AFRICAN JOURNAL OF MEDICINE
and medical sciences

VOLUME 31, NUMBER 2 JUNE 2002

EDITOR:
B. O. OSOTIMEHIN

ASSISTANT EDITOR:
A. O. UWAIFO

ISSN 1116 — 4077

Afr. J. Med. med. Sci (2002) 31, 119-121

Prevalence of periodontal pocketing and tooth mobility according to tooth types in Nigerians – a pilot study

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Summary

The aim of the present study was to evaluate the occurrence of periodontal pocketing and tooth mobility according to the tooth types in the mouth. There is a paucity of knowledge concerning which tooth types are more prone to periodontal disease from the review of literature. The study sample comprised 255 subjects, age ranged 16 years to 74 years. These subjects were those referred to the Periodontology Clinic of the University College Hospital, Ibadan, Nigeria, for one form of periodontal disease or the other. All the teeth were tested for periodontal pocketing using William's periodontal probe (Astir Intermedica, Kensington, London) and for tooth mobility using the Miller's Mobility Index method. The study showed that prevalence of tooth mobility is in this descending order – lower incisors, upper incisors, upper first molars, upper second molars, lower first and second molar, the premolars and lastly, the canines with the least occurrence on the upper left canines. This order is slightly different for prevalence of periodontal pocketing. The teeth most affected by pocketing were the upper second molars, followed by upper first molars, lower second molars with the least being the canines. It is suggested that exceptional care be given to these most susceptible teeth for periodontal disease in the mouth in order to prevent the development of irreversible damage of the periodontium

Keywords: *Prevalence, periodontal, pocketing, mobility, tooth types, Nigerians*

Résumé

Le but de l'étude actuelle était d'évaluer la fréquence de parodontal et la mobilité de dent selon les types de dents dans la bouche. Il y a une indigence de connaissance concernant les types de dents qui sont inclinés à la maladie parodontale à travers des revues de document. Le sondage constitue 255 sujets âgé des 16 à 17 ans. Ces sujets sont ceux référés à la clinique parodontal du centre hospitalier universitaire d'Ibadan, Nigeria pour une forme de maladie parodontal et autre. Tous les dents sont examinés pour poches parodontales en employant la sonde parodontal de William (Astu Intermedia, Kesington Londre) et pour la mobilité de dent, la méthode indexe de mobilité de Miller. L'étude a montré que la fréquence de mobilité de dent est dans cet ordre descendant – incisive inférieure, incisive supérieure, les premiers molaires en haut, les deuxième en haut, le première et deuxième molaire en bas, les prémolaire et dernièrement les canines avec une fréquence las plus faible sur les canines gauchère en haut. Cet ordre est un peu différent pour la fréquence la plus faible sur les canines gauchère en haut. Cet ordre est un peu différent pour la fréquence de "poches parodontales" les deuxièmes molaires en bas et les dernières étaient les canines. Il est proposé qu'un soin exceptionnel doit être donner à ces dents qui sont plus susceptible à la maladie parodontal d'éviter le développement de dommage irréversible de parodontium.

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Introduction:

Despite numerous reports on the prevalence of periodontal pocketing and tooth mobility in human populations, very few detail the occurrence of these signs according to the individual teeth within the mouth. It is generally agreed that the pathologic changes that accompany periodontal disease are associated with presence of oral microorganisms in the gingival sulcus [1]. These organisms are capable of synthesizing harmful products that cause damage to epithelial connective tissue cells and later on the alveolar bone, resulting in bone loss. Although, bacterial plaque has been demonstrated to be the major aetiologic factor in periodontal diseases [2,3,4] the presence of calculus is of great concern to the clinician because it is always being covered by bacteria [5,6]. These calcified deposits play a major role in maintaining and accentuating periodontal disease by keeping plaque in close contact with the gingival tissue. Supragingival calculus has been found to be most abundant in the lingual area of the mandibular incisors opposite the Wharton's duct, and the buccal surfaces of the maxillary molars, opposite the Stensen's duct. With this differential accumulation of plaque and calculus in the mouth, it is probable that there would be a differential incidence of periodontal disease in the mouth. From the review of literature, similar studies were conducted about 3 or 4 decades ago [2,7,8]. There is need therefore to review these findings and also evaluate if the differential pattern of calculus accumulation translates to differential prevalence of periodontal pocketing and tooth mobility.

