

XEROSTOMIA AND ITS EFFECT ON COMPLETE DENTURE STABILITY

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ABSTRACT

Xerostomia is defined as dryness of the mouth due to the lack of normal secretion of saliva. It is a common clinical condition that could be the result of systemic conditions such as rheumatic arthritis, Sjogren's syndrome, salivary gland diseases, diabetes mellitus. Xerostomia is more prevalent in the elderly people, primarily due to increased use of drugs because of their susceptibility to disease. In complete denture wearers, the wetting mechanics of saliva are necessary to assist the retention of prostheses. The aim of the present study was to assess the frequency of xerostomia and denture instability in edentulous patients wearing complete dentures and to establish the association of xerostomia with denture stability in the local population. It was a questionnaire - based cross-sectional study conducted from Dec 2015 to September 2016. It targeted four major dental institutes, two in Rawalpindi / Islamabad and two in Lahore. A total of 285 questionnaires were distributed. Data were analyzed using SPSS version 21. Out of 246 subjects, xerostomia was found in 80 (32.5%) patients and non xerostomic were 166 (67.47%) while denture stability was found in 177 (71.95%) and instability in 69 (28.05%) patients. Of the 80 xerostomic subjects, 63 (78.75%) had unstable dentures. Association of xerostomia with denture stability was calculated using Chi-Square test and was found statistically significant ($P < 0.001$). Dry mouth appears to have a significant impact on the oral function in denture wearers. Xerostomia should be diagnosed and effectively managed before any complete denture therapy is initiated.

Key Words: Complete Denture, Denture Stability, Dry Mouth, Saliva, Xerostomia.

INTRODUCTION

Saliva is a body fluid, secreted by three pairs of major salivary glands (parotid, submandibular and sublingual) and by many of minor salivary glands.¹ Saliva plays a key role in maintaining oral health and function.² The lubricant function protects the soft tissues from desiccation, penetration or ulceration. It also facilitates the swallowing of food¹ and acts as an immunological barrier by stimulating soft-tissue repair by reducing clotting time and accelerating wound contraction. Saliva is important as a digestive initiator

and an ionic stimulator for taste.³ Saliva functions to cleanse and moisten the oral cavity. It regulates water balance, and has antimicrobial and buffering actions.⁴

Xerostomia is defined as dryness of the mouth due to the lack of normal secretion of saliva. Xerostomia is a common clinical condition that could be a result of systemic conditions such as rheumatic arthritis, Sjogren's syndrome, salivary gland diseases, diabetes mellitus.⁴ Decreased salivary flow rate has been reported as a consequence of treatment with various types of drugs.⁵ Patients suffering from xerostomia exhibit not only dry mouth but also difficulty in speaking and swallowing and increased susceptibility to dental caries and oral infections.⁴ Xerostomia is more prevalent in the elderly population, primarily due to increased use of drugs because of their susceptibility to disease.

In complete denture wearers, the wetting mechanics of saliva are necessary to assist the retention of prostheses.³ It has been reported that complete denture patients with Xerostomia have more intense sore spots than patients with normal salivary flow.

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The oral mucosa becomes dry and tends to crack and ulcerate, which makes wearing removable prostheses uncomfortable. Problems associated with removable dental prostheses include frequent ulcerations, poor retention, difficulty in speaking and swallowing, and frequent infections. However, other studies have shown that low salivary flow rates were not closely related to reduced masticatory performance or retention and stability in elderly complete denture wearers.

Different studies have documented different incidence rates of xerostomia among males and females all over the world^{6,7} and they have also established the association of xerostomia with removable prosthesis that tends to have a negative effect on quality of life.³ The aim of this study is to assess the frequency of xerostomia and denture instability in edentulous patients wearing complete dentures and to establish the association of xerostomia with denture stability in the local population.

