

# Denture Hygiene of the Elderly Denture Wearers in South East Local Government Area in Ibadan, Nigeria

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## Abstract

It has been observed that patients provided with partial dentures accumulate more plaque on the abutment teeth. Likewise the fitting surfaces of dentures become coated with plaque. It is the objective of this study to investigate the hygiene condition of dentures worn by some elderly people in South East Local Government Area Ibadan Nigeria. Two trained and calibrated examiners examined the oral cavity and dentures of 39 elderly individuals who were 65 years and above, living in South East Local Government area in Ibadan Nigeria. They were examined using a mouth mirror, a blunt probe of diameter 0.5mm and a W.H.O assessment form, modified to include denture hygiene criteria, developed by the authors. The findings were recorded by two trained recorder clerks. The results highlight the poor hygiene condition of dentures used by some elderly in this local government area. Thirty two (82.1%) of them had plaque or calculus on their dentures. Only 17.9% had clean dentures and 38.1% had calculus on their dentures. Denture stomatitis was observed in 15.4% of denture wearers. Denture wearers among the elderly individuals in south East Local Government area in Ibadan exhibited inadequate denture hygiene conditions. In spite of poor denture hygiene which is known to contribute to denture stomatitis, the prevalence of denture stomatitis was very low in the study group. The significance of these findings is that other conditions need to be present to facilitate initiation and progress of denture stomatitis.

**Keywords:** Plaque, denture hygiene, denture stomatitis, periodontal disease, calculus.

## 1. Acknowledgement

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## 2. Introduction

The proportion of the population which is elderly is increasing all over the world (Morley J.1999). Also in many Western European Countries the proportion who retain a natural dentition is also increasing (Office of Population Census and Surveys 1991). The ultimate goal of prevention in the elderly is to prevent disability and discomfort as a result of dental problems and provide satisfaction (Steele J.G. 1996). The prevention of dental diseases, though an essential step, yet is not the only consideration by which this can be achieved (Steele J.G. 1996). This quite often is not achieved by the natural dentition alone. In quite a number of cases partial dentures or complete dentures are often incorporated into the treatment plan to be able to meet this goal (Steel J.G. 1996). The purpose of a denture therefore is to aid in function, provide for the patients aesthetic needs and prevent the development of soft tissue lesions (Steele J.G. 1996).

It has been observed that patients provided with partial dentures accumulate more plaque on the abutment teeth (Addy M. et al. 1979). Similarly the fitting surfaces of dentures become coated with plaque. Plaque accumulation both on abutment teeth and denture is increased by day and night wear of dentures (Jenkins W.M.M. 1996). It has been shown that microbial composition of plaque in denture wearers changes more rapidly, resembling the 4-9 day old plaque of non denture wearers by the second day (Jenkins W. M .M 1996). These factors contribute to the common observation of gingivitis around abutment teeth of denture wearers (Jenkins W.M.M. 1996). Various

micro-organisms have been identified in denture plaque including candida species, staphylococcus, aureus, P. aeruginosa, E. coli, K. pneumoniae, Alpha streptococcus, Beta streptococcus, Group D streptococcus and assorted gram (-) rods (Shay K. 2000). Species of Fusobacteria which excrete volatile sulphur compounds associated with halitosis have also been identified (Shay K 2000). In some denture plaque samples of spirochetes have been observed (Nakuo M et al 1987).

Various studies in denture wearers particularly in the elderly, demonstrated denture stomatitis and accumulation of soft debris and calculus on their dentures (Shay K 2000). No such investigation to the authors knowledge has been carried out among the elderly population in Nigeria.

### 3. Aims And Objectives

It is therefore the aim of this study to investigate the hygiene condition of dentures worn by some of the elderly people in South East Local Government Area in Ibadan Nigeria.

### 4. Subjects And Methods

The study was conducted on 39 elderly individuals who were 65 years old and above (World Health Organization 1984), living in various wards in South East Local Government Area in Ibadan Nigeria. An elderly male and female individual was included in the study, regardless of whether he or she is dependent or independent, handicapped, dentate or edentulous, if only he is wearing a denture. This was part of a study on 690 elderly individuals who were randomly selected to participate in a bigger study. All denture wearers (39) were examined.

