Xerostomia in controlled and un controlled diabetic patients

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اهداء

بسم الله الرحمن الرحيم

"مَنْ عَمِلَ صَالِحًا مِنْ ذَكَرٍ أَوْ أُنْثَى وَهُوَ مُؤْمِنٌ فَلَنُحْيِيَنَّهُ حَيَاةً طَيِّبَةً"

انطلاقاً من قوله سبحانه وتعالى قد عملنا طيلة عام دراسي كامل بتفانٍ لأجل تقديم بحث موضوعي وعملي يقدم فائدة عملية وعلمية ويمثل إضافة لكلية طب الأسنان/جامعة بابل.

الى كل من اضاء بعلمه عقل غيره

او هدى بالجواب الصحيح حيرة سائليه

فأظهر بسماحته تواضع العلماء

وبرحابته سماحة العارفين

الى الخالق الذي هدانا ومكننا وانعم علينا ولولاه ما كنا لنكمل الطريق

الى اهلنا الذين دعمونا وقدموا لنا كل وسائل الراحة

الى معلمينا واساتذتنا الذين علمونا ومحو الجهل عن عقولنا

الى جميع أطباء وأساتذة وموظفي جامعة بابل /كلية طب الأسنان

نتقدم بالشكر الجزيل والامتنان إلى

الدكتور مهدي يعكوب

الدكتورة لمى وتوت

الأستاذة انفال إحسان

Abstract

Background

Diabetes mellitus (DM) is a highly prevalent disease worldwide which currently affects 347 million people according to the World Health Organization. There are complications of diabetes which are little known either to healthcare professionals or to the patients themselves, including periodontal disease and other manifestations in the oral cavity such as xerostomia, a burning sensation, and increased infection.

Aims of the study

The aim of this study was to assess whether patients with un Controlled DM have a greater frequency of xerostomia than Control DM or not and measuring salivary flow rate to both of them.

Patients and methods

A study was conducted in 50 patients, 25 with control DM and 25 with un control DM, who attended the outpatient endocrinology clinic of the hospital from January 2024 to April 2024. Patients gave their written informed consent to participate in this study. Study variables included age, sex, type of DM, time since the onset of DM.
Unstimulated whole saliva was collected through Navazesh method and the salivary flow rate was measured (ml/min). Xerostomia was evaluated via Fox's test.

Results

The mean salivary flow rate in type I diabetics (0.35±0.11 ml/min) was lower than that in control I (0.50±0.07 ml/min) (p=0.01). The same difference was observed between type II diabetics (0.37±0.13 ml/min) and control II groups (0.47±0.11 ml/min) (p=0.01).

Conclusion

Un controlled Diabetic patients have lower salivary flow than controlled patients .

Keyword

Diabetes mellitus (DM**),** xerostomia**,** flow rate

CONTENTS

1. Introduction

Diabetes mellitus is a metabolic disease which is characterized by chronic hyperglycemia. In type I diabetes, insulin secretion is absent due to the destruction of pancreatic beta cells. Type II diabetes is specified by the resistance of peripheral tissues to insulin and relative decrease in insulin secretion *(Glick M. Burket's Oral Medicine*)

The prevalence of diabetes has multiplied worldwide within the recent decades, which has caused it to become an issue of public health, particularly in developing societies *(López-Pintor RM, Casañas E, González-Serrano J, Serrano J, Ramírez L, de Arriba L, et al.*)

Long-term hyperglycemia results in broad systemic complications, namely, cardiovascular diseases, neuropathy, and nephropathy(*uzuya T, Nakagawa S, Satoh J, Kanazawa Y, Iwamoto Y, Kobayashi M, et al)*

Moreover, oral manifestations such as saliva secretion impairments, periodontitis, delayed wound healing, and burning mouth increase in diabetic patients.

Glycemic control plays a key role in initiation and development of many signs and symptoms (Malicka B, Kaczmarek U, Skośkiewicz-Malinowska K.)

Reduced salivary flow rate and dry mouth cause dental caries, oral candidiasis, difficulty in swallowing and speaking; which, in turn, affects the oral health-related quality of life (Chavez EM, Taylor GW, Borrell LN, Ship JA). Xerostomia is the subjective feeling of a patient describing dry mouth, which is, in fact, a symptom not a disease. It should be noted that complaints of oral dryness should not always be considered as salivary glands disorder, because xerostomia can also occur as a result of dehydration, oral sensory disturbances, psychological condition, and central cognitive alteration.

