XEROSTOMIA AND ITS EFFECTS ON THE REMOVABLE DENTURES PROPERTIES AND ORAL FUNCTIONS IN ELDERLY PATIENTS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Objective: *To determine the frequency of xerostomia in elderly patients and its effects on removable dentures retention, stability, support and its effects on the functions of removable dentures at the Department of Prosthodontics, Khyber College of Dentistry.*

Materials and Methods: *This Cross-sectional study was carried out at the Department of Prosthodontics, Khyber College of Dentistry, Peshawar from 1st January to 31st December 2018. A total of 207 subjects were recruited who fulfilled the inclusion criteria. Xerostomia and satisfaction with oral functions with removable dentures were evaluated by using shortened xerostomia inventory questionnaire .Patients satisfaction with oral functions of dentures was assessed by questionnaire and its retention, support and stability were checked clinically. The data was analysed using SPSS 2017.*

Results: *In this study the frequency of xerostomia was 18.34%.The frequency of xerostomia in females and males was 25.5% and 12.38% respectively. Subjects with age above 60 years were more prone to dry mouth i.e.; 39.13%. The most frequent complaint in the patients with removable dentures was soreness (18%) and movement of dentures with function (17%). There was a significant association (p=0.000) of xerostomia (18.34%) with dissatisfaction of speech (61%), mastication (87%), soreness (68.2%) and inadequate retention stability and support of removable dentures (89.47%).*

Conclusion: *This study concluded that xerostomia was more frequent in females than males, It was found that it is more frequent in the age group above 60 years. The patients with xerostomia were found to be more dissatisfied with the functions of the removable dentures like speech, mastication, comfort and retention of the prosthesis.*

Keywords: *xerostomia, hyposalivation, diabetes, hypertension, removable partial dentures, complete dentures, denture adhesives.*

INTRODUCTION

Saliva has an important role in maintaining the health of the oral cavity and its contiguous gastro-intestinal epithelium. Its role as lubricant protect the soft tissues from desiccation, ulceration and facilitates swallowing and speech and helps in adhesion and cohesion type of retention of removable dentures.[1] It is the ionic stimulator for taste, initiator for digestion and also used as a diagnostics specimen.[2] It has immunological role and prevents the candidal infections in the patient wearing removable dentures.[3] It protects the teeth against dental caries, erosion, abrasion and attrition.[4]

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Xerosotmia is defined as subjective perception of dry mouth. Complete lack of saliva or decrease flow of saliva is called hyposalivation. It occurs when rate of salivary flow is less than evaporation and absorption through oral mucosa. Xerostomia and hyposalivation will cause high caries index and calculus, difficulty in chewing, speaking, soreness and poor retention of removable dentures which has social and emotional implications and reduce the quality of life. Dry mouth may also be associated with depression, anxiety and stress.[5-8]

Al Dawiri and Lynch reported 29.9% prevalence of xerostomia with 72.8% reported dissatisfaction with chewing, 77.9% reporting problems with speech and 81% were dissatisfied with their ability to taste the food . In another study conducted in Japan, the prevalence of xerostomia and hyposalivation among community dwelling older individuals was 34.8 %. In Germany prevalence of xerostomia was 16%, difficulty in chewing was 90.9% of xerostomic patients, difficulty in speech was 36.4 % and soreness with removable denture was 45.5 %. Difficulty in chewing was the common complaint in elderly patients.[9-11]

The objective of this study was to find out the frequency of xerostomia and its effects on the removable denture retention, stability, support, speech, mastication and taste. There was only one local study that has reported the frequency of xerostomia in completely edentulous subjects and its association with complete denture stability.[12] This study will help in identifying the xerostomia and its management with regard to the provision of satisfactory removable prosthesis treatment.

MATERIALS AND METHODS

This Cross-sectional study was carried out at the Department of Prosthodontics, Khyber College of Dentistry Peshawar over a period of 12 months. After getting approval from institutional review board and written consent, data was collected from 207 subjects who fulfilled the inclusion criteria. Subjects of both genders with age above 50 years wearing removable dentures for atleast 6 months and without any medical co morbidities were selected. Subjects who were uncooperative, had dentures with fabrication faults and fixed partial dentures were excluded.

