

Assessment of denture cleaning habits and the various denture cleaning methods used by the elderly people of south coastal Karnataka – A short study

¹Dr. Bala Saraswati Bhat, Assistant Professor, Department of Prosthodontics, Dr. DY Patil Vidyapeeth, Pimpri,Pune,Maharashtra,

²Dr. Deeksha Gupta, Reader, Department of Prosthodontics, MP Dental College and ORI, Vadodara Gujarat

³Dr. Seema Marathe, Assistant Professor, Department of Prosthodontics, Dr. DY Patil Vidyapeeth, Pimpri,Pune,Maharashtra,

⁴Dr. Namrata Shah Naidu, Reader, Department of Prosthodontics, KM Shah Dental college and Hospital, Vadodara Gujarat.

⁵Dr. Himanshu Arora, Reader, Department of Prosthodontics, MP Dental College and ORI, Vadodara Gujarat

Corresponding Author: Dr. Bala Saraswati Bhat, Assistant Professor, Department of Prosthodontics, Dr. DY Patil Vidyapeeth, Pimpri,Pune,Maharashtra,

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Abstract

The accumulation of stains and soft and hard debris on removable dentures may have undesirable effects on the patient’s oral health and esthetics. Thus it is imperative on dentist’s part to instill and evaluate denture hygiene habits in patients especially the elderly. 100 patients of 70 years and above age were questioned on various aspects of denture hygiene and denture maintenance. It was observed that cleaning denture with brush and tooth paste at least once a day was the most common practice. It was also observed that the patients did not give any history of denture stomatitis with this denture routine.

Keywords: Complete dentures, Denture Hygiene, oral hygiene, denture cleaning tablet

Introduction

Complete dentures are the most common treatment for total loss of teeth in a dental arch. Microbial plaque scraped from the tissue surface of a denture serves as a significant cofactor in the pathogenesis of denture stomatitis¹. Artificial teeth play a pivotal role in restoring the esthetics and functions of a complete denture patient, by replacing the lost natural teeth². Care of dentures and the mucosal tissues of the edentulous mouth is important for overall health, especially in older persons. In addition, there are greater social concerns of mouth malodor due to

unclean oral prosthesis in older person especially who have any compromised systemic status³.

Unclean dentures causing or contributing to oral mucosal disease and/or impairment in eating, therefore, may have a more profound effect on a frail elder than on a younger, healthier person⁴. A routine denture cleaning regimen should be designed to remove and prevent re-accumulation of microbial plaque and also to remove mucin, food debris, calculus, and exogenous discoloration.⁵

Patients should be instructed to rinse their dentures and their mouths after meals whenever possible. The mucosal surfaces of the residual ridges and the dorsal surface of tongue also should be brushed daily with a soft brush; denture cleansers may also be used⁶. However, it has been observed that the majority of denture wearers do not pay necessary attention to the cleanliness. This may be due to decreasing manual abilities due to advanced age⁷.

Lesions of the oral mucosa associated with wearing of removable dentures may represent acute or chronic reactions to microbial denture plaque, a reaction to constituents of the denture base material, or a mechanical denture injury. The lesions constitute a heterogeneous group with regard to pathogenesis. They include denture stomatitis, angular cheilitis, traumatic ulcers, denture irritation hyperplasia, flabby ridges, and oral carcinomas⁸.

Regular and efficient hygiene procedures play a major role in the maintenance of oral health and are important for the long-term success of removable prosthodontic treatment. Improperly cleaned dentures may cause halitosis, poor and inflammatory changes of oral mucosa such as denture-induced stomatitis

Thus this study evaluates the attitude and awareness among the elderly population towards denture cleanliness, tissue maintenance and denture maintenance.

Aims and Objectives

- To determine the frequency of denture cleaning.
- To determine the association between gender and denture cleanliness.
- To investigate the method of choice for denture cleaning.
- To investigate if the subjects were instructed by the clinicians on denture cleanliness.
- To find the association between habits like smoking and tobacco and denture cleanliness.
- To find the association between denture cleaning habits and related tissue reaction..

Study Design

This was a questionnaire based study conducted on 100 out patients for a period of 1 month. Out of 100 subjects, 46 were male and 54 were female subjects.