The flow rate of normal unstimulated saliva is 0.3–0.5 ml/min. If it decreases to less than 0.1–0.2 ml/min, one would experience xerostomia*(*Malicka B, Kaczmarek U, Skośkiewicz-Malinowska K)

In true xerostomia, a malfunction occurs in salivation. It is accompanied by increased risk of oral mucosal lesions, oral infections and dental caries. Hence, it is quite important to correctly discern the true and the false xerostomia. Dentists play an imperative role in this context. The subjective xerostomia can be evaluated through various questionnaires; namely, Fox's test, which is a standard questionnaire whose reliability and validity has previously been proven *(*Fox PC, van der Ven PF, Sonies BC, Weiffenbach JM, Baum BJ)

Moreover, few studies have simultaneously assessed xerostomia and salivary flow in type I and II diabetic patients. Thus, the current study was aimed at evaluating the subjective xerostomia and the salivary flow rate in type I and II diabetic

patients, in comparison with healthy controls. (Malicka B, Kaczmarek U, Skośkiewicz-Malinowska K)

2. Aims of the study

The aim of this study was to assess whether patients with un Controlled DM have a greater frequency of xerostomia than Control DM or not and measuring salivary flow rate to both of them.

2.Patients and methods:

- A study was conducted in 50 patients, 25 with control DM and 25 with un control DM, who attended the outpatient endocrinology clinic of the hospital from January 2024 to April 2024. Patients gave their written informed consent to participate in this study. Study variables included age, sex, type of DM, time since the onset of DM.
- Unstimulated whole saliva was collected through Navazesh method and the salivary flow rate was measured (ml/min). Xerostomia was evaluated via Fox's test.

The patients were selected according to the following criteria:

-Control Type 1 Diabetic pt

-Type 1 Diabetic pt

- Control Type 2 Diabetic pt

-Type 2 Diabetic pt

-Age between 30-60 yrs

- Patient not taking any medication effect on salivary flow

The patient comfortably erect in the dental chair and allow the saliva to collect in the floor of mouth for 3-5 minutes and the morning sample was collected. The patient was also enquired about the consumption of any liquid, foodstuffs and alcohol 12 hours prior to sample collection. The samples of whole unstimulated saliva were collected by spitting method. Whole unstimulated saliva was collected by asking the patient to spit into a sterile, open mouthed, labeled, plastic container for 10 minutes. The saliva was collected.

Fox test ,This test which is a standard questionnaire whose reliability and validity has previously been proven, consisted of ten questions with yes/no answers. Four positive answers out of ten were considered as positive xerostomia**.**

Statistics:

By using Navazesh method & Fox test we collect 50 samples half of them was women and the rest was men.

ANOVA test was used and (p=0.01). that indicates there is no significant difference in salivary flow between controlled diabetic patient and un controlled diabetic patients.

3. Results and Discussion

3. 1 Gender distribution of participants:

A total of fifty participants were enrolled in the study. There were 25 males and 25 females with1:1 male to female ratio .The age ranged between 30- 60 years old with the median age 45 years old.

