (%)	Don't know (%)
Scaling / Root planing	79	05	16
Crown and Bridges	78	03	19
Root canal treatments/ Fillings	60	09	31
Extractions	72	06	22
Radiographs	02	87	11

Table: 4 Opinions of gynecologists regarding dental treatment during pregnancy

	Number	Percentage
Do you advise your patients to visit dentist during pregnancy?		
Yes	33	15
No	184	85
Do you advise your patients to delay visit to the dentist until after pregnancy?		
Yes	16	07
No	201	93
Safest trimester for provision of dental treatment.		
1st trimester	32	15
2nd trimester	155	72
3rd trimester	28	13

This study showed that the majority of gynaecologists (85%) do not advise their pregnant patients to go to the dentist during pregnancy, while 93% gynaecologists advise their patients to postpone the visit to the dentist till their delivery. Most of them (72%) considered second trimester as the safest trimester to receive dental treatment [Table 4].

DISCUSSION

Recent research in Periodontology has shown the bi-directional relationship between pregnancy and periodontal disease. Many epidemiological studies have reported a statistically significant link between periodontal infections and adverse outcomes of pregnancy.[20-24] By contrast, other researchers found no significant link between pregnancy outcomes and periodontal infections.[25-27] The causes of these inconsistent results are unknown, but there is likely to be a real variation in exposure to adverse pregnancy outcomes among the population based on complex genetic and environmental differences. Systematic reviews of this topic "Periodontal infections and adverse pregnancy outcomes" show a mild general association between periodontal infections and adverse pregnancy outcomes.[28-30] Gynaecologists, as women's health professionals, can play an important role in oral health care, especially during pregnancy and child birth. Therefore, their awareness regarding Bi-directional relationship between pregnancy and periodontal disease is important to prevent adverse pregnancy outcomes.

Dental awareness among gynaecologists may not be enough about their initial knowledge of oral diseases. There are a few studies mentioned in the literature assessing the awareness among these medical professionals. To our knowledge, this is the first published study carried out in the tertiary care hospitals of Peshawar to assess the level of knowledge of gynaecologists in regard to the Bi-directional relationship between pregnancy and periodontal disease. In general, the level of knowledge in the current survey reflected gynaecologists' unfamiliarity about the relationship between chronic periodontitis and adverse pregnancy outcomes as compared to other studies where the level of knowledge is comparatively higher.[31-34] Although the general level of the gynaecologists knowledge regarding relationship between periodontitis and adverse pregnancy outcomes in this study was unsatisfactory and there is also a minor misunderstanding among gynaecologists regarding the provision of different dental treatments during pregnancy. This is important for dentists because it is an obstacle to the best possible treatment for their pregnant patients. This misunderstanding should be clarified in order to not harm the quality of dental care due to unnecessary concerns among patients.

This study showed a low percentage (35%) of gynaecologists were aware of the link between periodontal infections and pregnancy as compared to the study which demonstrated that a high percentage (90.7%) of the gynaecologists were aware of the association between periodontal infections and pregnancy.[19] A high percentage 55% and 57% of the participants did not know that neither pregnancy increases the possibility of gingival inflammation (pregnancy Gingivitis/Pregnancy Tumour) nor that gingival/periodontal inflammation can increase the risk for both preterm labour and/or low birth weight babies respectively as compared to the studies carried out by Suri et al[35] and Raghad and hashim.[19] In a study carried out by Tarannum et al[36] nearly 68% of the gynaecologists reported that periodontal disease is the main cause for low birth weight babies which was very high as compared to our study which was only 10%.

Although the awareness of gynaecologists regarding the bi-directional relationship between periodontitis and pregnancy was low, their answers to questions aimed at assessing knowledge of the different types of dental care that can be safely given during pregnancy have been satisfactory. Proper oral care during pregnancy has always been a challenge for dental health professionals because of the potential risks to the foetus associated with dental treatment and medications commonly prescribed in dentistry. As advancement progresses in the field of health, pregnancy is no longer considered as a contraindication to provide good dental care. In our study most gynaecologists (79%) considered to perform regular cleaning (SRP) safe during pregnancy. Treatment of gums during pregnancy is absolutely essential due to the fact that hormonal changes which occur during pregnancy render the women more prone to the plaque accumulation and gingival inflammation.[37] Acute periodontal infections should be treated as soon as possible to avoid damage to the mother and foetus.[38]

Most gynaecologists (87%) said "No" in response to the question whether it is safe to take intraoral/ extraoral radiographs for a pregnant patient. Dental X-rays play an important role in the diagnosis and treatment of many dental conditions. Studies[39, 40] have stated that taking the necessary dental X-rays from pregnant women is safe and does not pose a risk to the developing foetus. However, it is recommended to use a protective lead apron and thyroid collar to protect sensitive areas. In addition, the radiation dose should be reduced as much as possible to reduce X-ray exposure in pregnant patients.[41]

The research showed that dental treatment can be provided for all trimesters of pregnancy but due to morning sickness experienced during the first trimester and postural hypotension during the third trimester; the second trimester is considered as the ideal period for delivering effective dental care.[19, 42] The second trimester is safe for dental treatment as reported by 95.9% and 98% of gynaecologists[43] as compared to our study which was 72%.