Inclusion criteria

1. Complete denture patients wearing dentures since at least 2 years
2. Age of subjects: 70 years and above
3. Systemically healthy patients
4. Mentally motivated subjects falling in Philosophical type according to M.M. House.

Exclusion criteria

1. Denture patients suffering from motor disorder, metabolic disorder and other age related diseases.

Methodology

An informed consent was obtained from all patients before starting with the study. The questionnaire was approved by a statistician to collect information regarding the habits, frequency and various methods of denture cleaning used by the subjects. The questionnaire was given to the subject in their local language.

The dentures were visually examined and scored based on their cleanliness according to studies conducted by Hoad-Reddick et al⁹:

- **Score 1** (clean): Dentures showed no soft/hard debris or stain.
- **Score 2** (mild debris): Soft debris was still present between the teeth after washing under tap water, and/or hard debris or stains were present around gingival margins and lingual to the mandibular central incisors or Buccal to the maxillary molars.
- **Score 3** (severe debris): Soft debris was packed not only between the teeth but also over the tissue surface of the denture, and/or hard debris and stains covered the teeth, flanges, tissue surface, and palate.

All the responses were recorded and the data was submitted to IBM SPSS Statistics for Windows, version 25.0. Armonk NY: IBM Corp.

Result

The results revealed that only 3% of the subjects evaluated, suffered from denture stomatitis. This could be attributed to the discreet knowledge in the elderly denture population about association between tissue health and denture habits/hygiene.

It was seen that frequency of cleaning the denture in a day once and twice was significantly high. Brushing the denture with soap solution as found to be the most common method. [Fig.1]

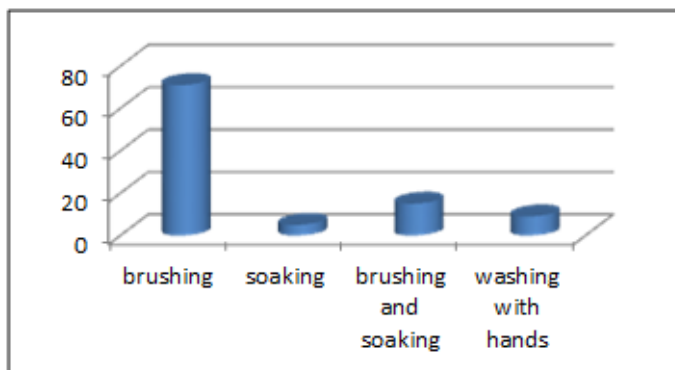


Fig.1: Preferred method of cleaning

The data also revealed that females had higher disposition for denture cleaning [Fig.2]. The results clearly show that

there was a significant co-relation ($p = 0.001$) between gender and denture cleanliness. Females maintain denture cleanliness more than males. The chi square value was 14.7.

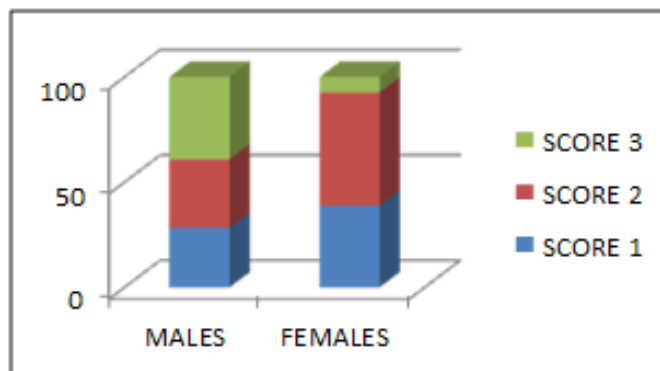


Fig. 2: Correlation between gender and denture cleanliness
The data provided information that the denture hygiene was imbibed by the dentist motivation in the patients [Fig.3]. A highly significant ‘p’ value (0.001) was found between instructions given by dentist and denture cleanliness.