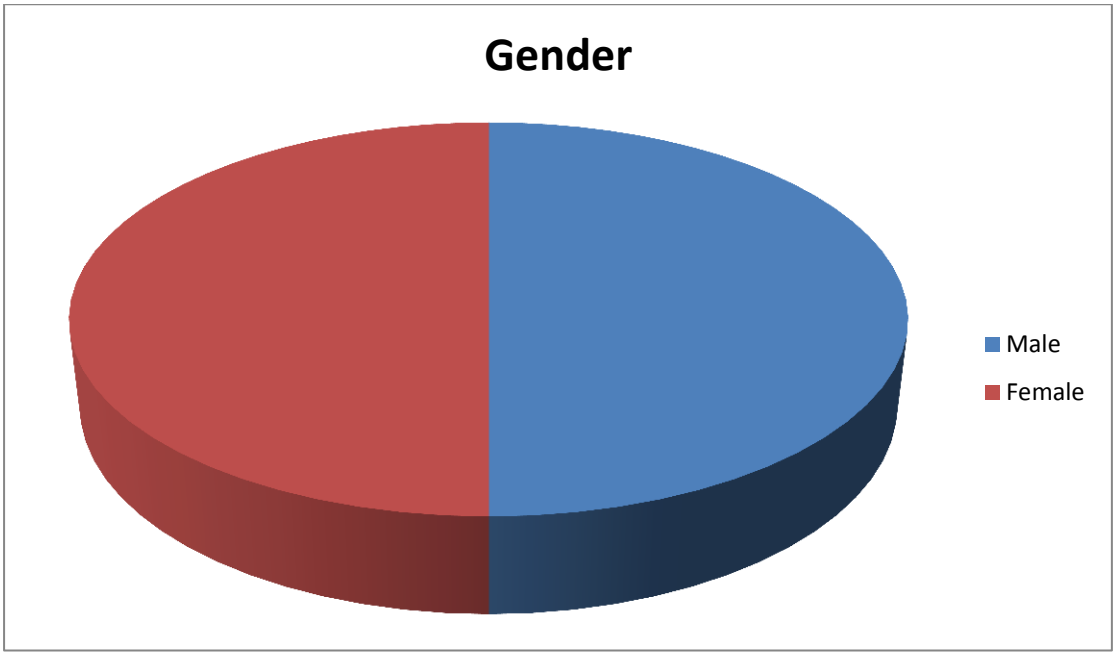

Figure (3-1): Gender distribution of patients

3.2 The mean±SD of salivary flow rate and total scores of Fox's test in diabetics and control groups

Comparisons	Salivay flow rate (ml/min) (mean±SD)	mean scores of Fox's test (mean±SD)
DM type I	0.35±0.11	2.70±2.50
Control I	0.50±0.07	1.17±1.60
p-value	0.01	0.01
DM type I I	0.37±0.13	2.65±2.20
Control II	0.47±0.11	1.62±1.50
p-value	0.01	0.02

4. Discussion:

Several studies have evaluated the salivary changes in diabetic patients; however, few studies have assessed xerostomia as well as salivary flow rate (Panchbhai AS, Degwekar SS, Bhowte RR) The present study investigated the salivary flow rate and xerostomia in type I and II diabetic patients. The findings indicate a significant decrease of the salivary flow rate in both type I and II diabetes. (Bakianian Vaziri P, Vahedi M, Mortazavi H, Abdollahzadeh Sh, Hajilooi M)

the samples in the study groups had only diabetes, and no other systemic disease. Among the several reasons which contribute to the decreased salivary flow rate in diabetes, lies the fact that following the hyperglycemia and glucosuria, body fluids are more excreted, and subsequently, secretion of saliva is reduced. Additionally, pathologic changes in the structure of salivary glands neuropathy of the sympathetic and parasympathetic system, and microvascular disorders, disrupt saliva production. It must be noted that the weaker the diabetes is controlled, the more drastic these changes would be(Carda C, Mosquera-Lloreda N, Salom L, Gomez de Feraris ME, Peydro A).

it is noteworthy that the mean age of patients in type II is generally higher; consequently, higher autonomic and peripheral neuropathies as well as more age-related vascular changes are observed in this group. On the other hand, the disease duration is longer in patients with type I diabetes; hence, they more deeply experience the complications of

hyperglycemia such as paresthesia, xerostomia, and polyuria. The degree of disease control is quite an important factor in both types of diabetes (Little JW, Falace DA, Miller CS, Rhodus NL).

Concerning the variety of intervening factors in each type of diabetes, and the fact that it cannot be predicted which factor is more influential; it can be stated that the current study did not find any considerable difference in the salivary flow rate. With respect to the current findings, it can be announced that xerostomia in both type I and II was higher than that in control I and II

In order to justify their findings, they claimed that type II diabetic patients would less feel the xerostomia probably due to aging, peripheral neuropathies, baroreceptors, and oral mucosa changes(Ben-Aryeh H, Serouya R, Kanter Y, Szargel R, Laufer D)

There are different indices to assess the subjective xerostomia. The present study made use of the satndard Fox's test, whose validity and reliablity has been already approved (Fox PC, van der Ven PF, Sonies BC, Weiffenbach JM, Baum B). We observed no significant difference in xerostomia between the two types of diabetes. It was clear there was not a significant relation between xerostomia and type of diabetes. However, xerostomia might be - not only related to the salivary flow rate, but also to the organic and inorganic content of the saliva (Bakianian Vaziri P, Vahedi M, Mortazavi H, Abdollahzadeh Sh, Hajilooi M). This study found that the lower the salivary flow rate was, the higher the xerostomia was in diabetic patients. Xerostomia can indicate decreased salivary flow. It can greatly help faster diagnosis of reduced salivary flow in diabetic patients and early control of salivary flow complications. Diabetes affects not only the quantity, but also the quality of saliva (Newrick P, Bowman C, Green D, O'Brien I, Porter S, Scully C, et al). Thus, it can be stated that reduced salivary flow on one side, and changes in the components of saliva on the other side can create xerostomia. The current study was only a quantitative assessment of saliva rate.

Therefore, further studies are suggested to evaluate the quality of saliva in addition to its quantity.

5. Conclusion:

The results of this research showed that the salivary flow rate decreases in patients with un controlled diabetes type I and II in comparison with controlled individuals, and un controlled diabetic patients experience more severe xerostomia. But due to the limitations of this research, further investigations with larger sample sizes are needed to evaluate the quality and quantity of saliva.

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