

Pregnancy and Periodontal Disease: 5-year Clinical Evaluation in Enugu, Nigeria

By

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SUMMARY

Background: Many pregnant women experience increased periodontal disease, which usually begins in the second or third month. This condition may be aggravated by pre-existing disease and poor oral hygiene. The purpose of this study was to evaluate the cases of periodontal disease seen among pregnant women referred to the Dental centres of the two Specialist Hospital in Enugu, Nigeria.

Patients and Methods: We carried out a retrospective review of 59 cases of periodontal disease seen among pregnant women referred to the Oral Surgery Unit of the two Specialist centres in Enugu, Nigeria between January 2001 and December 2005. The case notes of these patients were retrieved from the records department and evaluated. The age of the patients, time of presentation, the nutritional status and oral habits were extracted and analyzed.

Results: The age range of the 59 cases seen in the 5-year study period falls within 15 - 46 years. Seventeen patients (28.8%) were between the ages of 35 and 39 years. Patients below 20 years of age had the least number of periodontal diseases accounting for 4 (6.8%) while patients 40 years and above were 10 (16.5%). Thirty-one patients were in their third trimester representing 52.5% while 21 (35.6%) were in their second trimester and 7 (11.8%) in their first trimester. Overall, 33 (55.9%) patients were malnourished. Poor oral hygiene was evident in most of the patients accounting for 46 (77.9%) of all the cases.

Conclusion: There is a high incidence of periodontal disease among the pregnant women studied. Poverty, malnutrition, lack of education, ignorance and poor oral hygiene are possible aetiological factors.

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INTRODUCTION

There used to be an old wives tale that says "A tooth lost for every child". While it may be far fetched, it actually was based loosely on the fact that the teeth and periodontal tissues are affected during pregnancy just as other tissues in the body¹. Periodontal tissues are the gingivae (gum), the alveolus which is covered by the gingivae, the periodontal ligament and the cementum¹. Periodontal disease is caused by the bacteria and toxins in dental plaque. Dental plaque is a non-mineralized microbial deposit adhering to the tooth surface within the mucopolysaccharide matrix, which cannot be easily wiped out².

Certain conditions may have effect on gingival status and may aggravate pre-existing disease, especially in persons with poor oral hygiene. Pregnancy is one of this conditions³. In addition, there is evidence in the literature suggesting an association between periodontal diseases in pregnant women and giving birth to premature and low-birth weight infants^{3,6}.

Periodontal disease is characterized by swelling, bleeding, redness in the gum tissue and tooth mobility. If the gingivae are in good health before pregnancy, periodontal problem is unlikely to occur. Pregnancy gingivitis and periodontitis usually affects areas of previous inflammation, and unhealthy gingival tissue. Patients, who experience swelling and bleeding of their gums before pregnancy, might be at increased risk for pregnancy gingivitis and periodontitis^{2,3,5}.

A pregnancy tumour may develop from pre-existing periodontal disease^{1,3,7}. This growth, known as pregnancy epulis, appears as a large lump on the gum tissue with many deep red pinpoint markings on it. It is painless initially, becoming painful such that it interferes with mastication or if food particles collects beneath it.

Pregnancy gingivitis and pregnancy tumours may diminish after pregnancy but they do not heal completely⁸. Patients who experience periodontal problems during pregnancy should have their entire mouth examined after delivery. Literature review reveals that adequate nutrition, along with other host factors, are necessary to maintain resistance to

periodontal disease during pregnancy⁵⁻⁸. Although the role of diet and nutritional factors in development of periodontal disease is unclear, it is known that the defence mechanisms of the gingival tissues and saliva can be affected by nutritional intake and status⁵. For example, healthy gingival tissue normally prevents penetration of bacteria that can lead to gingivitis. Studies have shown that, deficiencies of vitamin C, folic acid, and zinc may increase the permeability of gingival tissue, making it more susceptible to the bacterial plaque accumulation that causes periodontal disease. Studies examining vitamin C and calcium intake found that individuals with low intakes of vitamin C and calcium are at increased risk for periodontal disease^{9,10}.

In Nigeria, literature on periodontal disease during pregnancy is scarce. The purpose of this article is therefore to evaluate the cases of periodontal diseases seen among pregnant women in Enugu, Nigeria.

PATIENTS AND METHODS

We carried out a retrospective study of 59 cases of pregnant women with periodontal disease. The study took place at the Dental clinic of two Specialist centres in Enugu Nigeria, which include the Ntasiobi Specialist Hospital Enugu and Federal School of Dental Technology and Therapy Enugu, Enugu State, Nigeria over a 5-year period from 2001 to 2005. These patients were referred to the units by Obstetricians and Gynaecologists, medical practitioners and health centres in the catchments area of the hospitals. The case notes of these patients were retrieved from the records departments; relevant data extracted and evaluated include the patients' dental habits, socio-demographic data, onset of symptoms, period of pregnancy and time interval before presentation. Clinical and laboratory findings were also noted. In determining the nutritional status of the patients the following laboratory investigations were considered useful: haemoglobin, packed cell volume, blood glucose, serum albumin and electrolytes. The data collected were entered into the Microsoft Excel package 2003 for the purpose of analysis and generation of graphic representations.