The instrument of measurement included a W.H.O. assessment form (World Health Organization 1986), modified to include a denture hygiene criteria developed by the author. This denture hygiene index ranged from seeing no plaque or debris when a probe is run gently on the fitting surface of a denture to calculus on a denture. This is illustrated in the table below (Table I).

Discrete areas of redness and ulcers beneath dentures and redness covering the entire denture bearing areas as well as areas of redness associated with papillary hyperplasia were regarded as denture stomatitis.

The, intra-oral examination and examination of dentures of participants were carried out concurrently. First the demographic data of participating elderly individuals were taken and he or she was examined by one of the two trained and calibrated examiners for denture stomatitis, using a mouth mirror, a blunt probe of diameter 0.5mm, and natural light. Also two trained recorder clerks recorded all the findings of the examinations on the assessment forms.

Two trained and calibrated examiners examined the fitting surfaces of the dentures of the elderly individuals using the above denture hygiene index, a blunt probe of diameter 0.5mm and day light.

**Data Management:** Collation and verification of data was done on daily basis, whilst computer data entry was carried out after the required number of elderly have been seen. The data was analyzed using the SPSS 15 computer software as well as manually.

### 5. Result

Among the participants 10 were females and 29 were males. Out of the 39 denture wearers 29 had partial dentures and 8 had complete dentures, either in the upper or lower jaws and (2) had complete dentures in both jaws. Seven (17.9%) had clean dentures with no debris or plaque on dentures when the probe was run over the fitting surfaces of the dentures whilst thirty-two (82.1%) denture wearers had plaque or calculus on their dentures. Dentures of fifteen (38.5%) denture wearers were classified as having very poor hygiene condition with calculus on the dentures. (Fig. 1) Dentures of two (5.1%) of the elderly individuals had much visible plaque covering more than  $\frac{1}{2}$  the surface of the dentures whilst nine (23.1%) had visible plaque covering less than half the surface of the dentures. Six (15.4%) had plaque not seen with the naked eye but detected by the use of a dental probe (Figure 1).

Among the total number of elderly participating in the study 6 (15.4%) had denture stomatitis.

There was good agreement between the two examiners for denture hygiene status, the percentage agreement was 95%.

### 6. Discussion

Plaque as the primary etiologic factor in the initiation and progress of gingivitis and periodontitis, the two major periodontal diseases has been established beyond doubt (Lovegrove J.M. 2004). Patients provided with partial removable dentures (PRD) have a tendency to accumulate more plaque on abutment teeth (Addy M et al 1979). Calculus promotes plaque accumulation and retention of irritant bacteria deposits which are injurious to the periodontal tissues (Cate J.M. 1989). Also in various studies, the Periodontal Index (PI) has shown an inverse relationship with oral cleanliness (Sheiham A. 1986). Eighty two percent (82.1%) of the elderly people examined, demonstrated inadequate denture hygiene and 38.5% of them had calculus on their dentures. Calculus on dentures is a sign of oral hygiene neglect. Previous studies in this group demonstrated poor oral hygiene and poor periodontal health (Taiwo J.O. et al 2004). The findings therefore is a reflection of the poor oral hygiene status often demonstrated by various studies in Nigeria (Kubota K et al 1988, Taiwo J.O. 1993). Mechanical denture cleaning is not always effective, consequently the use of chemical denture cleansers have been introduced (Sharp E.W. et al 1985). An effective denture cleanser must have the ability to remove microbial plaque formed and prevent its rebuild. Also it must be able to remove mucin, food debris, calculus and stains and it must not cause damage to the denture base material (Sharp E.W. et al 1985).

Chemical denture cleansers are classified into the following groups: alkaline peroxides, alkaline hypochlorides, acids, disinfectants and enzymes. Enzyme denture cleansers are the most recommended (Sharp E.W. et al 1985). In Nigeria commercially marketed denture cleaning materials are not readily available and many denture wearers especially, those from disadvantaged background use mechanical cleaning method or water for cleaning their dentures.

Both oral hygiene and denture hygiene are of utmost importance in the prevention of caries and periodontal disease of abutment teeth and consequently the prevention of loss of these teeth (Yeung A.L. et al 2000). Maintaining the health of the abutment teeth is of economic importance to the patient as well as to the dentist (Mishima H et al 1999). A previous study in this group demonstrated very low caries experience (14.6%) with 0.72% of them with root or cervical caries (Taiwo et al 2006).