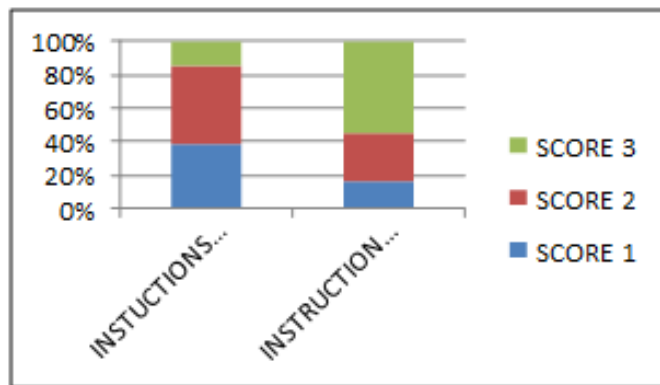


Fig. 3: Correlation between instructions provided by the dentist and denture cleanliness

The data also compared subjects with habits and denture cleanliness. A highly significant correlation was found between presence of habits and denture cleanliness [Fig.4]. The chi square value was 26.46 and p value 0.00. Subjects who had habits like smoking / pan / tobacco, had dirtier dentures than the rest.

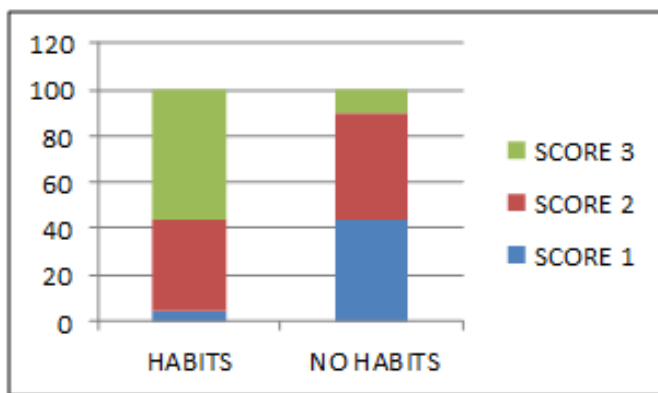


Fig.4: Correlation between habits like smoking / tobacco / pan on denture cleanliness

According to the Hoad-Reddick criteria of denture cleanliness, score 2 was highest recorded score for the dentures evaluated [Fig.5].

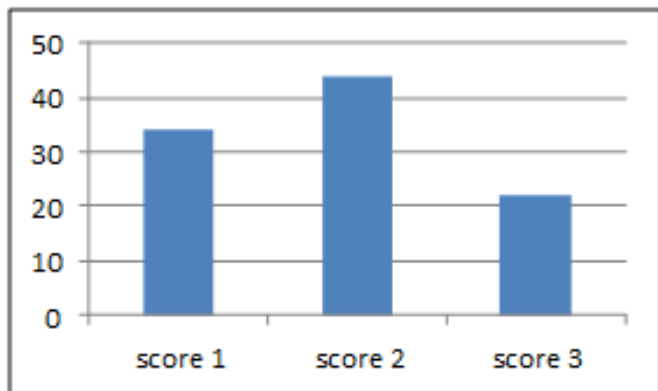


Fig. 5: Cleanliness of dentures

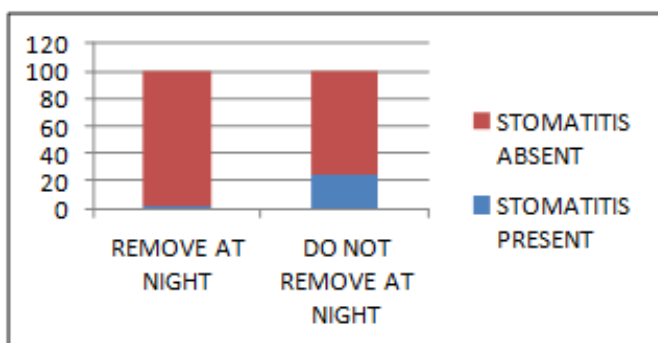


Fig. 6: Correlation between removal of dentures at night and denture stomatitis

It was also seen from the data that subjects were well motivated for denture removal at night [92%]. Thus the prevalence of denture stomatitis was found to be very low [3%].

The results clearly indicated that a highly significant correlation (0.000) exists between removal of dentures at night and denture stomatitis. Stomatitis was more common in subjects who did not remove dentures at night. Chi square value was 14.46.

