Comparative Evaluation of Xerostomia among Diabetic and Nondiabetic Subjects Wearing Complete Denture

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**Background:** Diabetes mellitus represents a group of metabolic diseases that are characterised by hyperglycaemia due to a total or relative lack of insulin secretion and insulin resistance or both. Diabetes mellitus patients present with a higher susceptibility to infections due to a deficiency in polymorphonuclear leukocytes, as a result of vascular alterations and neuropathies. An increased risk of infections has been observed in complete denture wearing subjects with xerostomia. The objective of this study was to compare diabetic and non-diabetic subjects wearing complete dentures regarding xerostomia of different age group.

**Materials and Methods:** A cross-sectional study was conducted among 50 subjects, 25 with and 25 without a diagnosis of diabetes, were matched for gender, race, and age.

**Results:** In this study we intended to compare diabetic and non-diabetic subjects wearing complete dentures regarding xerostomia and we found that xerostomia was more associated with diabetic denture wearer group in comparison with the non-diabetic denture wearers with a significant \(P\) value of <0.05.

**Conclusion:** These results indicate that xerostomia should be diagnosed and effectively managed before any complete denture therapy is initiated in diabetic denture wearing patients to improve the quality of life.

**KEYWORDS:** Diabetes mellitus, salivary flow, stimulated saliva, xerostomia

**INTRODUCTION**

Diabetes mellitus is a chronic metabolic disorder characterized by hyperglycemia, associated with irregularities in the metabolism of carbohydrates, lipids, proteins, and susceptibility to the development of specific forms of premature renal, ocular, neurological, and cardiovascular diseases. Diabetes mellitus is one of the most prevalent diseases worldwide and is commonly found in older individual. It is one of the main reasons due to which early tooth loss occur. It was found that the direct correlation exists between diabetes mellitus and edentulism. Patients with a diagnosed diabetes mellitus present a higher susceptibility to infections due to a deficiency in polymorphonuclear leukocytes, due to peripheral vascular alterations and peripheral neuropathies, which increases the risk of infection in oral cavity and inadequate maintenance of oral hygiene and
hygiene of existing complete dentures. Special care and great attention on the part of the dentist in terms of clinical examination is necessary, as these subjects commonly report specific symptoms such as a sensation of dry mouth and burning sensation, difficulty in mastication and speech difficulties, dry lips, altered taste, and a lack of adaptation to the complete denture. Diabetes mellitus increases the susceptibility to erosion and ulceration of the mucosa where it comes in contact with the tissue surface of the complete denture.[4] Psychological factors play an important role in xerostomia. Hyposalivation is significantly associated with depression and anxiety. Wettability, surface tension, viscosity, and muscle control are factors that enhance denture retention.[4] Most of the people with diabetes are under continuous medication and psychological treatment, which affects the denture tolerance.[3] The aim of this study was to compare diabetic and nondiabetic subjects wearing complete dentures regarding xerostomia.

**Materials and Methods**

A total of 50 complete denture-wearing subjects were selected, of which 25 subjects were diagnosed with type 2 diabetes and considered as experimental group. Another 25 subjects were healthy individuals and were considered as control group. No selection was made on the basis of gender, race, and age.

**Control group**

*Inclusion criteria*
- All the selected individuals should be healthy.
- No temporo mandibular joint problem.
- No systemic diseases.
- Denture should be in proper condition.
- No hormonal disturbances.

*Exclusion criteria*
- Patient having faulty denture should not be included in the study.

**Experimental group**

*Inclusion criteria*
- Only patient with type 2 diabetes

*Exclusion criteria*
- Patient with type 2 diabetes with systemic diseases such as hypertension, cardiovascular disease, and neurological disorder
- Patient with type 1 diabetes mellitus
- Patient on medication other than medication for type 2 diabetes mellitus
- Patient with systemic disease

**Method**

A questionnaire was prepared, and the subjects were asked to complete the questionnaire after getting their consent. Data were tabulated, and statistical calculations were performed using the Statistical Package for the Social Sciences (SPSS) software, version 22.0 (SPSS, Chicago, Illinois). The normality of the distribution of each variable was assessed using the Kolmogorov–Smirnov test. Chi-square with significance level set at $P < 0.05$ was used to compare xerostomia between two groups.

**Results**

Table 1 and Graph 1 show that xerostomia was more associated with diabetic denture wearer group in comparison with the nondiabetic denture wearers with a significant $P$ value of less than 0.05.

**Discussion**

The salivary flow rate differs between the groups, and the feelings of denture instability were reported more commonly in diabetic denture wearer group. The results support the research hypothesis that xerostomia is increased in complete denture-wearing subjects with diabetes compared to that in controls. Wu and Ship[4] observed that xerostomia and salivary gland hypofunction are associated with local and systemic conditions. Advancing age, selected medical disorders, polypharmacy, smoking, and recreational drug usage have all been shown to be associated with salivary gland hypofunction and/or xerostomia.[3] The chewing-stimulated whole salivary flow rate was 0.3-0.5 mL/min. Navazesh et al.[3] observed that parotid glands contribute mostly to stimulated saliva, whereas submandibular glands predominantly affect the unstimulated whole saliva flow rates. Salivary gland hypofunction can lead to dental caries, dental erosion, tooth demineralization, oral candidiasis, and altered oral sensation. Xerostomia and hyposalivation may alter a patient’s oral health and quality of life. To anticipate this problem, a good recommendation is drinking regularly and eating highly fluid-containing food.[3] Hyposalivation induced by medication may be treated by altering the dosage of the medication or by replacing it with an equally effective other medication.[4] Also gustatory and mechanical salivary stimulating techniques may be helpful to relieve the feelings of xerostomia, such as consuming sugar-free chewing gum, candies, and mints, as well as acidic drinks and foods.[5,6] Systemic medication of pilocarpine or cevimeline or application of physostigmine to the oral mucosal surface may improve saliva secretion, but the possible side effects should be determined, and
if possible, anticipated or controlled. Sreebny and Schwartz reported that the use of medications may alter the salivary gland secretion, with the most influential drugs being antidepressant, antihypertensive, and diuretic agents. When stimulating salivary secretion is not possible or not adequate, symptomatic relief of the oral complaints becomes the primary management strategy. Saliva substitutes, lubricating oral gel, and intraoral reservoirs of saliva substitutes may be used. Frequent oral evaluations and oral hygiene instructions...
are essential to prevent caries and other oral infections in hyposalivation-related medications using the (institutionalized) elderly people. Daily antimicrobial mouth rinses may help in preventing inflammation.[11]

**CONCLUSION**

Within the limitations of this study, significant differences were observed in xerostomia when comparing denture-wearing patients who were diabetic and nondiabetic. Dry mouth appears to have a significant impact on the oral function in diabetic denture wearers. Xerostomia should be diagnosed and effectively managed before any complete denture therapy is initiated in denture-wearing patients who were diabetic to improve the quality of life.

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**Conflicts of interest**

There are no conflicts of interest.

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