

Comparative Study Of Xerostomia In Diabetic And Hypertensive Patients Wearing Complete Denture

Maitri Mistry

Abstract

Background.

Xerostomia, commonly known as dry mouth, is a condition characterized by a reduction in saliva production. Saliva plays a crucial role in maintaining oral health by aiding in digestion, speech, and protecting the oral mucosa. When saliva production is compromised, individuals may experience discomfort, difficulty in chewing and swallowing, an increased risk of dental caries, and oral infections. Diabetes mellitus and hypertension are two prevalent chronic conditions worldwide, each with its own set of complications. Both diseases have been associated with xerostomia, which can further exacerbate oral health problems. Particularly in individuals wearing complete dentures. Through comprehensive assessment and comparative analysis, researchers seek to elucidate whether there are distinct patterns of xerostomia manifestation in diabetic and hypertensive patients wearing complete dentures. Thus, this study aims to compare the condition of xerostomia in diabetic and hypertensive patients wearing complete dentures.

Materials and method

A total of 60 patients were selected using a cross-sectional study. Out of which 30 patients were diabetic and 30 were hypertensive. Perception of xerostomia was evaluated using a questionnaire in the form of Google Forms. The responses were recorded and analyzed accordingly.

Results

On analysis, the results were inclined towards diabetes. Indicating that diabetic patients experienced significantly less retention in their dentures compared to the hypertensive patients. Diabetic patients encountered burning tongue sensation remarkably more than hypertensive patients with a significant p-value of 0.05.

Conclusion

In order to improve the life quality of diabetic and hypertensive patients, it's crucial to diagnose xerostomia beforehand. Since diabetic patients show significantly less retention in complete dentures, the treatment plan should be drafted carefully and accordingly. The medical history and symptoms should be taken into consideration to prevent further discomfort for the patient.

Date of Submission: 08-04-2025

Date of Acceptance: 18-04-2025

I. Introduction

Diabetes mellitus is associated with the phenotype of hyperglycemia that is shared by metabolic disorders. Non-insulin-dependent diabetes is diagnosed, by the absence of features of insulin-dependent diabetes. It is distinguished in people of age above 40 years. 85-90% of diabetes is linked to non-insulin-dependent diabetes. It's a combination of beta cell failure and insulin resistance (Harrison¹). Diabetes has oral manifestations associated with the dysfunction of cells. Most common oral manifestations of diabetes include xerostomia, decay, burning mouth syndrome, altered taste, etc.⁽²⁾

Around 20% of the world's population, is diagnosed as hypertensive which is predicted to rise even more. Factors that play a role in causing hypertension include predisposing genetic factors, lifestyle and neuro or vascular disturbances ⁽³⁾. Beta-blockers, calcium channel blockers and ACE inhibitors are regarded as first-line drugs for hypertension. Patients on prolonged medication are diagnosed with hyposalivation and dry mouth along with facial nerve paralysis, gingival bleeding and overgrowth ⁽⁴⁾.

The aim of this study is to compare the effect of xerostomia on complete denture since it's altered greatly due to diabetes and medications for hypertension and it compromises the lifestyle and general health of the patients.

II. Materials And Method:

A total of 60 patients wearing complete dentures out of which, 30 diabetic and 30 hypertensive patients consisting of 23 females and 37 males, were examined in the department of prosthodontics at Karnavati School of Dentistry, Bharat.

Inclusion criteria:

- Individuals with age 55 or above.
- Type 2 diabetes mellitus
- Hypertensive patients with ongoing beta blockers, calcium channel blockers and ACE inhibitors medications.

Exclusion criteria:

- Patients with diabetes type 1
- Hypertensive patients who are not on any kind of medication.
- Patients aged less than 55

A questionnaire was prepared and verified by dental professionals and experts. Each individual after taking their consent were asked to fill out the questionnaire. Google Forms was used as an aid in forming a questionnaire and the data was compiled in an Excel sheet for further statistical analysis. The data was collected manually after a thorough patient examination and the responses were recorded.