Shortened xerostomia inventory questionnaire was used 13. The five questions of the inventory scale was assessed by three point Likert scale as given in the table 1.Score of ≥ 10 was labelled as xerostomia. The denture functions were assessed by asking questions about difficulty in chewing of dry foods, speech and taste disturbance. Each question was assessed by 3 points Likert scale. The response fairly satisfied and dissatisfied were calculated as a single entity for a xerostomic patient. The denture retention, stability and support were checked by asking the questions about satisfaction with dentures functions and soreness. The response was assessed by two point Likert scale as given in the Table 1. The quality of retention, stability and support of the maxillary and mandibular denture were assessed clinically by prosthodontic consultants and final year residents. The dentures were assessed to exclude any manufacturing faults.

The data was analysed by using SPSS version 17.Frequencies and percentages were calculated for qualitative variables i.e; gender, xerostomia, removable dentures and the response of the patient. Mean ± SD was calculated for age. The Post stratification was performed for the effect modifications of age, gender and type of removable dentures. Chi-square test was applied to calculate the association between response of the patient with removable dentures and xerostomia keeping the $P < 0.05$ to be significant.

RESULTS

Out of 207 subjects, 113 (54.6%) were males and 94 (45.4%) were females and the mean age was 61.7 ± 6.05 years .The frequency of xerostomia was 18.34 % shown in table 2.

The distribution of gender with xerostomia showed that 25.5% females and 12.38% were male. The distribution of age with xerostomia showed that 39.13 % xerosotmic subjects were above 60 years. The distribution of dentures with xerostomia showed that 26.27% subjects were wearing complete dentures as shown in the table 2.

Satisfaction of subjects with the function of dentures was also determined .The most frequent complaint with removable dentures was soreness 18%, movement of denture with function 17%, and dissatisfaction with chewing and speech was 10% while 7% respectively as shown in table 3.

Chi-square test was applied to determine the

Table 1: Assesment of xerostomia by shortened xerostomia questionnaire and oral functions with dentures

Questions	Response
1. My mouth feels dry when eating	Never=1
2. I have difficulty in eating dry food?	frequent= 2
3. I have difficulty swallowing dry foods?	Always = 3
4. My lips feel dry?	Score > 10 xerostomia
5. My mouth feels dry?	
Oral function with dentures	
6. Speech	Satisfied =1
8. Chewing	Fairly satisfied = 2
9. Taste	Dissatisfied= 3
10. Soreness	Yes
11. Movement of denture with oral function	No

Table 2: Distribution of xerostomia with gender, age group and type of dentures

Variables		Xerostomia	Non xerostomia	Total
Gender	Male	14 (12.38%)	99 (87.61%)	113
	Female	24 (25.5%)	70 (74.46%)	94
	Total	38 (18.35%)	169 (81.64%)	207
Age groups	50-55	5 (11.11%)	39 (88.9%)	45
	56-60	9 (21.4%)	33 (78.6%)	42
	61-65	9 (20.4%)	35 (79.5%)	44
	66-70	15 (19.73%)	61 (80.3%)	76
	Total	38 (18.35%)	169 (81.64	207
Type of denture	CD	31 (26.27%)	87 (73.73 %)	118
	RPD	7 (7.8%)	82 (92.13%)	89
	Total	38	169	207

Table 4: Association of xerostomia with denture functions

Denture function		Non-Xerostomic 169 (81.6%)	Xerostomia 38 (18.4%)	P value
Chewing	Dissatisfied	1 (0.59%)	20 (52.6%)	0.001
	Fairly satisfied	4 (2.3%)	13 (34.2%)	
	Satisfied	16 (49.7%)	7 (18.4%)	
Speech	Satisfied	162 (96%)	4 (10.5%)	0.001
	Fairly satisfied	74 (14%)	19 (50%)	
	Dissatisfied	0	15 (39%)	
Taste	Dissatisfied	0	0	0.628
	Fairly satisfied	3 (0.02%)	1 (0.02%)	
	Satisfied	166 (98.22%)	37 (97.37%)	
Soreness with dentures	Yes	11 (0.06%)	26 (68.42%)	0.001
	No	158 (93.4%)	12 (31.6%)	
Movement of dentures with functions	Yes	3 (0.02%)	33 (89.47%)	0.001
	No	167 (98.22%)	4 (0.1%)	