Micro-organisms have a tendency to adhere to dentures (Kulak Y et al 2009). Denture surface irregularities particularly encourage this. Despite an outward smooth appearance, these appliances have pockmarked surface when viewed under microscopic magnification (Kulak Y et al 2009). Among the micro-organisms associated with denture plaque are the fungal organisms, of which *Candida albicans* is the most implicated (Egusa H et al 2000). Although *Candida albicans* has been identified as the main aetiologic agent, of denture stomatitis, the increase in the incidence of immune compromised diseases in the community, has resulted in the emergence of non-*albicans* candida species as causative agents of this disease (Egusa H et al 2000). Denture stomatitis is ascribed to trauma from ill fitting dentures, poor oral hygiene, continuous denture wear (day and night), poor denture hygiene, systemic factors, use of various pharmacological agents and smoking (Felon M. R. et al 1998). In this study only 15.4% had denture stomatitis despite their poor denture hygiene status. This is a confirmation that other conditions may contribute to the initiation and progress of denture stomatitis.

## 7. Conclusion

1. Denture wearers among the elderly in South East Local Government area exhibited inadequate denture hygiene and calculus which is a sign of oral hygiene neglect was observed in a high percentage of denture wearing elderly participants.
2. Even though denture hygiene of denture wearing elderly was very poor the prevalence of denture stomatitis was low.
3. Their poor denture hygiene status is a reflection of the poor oral cleanliness of the community they come from.

## 8. Recommendation

There is need to educate denture wearers in this community about the importance of denture hygiene and its impact on the health, quality and longevity of their teeth.

Also clinicians should educate denture wearers on the proper method of cleaning dentures using a combination of mechanical and chemical methods.

It is important to further investigate why a high percentage of denture wearers despite such extremely poor denture hygiene were free from denture stomatitis.

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**Table: I Denture Hygiene Index**

Code 0 - Denture is clean with no plaque or debris when a probe is run gently on the fitting surface of the denture (surface in contact with the oral mucosa) as the highest score.

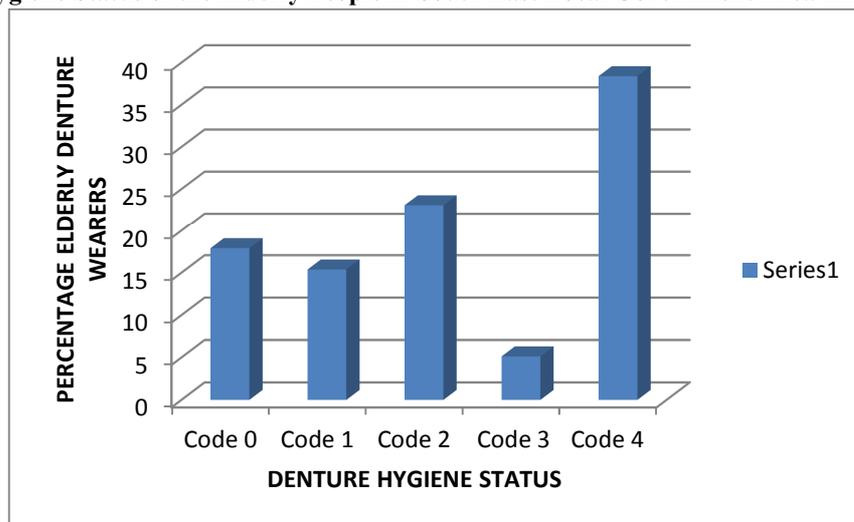
Code 1 - Denture has little plaque not visible to the naked eye but can be detected when a probe is run gently on the fitting surface of the denture, as the highest score.

Code 2 - Denture has much visible debris/ plaque covering less than ½ of the fitting surface of the denture, as the highest score.

Code 3- Denture has much visible debris/plaque covering more than half the fitting surface of the denture as the highest score.

Code 4 – Denture has calculus on the fitting surface of the denture as the highest score.

**FIG. 1: Denture Hygiene Status of the Elderly People in South East Local Government Area in Ibadan.**



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