The following is the link of the google form used:

https://docs.google.com/forms/d/e/1FAIpQLSfV5WEpJ7b2iElOsPylxpSvA0fsd5ooqE6JEJHeI5BArxL9wg/vie wform?usp=sf_link

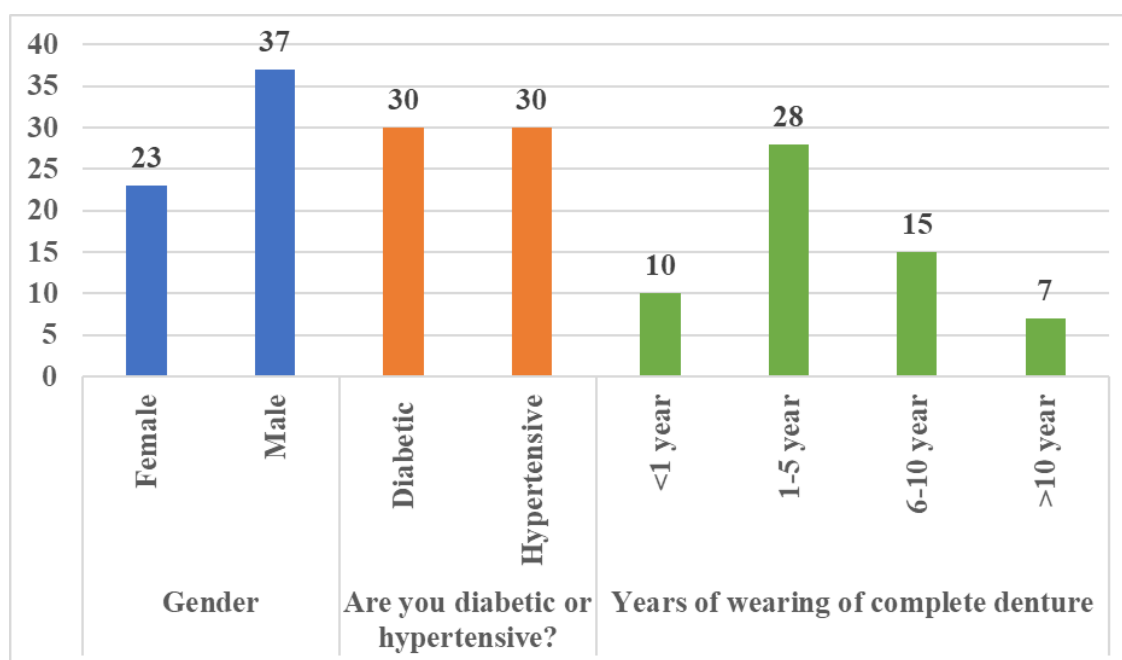
III. Results:

The statistical analysis of the recorded data for table 2 and graph 2 was done using SPSS 26.0 for data analysis and chi-square test used to test association with p value equal to or less than 0.05 , whereas no statistical test were used for table 1 and graph 1

Table 1 and Graph 1 show the demographic and clinical features of the participants and Table 2 Graph 2 shows the distribution of xerostomia in diabetic and hypertensive patients in denture wearers.

Table 1:

Demographic and clinical features	Response	No (n=60)
Gender	Female	23
	Male	37
Are you diabetic or hypertensive?	Diabetic	30
	Hypertensive	30
Years of wearing complete dentures	<1 year	10
	1-5 year	28
	6-10 year	15
	>10 year	7