METHODOLOGY

A cross-sectional study was conducted from December 2015 to September 2016. It targeted four major dental institutes, 02 in Rawalpindi/Islamabad (Armed Forces Institute of Dentistry and Islamic International Dental College) and two in Lahore (Lahore Medical and Dental College and University College of Medicine and Dentistry, Lahore). A questionnaire from a previous study³ was used for data collection. About 246 patients from both genders, aged between 40-70 years and wearing complete denture for at least one month were selected. Dentate patients with implant-supported dentures were excluded from the study. A positive response to at least one of the five following questions about symptoms was considered in this study to be diagnostic of xerostomia: "Does your mouth usually feel dry all the 24 hours?" "Does your mouth feel dry during eating?" "Do you feel difficulty during swallowing food?" "Do you take frequent sips of water?" "Does the saliva in your mouth seem too less?"^{3,7,8} Denture stability was assessed by asking following questions – "Does your denture move while eating food?" "Does your denture move during speech?" "Does your denture cause discomfort or pain during function?" Patients and dentures were examined by two consultant prosthodontics to rule out any anatomical deficiencies or manufacturing faults that may lead to instability. Occlusion was also verified to identify any premature or deflecting contacts. Data were analyzed using SPSS version 21. Quantitative data like age were presented as mean $\pm$ SD. Qualitative variables like gender, xerostomia and stability were reported in terms of frequencies and percentages. Post stratification Chi Square-test was used for effect modifiers like age and gender. P value <0.05 was taken as significant.

RESULTS

Out of 246 cases, 27 (10.97%) were aged less than 40 years and rest 219 (89.02%) were more than 40 years old. Mean age was 61.1048 ± 5.46 years. There were 108 males (43.9%) and 138 females (56.1%). Xerostomic patients were 80 (32.5%) and non xerostomic were 166 (67.47%) while denture stability was found in 177 (71.95%) and instability in 69 (28.05%) patients (Fig 1). Of the 80 patients with xerostomia, 63 (78.75%) had unstable dentures. Association of xerostomia with denture stability was found to be statistically significant ($P = <0.001$) (Table 1). However, association of denture stability and xerostomia with gender was not found significant ($P = 0.94, 0.965$) (Tables 2-3).

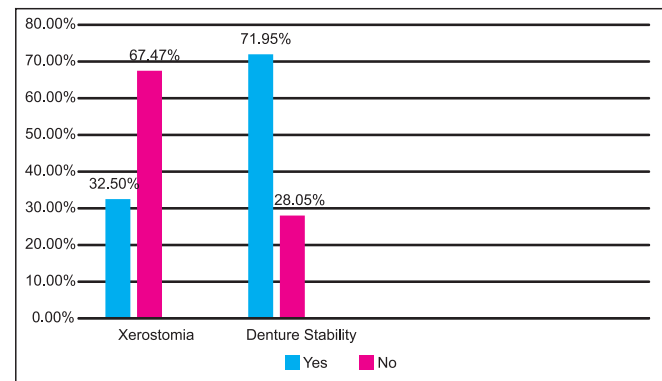


Fig 1: Xerostomia and denture stability in study subjects

TABLE 1: STRATIFICATION OF XEROSTOMIA WITH RESPECT TO DENTURE STABILITY

Xerostomia	Stability		P-value
	Unstable	Stable	
Present	63	17	<0.001
Not Present	06	160	
Total	69	177	

TABLE 2: STRATIFICATION OF STABILITY WITH RESPECT TO GENDER

Gender	Denture stability		P-value
	Unstable	Stable	
Male	27	81	0.94
Female	42	96	
Total	69	177	

TABLE 3: STRATIFICATION OF XEROSTOMIA WITH RESPECT TO GENDER

Gender	Xerostomia		P-value
	Present	Not present	
Male	35	73	0.965
Female	45	93	
Total	80	166	

DISCUSSION

Edentulism and xerostomia are considered prominent problems in older adults that have a considerable impact on their quality of life. In the present study, 32.5% of patients wearing complete dentures presented with signs and symptoms of xerostomia. These findings are comparable to the results of Al-Dwairi and Lynch³ who report a subjective feeling of dry mouth in 30% of their study subjects. In contrast, Abdullah MJ⁷ reported only a 16% prevalence of xerostomia in his study population. Such variations in the prevalence of xerostomia are common in literature and may be attributed to the age of study subjects, gender, sample size and methodology.