Materials and methods

A total of two hundred and fifty-five patients who were referred to the Periodontology Clinic of the University College Hospital, Ibadan, Nigeria, during the study period from November 1996 to March 1997 were consecutively recruited into the study. The patients were however matched for gender. Verbal consent as regards willingness to participate in the study was obtained from all the subjects.

Demographic data namely age, sex and occupation were collected. Information sought also included medical and past medical history as well as past dental history. Intraoral examination was then carried out with adequate sterile instruments by the author, on the dental chairs under fluorescent light. Pocket depths were measured using the William's periodontal probe (Astir Intermedica, Kensington, London) and only teeth exhibiting pocket depths exceeding 4mm were recorded as having periodontal pocket. Bidigital examination with gloved hands were used to assess tooth mobility employing the Miller's Mobility Index criteria [5]. Patients exhibiting grades 1-3 were regarded as having tooth mobility.

A poster presentation at the Conference, Periodontics in Practice, Myth and Reality, Present and Future, at the Glasgow Royal Concert Hall, 17th - 19th May, 2001

Miller's Mobility Index:

Grades	*Criteria*
0	No mobility
1	Slight mobility
2	Moderate mobility up to 1mm in a horizontal direction
3	Mobility greater than 1mm in a horizontal direction, rotation or depression.

All the teeth present in the mouth were examined recording the occurrence of these two clinical signs as being present or absent.

In this study, the ages of the subjects were recorded but age was not taken into consideration because majority of the uneducated adults in the sample did not know their accurate ages.

The data were analyzed using Epi-info version 6.

Results:

The study sample consisted of 255 subjects, 128 males and 127 females. Their ages ranged from 16 years to 74 years. Twenty-nine subjects. (11.37%) were under the age of 20 years (Table 1) while 98 (38.43%) were in the 21-30 years age group. Figure 1 shows the prevalence of tooth mobility according to the tooth types in the upper and lower jaws.

Table 1:

Age Group (yrs)	Male	Female	Total	%
<20	8	21	29	11.37
21-30	47	51	98	38.43
31-40	28	15	43	16.87
41-50	22	13	35	13.73
51-60	10	15	25	9.80
>60	13	12	25	9.80
Total	128	127	255	100

X2 = 13.27 *P>0.05*

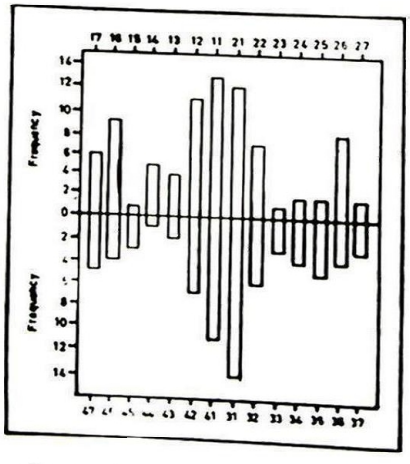

Fig. 1: *Prevalence of Tooth Mobility according to tooth types (Upper and Lower jaws)*

The frequency of occurrence of tooth mobility was as follows in descending order: mandibular incisors; maxillary incisors; maxillary first molars; maxillary second molars; mandibular right first and second molars; mandibular left first and second molars; the premolars in the four quadrants followed by the canines in the four quadrants with the least prevalence in relation to maxillary left canine.

41,42,31,32; 11,12,21,22; 16,26; 17,27; 46,47; 36,37; 14,15,24,25; 34,35; 44,45; 13,23,33,43.

Figure 2 shows the prevalence of periodontal pocketing according to tooth types in the upper and lower jaws. In descending order, the prevalence rates were as follows: maxillary second molars; maxillary first molars; mandibular central and lateral incisors; maxillary central and lateral incisors; mandibular second molars; mandibular first molars; the premolars; the canines.

17,27; 16,26; 41,42,31,32; 11,12,21,22, 47,37; 46,36: 14,15,34,35; 24,25; 44,45; 13,23,33,43.