RESULTS

Fifty-nine pregnant women with periodontal disease were seen during the 5-year study period. All the patients involved in this study were Nigerians. Most of them came from the lower economic class of the society with little

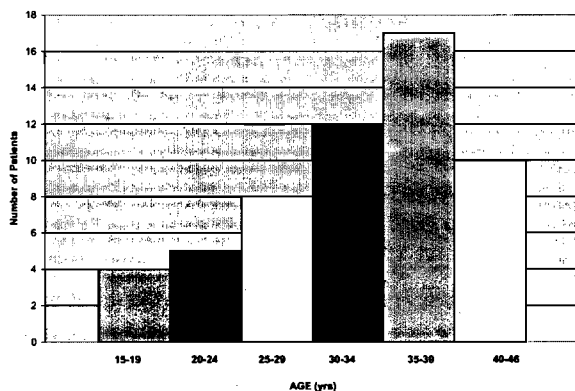
or no formal education and lived at subsistence level. There was neither history of alcohol and tobacco intake nor of para-functional dental habits (Table 1).

Table 1
Health Problems Associated with Dental Habits amongst 59 Pregnant Women

Associated health problems/habits	Yes (%)	No (%)	Total
Alcohol intake	0 (0)	59 (100)	59
Tobacco intake	0 (0)	59 (100)	59
Para functional dental habits	0 (0)	59 (100)	59
Poor Oral Hygiene	45 (76.3)	14 (23.7)	59
Anaemia	39 (66.1)	20 (33.9)	59
Hypoproteinaemia	36 (61.1)	25 (38.9)	59
HIV	2 (3.4)	57 (96.6)	59

Seventeen (28.8%) of all the cases with periodontal diseases were between 35 and 39 years. The age range falls within 15-46 years with mean age of 34 ± 7.2 years. Figure 1 illustrates the age range with the corresponding number of patients recorded.

Figure 1
Age Distribution of the Patients of Periodontal Disease



Considering the gestation age at time of presentation, 31 patients were in their third trimester representing 52.5% while 21 (35.6%) were in their second trimester and 7 (11.8%) in their first trimester. Some of the patients showed signs of malnutrition and many of them were suffering from malaria. Poor oral hygiene was evident in 76.9% of the

patients. This is characterized by presence of subgingival calculus, halitosis, bleeding gums and excessive salivation. Thirty-three patients (55.9%) were considered malnourished based on the laboratory result recorded. This included 36 (61%) patients who had hypoalbuminemia with mean 3.2g/dl as against the normal value of (3.6-5.2g/dl), and Hypoproteinaemia (mean 5.8g/dl) as against the normal value of (6.2-8.0g/dl). Iron deficiency anaemia was present in 39 (66.1%) patients who had haemoglobin levels below 10g/dl in comparison to those with mean haemoglobin of 10.96g/dl observed in this area. Two (3.4%) patients were HIV positive. Five patients (8.5%) had elevated blood glucose while the blood pressure measurements were up to 170/100 mm/Hg in 7 patients (11.8%).

DISCUSSION

Several studies have shown that periodontal disease is strongly associated with poor oral hygiene^{7,11,12,13} and is usually aggravated during pregnancy. In this study, out of the 59 pregnant women who presented with periodontal disease, 45 (76.9%) had poor oral hygiene which is characterized with severe presence of subgingival calculus, halitosis, bleeding gums and excessive salivation. Tilakaratne et al.¹² in their study observed that poor oral hygiene is a

predisposing factor to the development of periodontal disease during pregnancy. They maintained that pregnant women should continue with regular dental cleaning and check-ups to avoid periodontal disease, which may in turn affect the fetus¹¹.

In the past few decades, major advances have been made in the elucidation of the aetiology, pathogenesis and treatment of periodontal disease during pregnancy^{13,14}. Moore et al¹³ observed that pregnant women who smoke had a higher proportion of periodontal disease than non-smokers irrespective of their different demographic variables. This is because smoking increases the risk of developing periodontal disease. None of our patient was a smoker as could be noted from the sociodemographic data available. We observed that the risk of developing periodontal disease during pregnancy was strongly associated with poor oral hygiene and malnutrition. This study is in line with the findings of other authors^{8,10,12,13,14}.