In the present study, significantly more females reported dry mouth as compared to men. Similar results were reported by Al-Dwairi³, Abdullah MJ⁷, Bosinceanu et al⁹ and Johansson et al.¹⁰ This might be related to the menopausal age of the women and the fact that women tend to report higher pain intensity in general and are more expressive about their general illness condition.^{11,12} Additionally, dry mouth may be affected by psychological status, such as anxiety and depression^{2,13} as the prevalence of psychological symptoms or diseases was reported to be higher in women than in men.^{14,15} In contrast, Rad et al⁶ reported a higher prevalence of xerostomia in men than in women. This may be attributed to a higher number of males in the study sample.

The results of the present study showed that out of 80 patients with subjective dry mouth, 63 (78.75%) patients complained of unstable dentures. This finding is endorsed by the results of Bosinceanu et al⁹ who reported that 78% of patients with subjective dry mouth complained of unstable dentures while Al-Dwairi and Lynch³ showed that 76% of patients with dry mouth symptoms complained of prosthetic instability. It is worthy to note that clinical findings of denture instability and feeling soreness among non-xerostomic participants were mainly related to fabrication faults. On the other hand, clinical examination of complete dentures of the xerostomic participants did not reveal any major faults that might lead to denture instability or associated with soreness. Lack of denture stability and retention can cause social embarrassment if prosthesis dislodges during common functions; they ultimately could impair a person's ability or willingness to speak or eat, particularly in public.

This study did not include 'salivary flow rates' as part of the clinical examination as it evaluated the impact of xerostomia and not hyposalivation, although the clinical signs used during the examination are signs associated with a lack of saliva in each participant's mouth, rather than purely a perception of dry mouth.

The results of the present investigation revealed a significant impact of subjective dry mouth on oral functions in complete denture wearers. This study showed that xerostomia is significantly associated with denture instability ($P < 0.001$). Similar results were found by Al-Dwairi and Lynch.³ However, to generalize results of the present study to the entire population, studies with a larger sample size and a diverse sample must be conducted. The association of xerostomia with gender was not found to be statistically significant ($P = 0.96$; 0.87). Similarly, the association of denture stability with gender was also not significant statistically ($P = 0.77$; 0.94).

Xerostomia is a debilitating condition and is even more painful for a patient wearing complete dentures. Early diagnosis with a thorough assessment of the underlying medical problems and medications as well as an assessment of the denture and the denture-bearing mucosal surfaces is mandatory. A number of treatments are available for dry mouth, although remedies usually are palliative¹⁶ and none are described specifically for the denture-wearing population. Patients should be instructed to increase their water intake and take frequent sips of water or use artificial saliva or salivary substitutes as an alternative. Close attention should be given to clinical and laboratory procedures aimed at optimizing denture retention and stability, and patients should be reviewed at regular intervals to help prevent problems associated with denture wear. Patients should be advised to wet their prostheses before wearing, and consider using denture adhesives to aid with denture retention and stability.

CONCLUSION

Within the limitations of this study, the following conclusions can be drawn:

- 1 Relative frequency of xerostomia in patients wearing complete dentures was 32.5% ($n = 80$).
- 2 Complete denture patients with xerostomia reported a high frequency (78.75%) of denture instability.
- 3 Effect of xerostomia with denture stability was found to be statistically significant ($P = <0.001$).
- 4 Dry mouth appears to have a significant impact on the oral function in denture wearers. It should be diagnosed and effectively managed before providing a patient with complete dentures so that problems such as denture instability are not encountered.

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