relationship between xerostomia and satisfaction of patients with removable dentures functions and discomfort. There was a significant association (p=0.00) between xerostomia (18.34%) and dissatisfaction with chewing (87%), speech (61%), soreness (68%) and movement of denture during function (89%) except for the taste (1%) which was p=0.628. (Table 3).

DISCUSSION

The frequency of xerostomia in the subjects reporting to the Prosthodontics department of Khyber College of Dentistry was 18.4%. This shows relative high frequency of xerostomia in the subjects wearing removable prosthesis which could be attributed to the methodology and the small sample size. In Islamabad and Lahore 32.5% prevalence of xerostomia was reported.[12] The Niklander et al reported 10.8 % prevalence of xerostomia in Brazil.[15]

Xerostomia was more frequent in females (63%) and in the age group above 60 years .The results of this cross-sectional study were consistent with the studies conducted in Islamabad and Lahore, Brazilian population and in New Zealand where xerostomia was more common in females and in the subjects above 60 years.[12,15,16] This trend might be due to the menopausal age of females, having low thresh hold for pain and decreased salivary production with age. Elderly population is more susceptible for contracting systemic diseases such as hypertension, diabetes mellitus, asthma, malignancy, anti-psychotics, anti-hypertensive, anti-cholinergic medications, anti-asthmatics, corticosteroids, chemotherapeutic drugs and radiations have an important role in the development of xerostomia.[5,8]

Among the subjects who complained of soreness with their dentures, 68.42% were those who had xerostomia. Dry mouth was significantly associated with problems in speech, mastication and discomfort with removable dentures i.e.; soreness and movement of denture during function (p=0.000). Similar results were reported by study conducted in Rawalpindi, Jordan and Turkey.[10,12,16] Saliva is an important factor in providing the smooth and comfortable oral and removable prosthesis functions. It gives the cohesion and adhesion means of retention to the dentures by providing the thin layer of fluid between the fitting surface of the denture and mucosa of the residual ridge. Lack of retention in the denture results in dissatisfaction with mastication, speech and denture stomatitis and social embarrassment.[17]

As the results of this study showed that patients with xerostomia were not satisfied with their removable dentures. The management of these patients require thorough medical history and dental examination, palliative care and improving the quality of removable dentures. Salivary substitutes, sipping of water whole day, avoiding carbohydrates and frequent wetting of denture and denture adhesives should be advised .The discomfort with removable dentures can be reduced by improving the retention, stability and support of the dentures .It is necessary to record the denture bearing area with impression materials which are biocompatible with dry mucosa. Impression materials like zinc oxide eugenol and impression plaster which adds discomfort to the xerostomic patient should be avoided. Xerostomic patients are prone to the cervical caries and plaque accumulation, fluoride dentifrices and non-alcohol based mouth rinses should be prescribed.[3,17,18]

This study didn't evaluate the hypo salivation which is the actual decrease in the salivary flow rate. However, the subjective perception of the dry mouth can easily be diagnosed by using shortened xerostomia inventory questionnaire. There is need to conduct a national survey on the prevalence of xerostomia and hyposalivation in all the age groups and its effect on the quality of life in Pakistan. By identifying the individuals with the perception of dry mouth special measures should be taken to improve their oral hygiene and prosthodontics treatment planning.

CONCLUSIONS

Within the limitation of this study the frequency of xerostomia was 18.38 % and was more common in female and elderly population. The dissatisfaction with dentures was more frequent in xerostomic patients and there was significant association between xerostomia and discomfort with denture functions (p=0.000).Xerostomia should be evaluated during preliminary history and examination which will not only help in the most comfortable denture fabrication but will also improve quality of life.

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