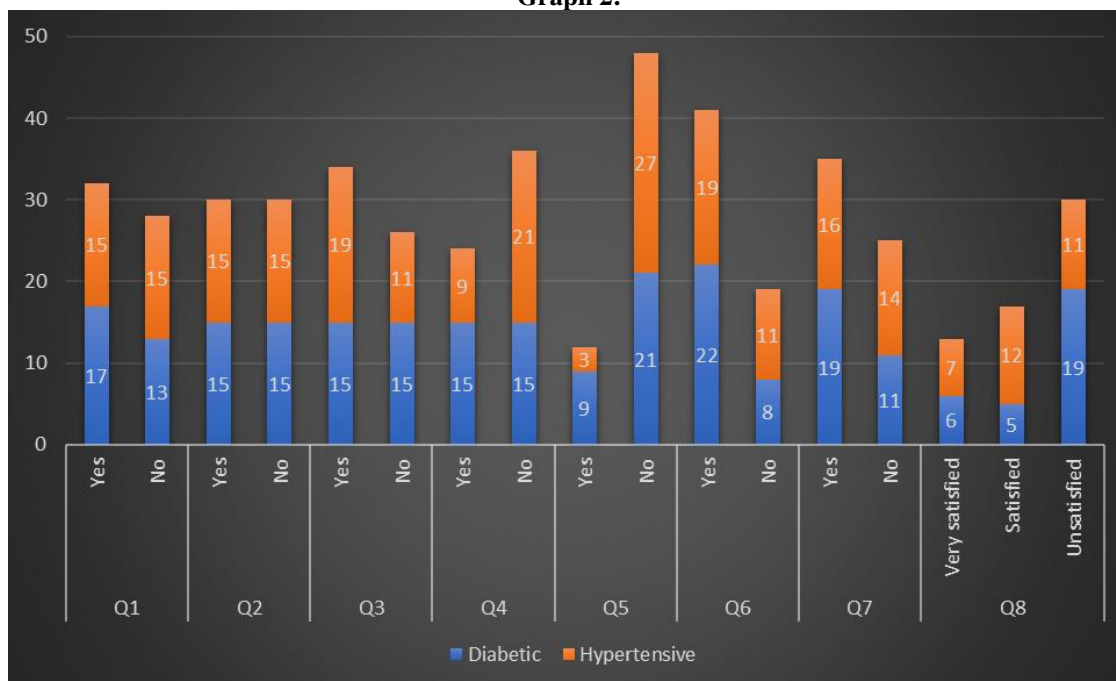


Graph1: A total of 60 patients, with equal number of diabetic and hypertensive patients were selected including 23 female and 37 male were examined. Maximum patients were using complete denture for 1-5 years.

Table 2

No.	Question	Response	Diabetic (n=30)	Hypertensive (n=30)	Chi-Square	P value
Q1	Do you have taste problems?	Yes	17	15	0.268	0.605
		No	13	15		
Q2	Do you find difficulty in swallowing?	Yes	15	15	0.000	1.000
		No	15	15		
Q3	Does your mouth feel dry during day?	Yes	15	19	1.086	0.297
		No	15	11		
Q4	Do you need to consume liquids while eating?	Yes	15	9	2.500	0.114
		No	15	21		
Q5	Does your tongue burn?	Yes	9	3	3.752	0.053
		No	21	27		
Q6	Do you have problems of ulcer, redness or any other which may create a problem for using a complete denture?	Yes	22	19	0.693	0.405
		No	8	11		
Q7	Are there any foods you cannot eat?	Yes	19	16	0.617	0.432
		No	11	14		
Q8	Are you satisfied with retention in your denture?	Very satisfied	6	7	5.093	0.078
		Satisfied	5	12		
		Unsatisfied	19	11		

Graph 2:



8 main questions focusing on xerostomia and its relation with retention , were fabricated to analyze the effect of xerostomia in the patients with the selected criteria. In the graph , blue represents diabetic and orange represents hypertensive patients respectively.

IV. Discussion:

Xerostomia or dryness of mouth is often observed in elderly patients due to increased medications intake and their susceptibility to diseases. Conditions like redness, ulcers , difficulty in swallowing and retention are often observed. In specific systemic diseases like diabetes and hypertension the vascular supply is compromised , leading to decreased oxygen supply to the basal cells of epithelium. Thus, the thickness of the mucosa is gradually reduced and causes sore spots and other conditions, making the removable prosthesis uncomfortable for the patients (⁵). According to our study, it was observed that more than half of the diabetic and hypertensive participants experienced ulcer and redness like conditions, making it a relatively common problem. Although there was no significant difference between diabetic and hypertensive patients, the total number of patients experienced redness and ulcer were, 41 out of 60. According to studies, hyposalivation does not alter the mastication. Any movements of jaw that take place while speaking were not affected (⁶).

Researchers conclude that dry mouth has adverse effect on the oral health , general health and life of the patients and it affects the functions and satisfaction of the denture⁽⁷⁾.