In Nigeria, as is often the case with other African and developing countries, maintaining good oral hygiene has always been a problem because of ignorance, poverty and poor diet. The stages of the pregnancy also play an important role in development of periodontal disease during pregnancy. Madianos et al.¹² observed that pregnant women at the late stage of their pregnancy are more likely to complain of dental problem than those at the early stages. The result of our study showed that periodontal diseases are commoner in the late stages of pregnancy and the older patients are at greater risk. This could be as a result of long time presence of plaque in the neglected oral cavity which can act as a reservoir for both bacterial products and inflammatory cytokines which potentates periodontal disease. It was also observed from this study that most of the patients had haemoglobin levels below 10g/dl in comparison to those with mean haemoglobin of 10.96g/dl observed in this area. In addition to low haemoglobin concentration, most patients were malnourished considering the low level of essential amino acids recorded. Other studies have shown that, deficiencies of vitamin C, folic acid, zinc and calcium may increase the

permeability of gingival tissue, making it more susceptible to bacterial plaque accumulation that causes periodontal disease^{9,10}.

HIV infection is also a risk factor to development of periodontal diseases because of immune depression. Murray¹⁵ in his study observed that a multitude of oral lesions, including periodontal disease, have been discovered in individuals infected with the human immunodeficiency virus (HIV). However 2 (3.4%) out of 59 patients seen in this study are not enough for valid conclusions. Nutritional status is also linked to immune response. Nutritional deficiencies contribute in weakening the resistance of oral tissues to plaque bacteria, causing increasing inflammation that leads to periodontal disease^{10,16}. With periodontal infection, the ability of the oral tissues to utilize nutrients is altered, thus interfering with normal healing and tissue repair^{16,17}.

CONCLUSION

The findings of this study suggest that a vicious circle of poverty, malnutrition, lack of education, ignorance and poor oral hygiene are contributing factors to the high incidence of periodontal disease among pregnant women in this environment. Therefore to prevent an oral inflammatory process from developing into a full blown periodontitis with possible severe consequences on pregnancy outcome, expectant mothers should receive good counselling and regular professional oral hygiene and care throughout the pregnancy period.

REFERENCES

- 1 Kinane DF. Aetiology and pathogenesis of periodontal disease. *Ann R Australas Coll Dent. Surg.* 2000; 15:42-50
- 2 Mitchel DA, Mitchel L. *Clinical Dentistry.* 3rd Edn. Oxford University Press. Inc. New York. 2003: 36-37
- 3 Alwaeli HA, Al-Jundi SH. Periodontal disease awareness among pregnant women and its relationship with socio-demographic variables. *Int J Dent Hyg.*

- 2005; 3(2): 74-82
- 4 Yeo BK, Lim LP, Paquette DW, Williams RC. Periodontal disease the emergence of a risk for systemic conditions: pre-term low birth weight. *Ann Acad Med Singapore*. 2005; 34(1): 111-6
 - 5 Louro PM, Fiori HH, Filho PL, Steibel J, Fiori RM. Periodontal disease in pregnancy and low birth weight. *J Pediatr (Rio)*. 2001; 77: 23-8
 - 6 Tucker R. Periodontitis and Pregnancy. *J R Soc Health*. 2006; 126(1): 24-7
 - 7 Armitage GC. Periodontal disease and pregnancy: discussion, conclusions, and recommendations. *Ann Periodontol* 2001 Dec; 6(1):189-92
 - 8 Meneghini C, Battaglia T, Niccoli A. Periodontal pathology during pregnancy. *Clin Ter*. 2003; 154: 105-9
 - 9 Cindy F. Ovard R.D. Gingivitis and Periodontitis. *Gale Encyclopedia of Nursing and Allied Health*. The Gale Group Inc. Gale, Detroit. 2002
 - 10 Moore S. Ide M, Coward PY et al. A prospective study to investigate the relationship between periodontal disease and adverse pregnancy outcome. *Brit Dent J* 2004; 197: 251-258.
 - 11 Tilakaratne A, Soory M, Ranasinghe AW et al. Periodontal disease status during pregnancy and 3 months post-partum, in rural population of Sri-Lankan women. *J Clin Periodontol* 2000; 27: 787-92.
 - 12 Madianos PN, Lieff S, Murtha AP et al. Maternal periodontitis and prematurity. Part 11: maternal infection and fetal exposure. *Ann Periodontol* 2001 Dec; 6(1):175-82
 - 13 Moore S, Randhawa M. Ide M. A case control study to investigate an association between adverse pregnancy outcome and periodontal disease. *J Clin Periodontol* 2005; 32: 1-5.
 - 14 Ganjendra S, Kumar JV. Oral health and pregnancy: a review. *N Y Dent J* 2004; 70: 40-4.
 - 15 Murray PA. HIV disease as a risk factor for periodontal disease. *Compendium* 1994; 15(8):1052, 1054-63.
 - 16 Krall EA, Wehler C, Garcia RI, et al: Calcium and vitamin D supplements reduce tooth loss in the elderly. *Am J Med* 2001; 111:452-6
 - 17 Nishida M, Grossi SG, Dunford RG, et al: Dietary vitamin C and the risk for periodontal disease. *J Periodontol* 2000; 71:1215-23.