Discussion

The responsibility of a dentist does not end with the denture insertion appointment. It is accomplished when the patient gets adapted to the denture along with getting adapted to the denture and tissue hygiene protocol.

In the present study, subjects above 70 years of age were evaluated to perceive the idea of understanding and execution of the denture and tissue hygiene protocol in these patients. Since the people in this age group show deteriorating neuromuscular coordination, this group was aptly selected to check for compliance.

In the present study subjects showed high awareness of denture hygiene protocols [92%] as compared to the study by Ashishtaru Saha et al³ in 2004 [47%]. This increased awareness has considerably reduced the incidence of tissue related problems that surface after denture wearing.

The present study encounters only 3% of denture stomatitis and associated tissue irritation which is considerably low when compared to the study by Jeganathan¹⁰ who found from his study that denture induced stomatitis was common to 61% of subjects in his study. Also it was observed that study by Sahul Lerra¹¹ in 2017 on Kashmiri people depicted 22.34% of denture patients suffering from burning sensation and erythematous patches under the dentures. However Byrd¹² and Gasparoto¹³ state that the problem of denture stomatitis is found in 15-70% of denture wearers which is many times dependent of patient factors like specific salivary proteins and host immunity.

The tissue reaction under the denture is largely dependent on denture plaque accumulation process and denture

removal from mouth. It is seen that calcareous deposits on impression surface of dentures are glycoprotein in nature. They have tendency to bind to the oral debris and food particles that lead to deposits on the denture¹⁴. These deposits apart from causing esthetic and malodor problem cause tissue changes like denture stomatitis, papillary hyperplasia, inflammation or chronic candidiasis. This can be prevented by educating and motivating the patient for denture hygiene by any of mechanical or chemical methods.

The present study also highlighted the highly motivated trends in the elderly people. It was seen that subjects are well informed to clean their dentures thoroughly using either mechanical or chemical aids. The most common method was found to be brushing the denture with soap solution which was used by 42% of the subjects followed by brushing with toothpaste used by 41% subjects.

Mechanical methods are found to be more common over chemical ones. This could be attributed to the fact that it is easy to adopt a method of denture hygiene which they have been using for their lives for oral hygiene¹⁵.

Here it is imperative on the part of dentist to inform and guide the patient on best method of denture cleansing along with the protocol to use it as given by DHCP recommendations¹⁶

As observed in other studies too, ^{17,11} it was seen that females were more cautious of maintaining denture hygiene.

Also it is established fact that oral habits are directly proportional to the denture cleanliness. In this study also the correlation was found to be significant [p=0.00]. These patients are very prone for denture hygiene problems.

Although, there is no experimental evidence that brushing with a toothpaste or polishing paste is more efficient than using soap or any chemical agent. However, efficient chemical denture cleansers can prove beneficial

alternatives to mechanical cleansing, especially among geriatric or handicapped denture wearers and denture wearers with oral habits⁵.

This can be mentioned because it is seen that these stains are not as easy to clean as those from denture debris are. This is because the stains used in various staining solution are water soluble. The resin denture bases is hydrophilic that attracts water-soluble substances on the surface. Thus causing staining, which occurs as a result of electrostatic charges. The presence of tobacco in the pan solution and the effect of tannic acid in the tea produced such staining.¹⁸

The pH of the staining solutions was measured, which showed paan to be more acidic with a pH of 4.06 in comparison to tea having a pH of 5.60. Thus, the increased staining property by paan can be attributed to its acidic nature, showing high affinity for acrylic resins¹⁹. It is seen from various studies that the alkaline peroxides (percarbonate/perborate), alkaline hypochlorites, the various immersion type chemical denture cleansing agents, dilute organic or inorganic acids, disinfectants, and enzymes and aid in efficient denture cleaning⁵.

Conclusion

It can be concluded that the rate of awareness amongst denture patients is increasing. This shows positive trends towards denture education and denture hygiene maintenance. Also it is highly commendable that elderly population is highly informed. Thus as dentist it is imperative that along with denture insertion, denture hygiene and tissue, under denture, maintenance should be reinforced. Also adequate instructions should be given if oral habits are detected in a patient.

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