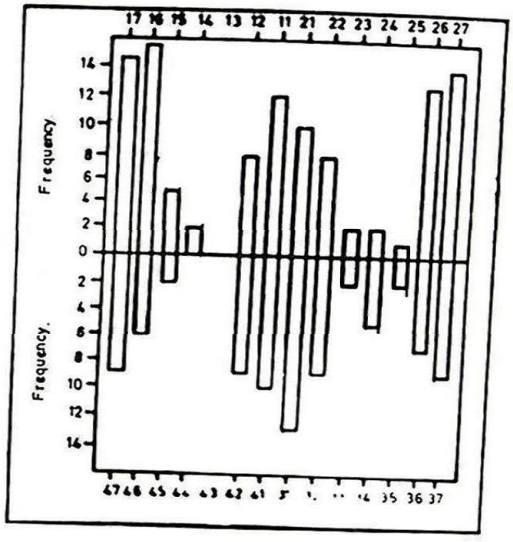

Fig. 2: *Prevalence of periodontal pocketing according to tooth types (Upper and Lower jaws)*

Discussion

Periodontal disease is a group of aetiologically closely related different diseases with different natural courses, prognosis and response to conventional therapy [9]. It is an established fact that the primary aetiologic agent in periodontal disease is the accumulation of pathogenic bacteria in the plaque. As such, areas in the mouth where the accumulation tend to be highest seem to be more susceptible to periodontal breakdown, which leads to periodontal pocketing and tooth mobility. The destruction of the periodontal attachment results in a periodontal pocket [6,10]. The results of this study illustrate both the positive correlation between plaque and periodontal disease as well as the progressive nature of destructive periodontal disease. The prevalence of tooth mobility was highest on the lower centrals and laterals, the upper first molars. This is slightly contrary to the reports by Macgregor and Sheiham [8] who found that upper first molars were most commonly affected followed by lower central incisors and upper central incisors. From these reports however, it may be concluded that prevalence of periodontal disease is associated with the dates of eruption of teeth, and the longer the teeth are in the mouth, the greater the chance of pocketing and tooth mobility. In a similar report [1] the teeth most severely affected by periodontal disease are the lower centrals and laterals and the upper molars (first, second and third). A possible explanation for this is that there is a positive correla-

tion between plaque and periodontal disease. This is because the highest accumulations of plaque are found on teeth opposite the salivary glands – the Stensen's and the Wharton's ducts, and these teeth are the maxillary first and second molars and the lower incisors.

Gingivitis was reported to be more severe in the upper arch than in the lower arch [2] while it was more severe in the lower arch than in the upper in the lingual areas. Similar findings were observed in this study, since periodontal disease is invariably always preceeded by gingivitis. The teeth, least affected by periodontal disease were the premolars (first and second) and the canines especially the maxillary ones. This is similar to the report by Carranza [1].

Conversely, Ana and Kumar [11] working in the same environment, found that the prevalence of advanced destructive periodontal disease was more in canines (5.3%) than in incisors (1.9%).

In general, the severity of periodontal disease follows the intraoral pattern of subgingival calculus. The incisors and molars are more severely involved than the premolar and canine areas [2]. Bone loss in the maxilla was also reported to be generally more severe than that in the mandible except for the anterior region where the situations reversed [13]. The findings in this present study revealed similar patterns.

Another observation from this study was that there is a greater tendency to periodontal disease on the right half of the arch than on the left. This may be attributed to the difficulty that most right-handed persons have in brushing the right half of the mouth. Similar observation was also reported by Carranza [1]. Contrary to this finding however, was a report by Macgregor and Sheiham [8] who reported equal distribution of pockets by tooth type on either side of the mouth with the exception of upper first molars in the 10-19-year age group.

In conclusion, this study has confirmed that the pattern of periodontal pocketing and tooth mobility – the two major clinical signs of advanced periodontitis-show a progressive nature of the disease as they affect most frequently, the teeth that first erupt into the mouth and also show an association with areas of highest accumulation of plaque and calculus in the mouth.

It is therefore suggested that special care should be targeted at this susceptible teeth by hygienists and periodontists when prophylactic scaling and polishing is being carried out on patients. Oral hygiene instructions should also emphasize special attention to these teeth by the patients on home care basis. The small sample size of this study, being a pilot survey, may however limit the validity of these results. Future studies should examine a much larger sample size covering representative parts of the country.

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