This study assesses the importance of gynaecologists, and their prenatal counselling during pregnancy plays an important role in promoting oral health. The comprehensive management of oral health programs with gynaecologists has a significant impact on maintaining oral health. An integrated team periodontologist/dentists and gynaecologists can significantly reduce the likelihood of adverse consequences during pregnancy. The increased participation of gynaecologists in oral health care programmes plays a role in improving the overall health of expectant mothers. Interactive seminars and workshops on a shared platform would provide valuable information to further enrich knowledge and enhance the partnership between periodontal disease and pregnancy outcomes. In addition, long-term research of a larger sample size is needed to assess the impact of oral health education on healthcare professionals through several integrated programmes.

CONCLUSION

It is important to maintain oral health for the well-being of pregnant patients and foetus. Interactive seminars and workshops on this topic might help in raising awareness among healthcare professionals and updating their knowledge of Perio-systemic interaction. Interdisciplinary bilateral protocols among periodontologist/dentist and gynaecologists can reduce the incidence of maternal and neonatal complications.

REFERENCES

1. Kinane D, Stathopoulou P, N. Papapanou P. Periodontal diseases. Nature Reviews Disease Primers. 2017;3:17038.
2. Ababneh KT, Abu Hwaij ZM, Khader YS. Prevalence and risk indicators of gingivitis and periodontitis in a multi-centre study in North Jordan: a cross sectional study. BMC Oral Health. 2012;12:1.
3. Albandar JM, Kingman A. Gingival recession, gingival bleeding, and dental calculus in adults 30 years of age and older in the United States, 1988-1994. J Periodontol. 1999;70(1):30-43.
4. Page RC. Oral health status in the United States: prevalence of inflammatory periodontal diseases. J Dent Educ. 1985;49(6):354-67.
5. Mariotti A. Dental plaque-induced gingival diseases. Annals of Periodontology. 1999;4(1):7-17.
6. Pihlstrom BL, Michalowicz BS, Johnson NW. Periodontal diseases. The Lancet. 2005;366(9499):1809-20.
7. D'Aiuto F, Parkar M, Andreou G, Suvan J, Brett PM, Ready D, et al. Periodontitis and systemic inflammation: control of the local infection is associated with a reduction in serum inflammatory markers. Journal of dental research. 2004;83(2):156-60.
8. Gajendra S, Kumar JV. Oral health and pregnancy: a review. New York State Dental Journal. 2004;70(1):40.
9. Page RC, Kornman KS. The pathogenesis of human periodontitis: an introduction. Periodontology 2000. 1997;14(1):9-11.
10. Apoorva S, Suchetha A. EFFECT OF SEX HORMONES ON THE PERIODONTIUM. Indian Journal of Dental Sciences. 2010;2.
11. Alchalabi HA, Al Habashneh R, Jabali O, Khader Y. Association between periodontal disease and adverse pregnancy outcomes in a cohort of pregnant women in Jordan. Clin Exp Obstet Gynecol. 2013;40(3):399-402.
12. Baskaradoss JK, Geevarghese A, Al Dosari AAF. Causes of adverse pregnancy outcomes and the role of maternal periodontal status–a review of the literature. The open dentistry journal. 2012;6:79.
13. Zachariasen RD. The effect of elevated ovarian hormones on periodontal health: oral contraceptives and pregnancy. Women & health. 1993;20(2):21-30.
14. Wu M, Chen S-W, Jiang S-Y. Relationship between gingival inflammation and pregnancy. Mediators of inflammation. 2015;2015.
15. Onigbinde O, Sorunke M, Braimoh M, Adeniyi A. Periodontal status and some variables among pregnant

women in a Nigeria tertiary institution. Annals of medical and health sciences research. 2014;4(6):852-7.