Our aim in this study was to compare xerostomia in diabetic and hypertensive patients wearing complete denture. Xerostomia shows variety of symptoms and it can be best evaluated by asking about the condition to the patients. In this cross sectional study, the data was collected using a questionnaire and the interpretation of results indicated that out of 30 diabetic patients, 19 were unsatisfied with the retention in their denture while comparing it with hypertensive patients, where 11 out of 30 patients were unsatisfied with the retention. Showing a distinct p value of 0.07 while 9 out of 30 diabetic patients complaint of burning tongue sensation. Which accounts, as almost 1 in every 3 diabetic patients. It was noticed that the diabetic patients felt the need , to consume more liquid while consuming food and they faced problem of not being able to consume selective food due to dry mouth. Although there was no significant difference in diabetic and hypertensive patients, diabetic patients were found to have more dryness in their oral cavity. Equal number of diabetic and hypertensive patients faced difficulty in swallowing. Various researches suggest that xerostomia leads to dysphagia and it being the primary effect of xerostomia, causes difficulty in day to day life of the patients and mastication comes as the secondary concern in such scenarios ⁽⁸⁾.

The results support the research hypothesis by showing predilection towards diabetes. Indicating that xerostomia is more predominant in diabetes than hypertension. Complete denture users might be required to use artificial salivary substitute or use agents that help stimulate residual gland function. In order to keep the mouth moist, use of mouthwashes that contain xylitol, sorbitol, etc. are prescribed for reversing hyposalivation to an extent. Its important to consider that the treatment option opted for the patient is palliative. Its also vital to consider the medical history during the treatment and special care to be taken, so as to obtain best retention and stability in the removable prostheses. Dental adhesives have been the most common and comfortable option used in our department. Since wettability, adhesion and cohesion are important factors of consideration in retention , adhesives appear to be favorable. Patients wearing complete denture who are diagnosed with hyposalivation, often complain of difficulty in normal oral functions with the chief complaint of lack of retention⁽⁹⁾.

This study included the impact of xerostomia and not salivary flow rate as a part of evaluation. Although, they are interrelated and clinically signs of hyposalivation are present. The results of this study were subjective. Where it affected the complete denture users in retention. In hypertensive patients, only those with ongoing medications were included. Although, the respondents showed difficulty in remembering the names of the medications.

In conclusion, it was interpreted that the clinician who is able to identify hyposalivation and plan treatment accordingly, can manage to achieve satisfactory results. Since ignorance to the medical history of the patient and associated symptoms of the disease, tend to have adverse effect on their life. Considering that retention, stability and support are the basic factors which contribute to an acceptable denture for the patient. Overall, the results suggests that saliva plays a critical role and alteration in it affects the removable dental prosthesis and thus affects the basic oral function of the patients.

References:

- [1] Kasper, Dennis L., Et Al. Harrison's Manual Of Medicine: 16th Edition. Mcgraw Hill Professional, 2005
- [2] Rohani B. Oral Manifestations In Patients With Diabetes Mellitus. World J Diabetes. 2019 Sep 15;10(9):485-489.
- [3] Warrell, David A., Et Al. Oxford Textbook Of Medicine. Oxford UP, USA, 2010.
- [4] Langari SF, Hosseini SR, Bijani A, Jenabian N, Motalebnejad M, Mahmoodi E, Madani ZS, Sayadi F, Naghibi Sistani M, Ghadimi R, Baladi F, Hajimirzamohammad M, Mehryari M, Shirzad A. Association Between Antihypertensive Drugs And The Elderly's Oral Health- Related Quality Of Life: Results Of Amirkola Cohort Study. Caspian J Intern Med. 2022 Summer;13(3):582-588.
- [5] Misch, Carl. Contemporary Implant Dentistry.
- [6] Gomes, S. G. F., Cury, A. A. D. B., & Garcia, R. C. M. R.. (2011). Effect Of Hyposalivation On Mastication And Mandibular Movements During Speech. Brazilian Oral Research, 25(4), 351–356.
- [7] Al-Dwairi Z, Lynch E. Xerostomia In Complete Denture Wearers: Prevalence, Clinical Findings And Impact On Oral Functions. Gerodontology. 2014 Mar;31(1):49-55.
- [8] Lu, TY., Chen, JH., Du, JK. Et Al. Dysphagia And Masticatory Performance As A Mediator Of The Xerostomia To Quality Of Life Relation In The Older Population. BMC Geriatr 20, 521 (2020).
- [9] Gurkar H, Venkatesh OY, Somashekar JM, Gowda MH, Dwivedi M, Ningthoujam I. Prosthodontic Management Of Xerostomic Patient: A Technical Modification. Case Rep Dent. 2016;2016:8905891.