16. Komine-Aizawa S, Aizawa S, Hayakawa S. Periodontal diseases and adverse pregnancy outcomes. Journal of Obstetrics and Gynaecology Research. 2019;45(1):5-12.
17. Daalderop L, Wieland B, Tomsin K, Reyes L, Kramer B, Vanterpool S, et al. Periodontal disease and pregnancy outcomes: overview of systematic reviews. JDR Clinical & Translational Research. 2018;3(1):10-27.
18. Zi MYH, Longo PL, Bueno-Silva B, Mayer MPA. Mechanisms involved in the association between periodontitis and complications in pregnancy. Frontiers in public health. 2015;2:290.
19. Hashim R, Akbar M. Gynecologists' knowledge and attitudes regarding oral health and periodontal disease leading to adverse pregnancy outcomes. Journal of International Society of Preventive & Community Dentistry. 2014;4(Suppl 3):S166.
20. Agueda A, Ramón JM, Manau C, Guerrero A, Echeverría JJ. Periodontal disease as a risk factor for adverse pregnancy outcomes: a prospective cohort study. Journal of clinical periodontology. 2008;35(1):16-22.
21. Alves RT, Ribeiro RA. Relationship between maternal periodontal disease and birth of preterm low weight babies. Brazilian oral research. 2006;20(4):318-23.
22. Marakoglu I, Gursoy UK, Marakoglu K, Cakmak H, Ataoglu T. Periodontitis as a risk factor for preterm low birth weight. Yonsei medical journal. 2008;49(2):200-3.
23. Marin C, Segura-Egea JJ, Martínez-Sahuquillo Á, Bullón P. Correlation between infant birth weight and mother's periodontal status. Journal of clinical periodontology. 2005;32(3):299-304.
24. Toygar HU, Seydaoglu G, Kurklu S, Guzeldemir E, Arpak N. Periodontal health and adverse pregnancy outcome in 3,576 Turkish women. Journal of periodontology. 2007;78(11):2081-94.
25. Bassani D, Olinto M, Kreiger N. Periodontal disease and perinatal outcomes: A case-control study. Journal of clinical periodontology. 2007;34(1):31-9.
26. Buduneli N, Baylas H, Buduneli E, Türkoğlu O, Köse T, Dahlen G. Periodontal infections and pre-term low birth weight: A case-control study. Journal of clinical periodontology. 2005;32(2):174-81.
27. Farrell S, Ide M, Wilson R. The relationship between maternal periodontitis, adverse pregnancy outcome and miscarriage in never smokers. Journal of clinical periodontology. 2006;33(2):115-20.
28. Vergnes J-N, Sixou M. Preterm low birth weight and maternal periodontal status: a meta-analysis. American journal of obstetrics and gynecology. 2007;196(2):135. e1-. e7.
29. Vettore MV, Lamarca GdA, Leão ATT, Thomaz FB, Sheiham A, Leal MdC. Periodontal infection and adverse pregnancy outcomes: a systematic review of epidemiological studies. Cadernos de Saúde Pública. 2006;22:2041-53.
30. Xiong X, Buekens P, Vastardis S, Stella MY. Periodontal disease and pregnancy outcomes: state-of-the-science. Obstetrical & gynecological survey. 2007;62(9):605-15.
31. Muwazi L, Rwenyonyi CM, Nkamba M, Kutesa A, Kagawa M, Mugyenyi G, et al. Periodontal conditions, low birth weight and preterm birth among postpartum mothers in two tertiary health facilities in Uganda. BMC oral health. 2014;14(1):42.
32. Nutalapati R, Ramisetti A, Mutthineni RB, Jampani ND, Kasagani SK. Awareness of association between periodontitis and PLBW among selected population of practising gynecologists in Andhra Pradesh. Indian Journal of Dental Research. 2011;22(5):735.
33. Wooten KT, Lee J, Jared H, Boggess K, Wilder RS. Nurse practitioner's and certified nurse midwives' knowledge, opinions and practice behaviors regarding periodontal disease and adverse pregnancy outcomes. American Dental Hygienists' Association. 2011;85(2):122-31.
34. Rocha JMd, Chaves VR, Urbanetz AA, Baldissera RdS, Rösing CK. Obstetricians' knowledge of periodontal disease as a potential risk factor for preterm delivery and low birth weight. Brazilian oral research. 2011;25(3):248-54.
35. Suri V, Rao N, Aggarwal N. A study of obstetricians' knowledge, attitudes and practices in oral health and pregnancy. Education for Health. 2014;27(1):51.
36. Tarannum F, Prasad S, Vivekananda L, Jayanthi D, Faizuddin M. Awareness of the association between periodontal disease and pre-term births among general dentists, general medical practitioners and gynecologists. Indian journal of public health. 2013;57(2):92.
37. Singla N, Singla R. ORAL HEALTH CARE DURING PREGNANCY. Guident. 2013;6(10).
38. Weidlich P, Moreira CHC, Fiorini T, Musskopf ML, da Rocha JM, Oppermann MLR, et al. Effect of nonsurgical periodontal therapy and strict plaque control on preterm/low birth weight: a randomized controlled clinical trial. Clinical oral investigations. 2013;17(1):37-44.
39. Rainchuso L. Improving oral health outcomes from pregnancy through infancy. American Dental Hygienists' Association. 2013;87(6):330-5.
40. Kumar J, Samelson R. Oral health care during pregnancy recommendations for oral health professionals. NY State Dent J. 2009;75(6):29-33.
41. Council O. Guideline on Oral Health Care for the Pregnant Adolescent. American Academy Pediatric Dentistry. 2007;33:137-41.

42. Wilder R, Robinson C, Jared HL, Lieff S, Boggess K. Obstetricians' knowledge and practice behaviors concerning periodontal health and preterm delivery and low birth weight. American Dental Hygienists' Association. 2007;81(4):81-.

43. Govindasamy R, Narayanan M, Balaji VR, Dhanasekaran M, Balakrishnan K, Christopher A. Knowledge, awareness, and practice among gynecologists, medical practitioners and dentists in Madurai regarding association between periodontitis and pregnancy outcomes. Journal of Indian Society of Periodontology. 2018;22(5):447.