Original article:

Comparative evaluation of stimulated salivary flow in between diabetic and non diabetic subjects wearing complete denture

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Abstract:
Diabetes mellitus is a complex polygenic disorder in which common genetic variants interacts with environmental factors to unmask the disease and is commonly found in dental patient. Patients with a diagnosis of diabetes mellitus present 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 with reduced salivary flow commonly report specific symptoms such as a sensation of dry mouth and burning, mastication and speech difficulties, dry lips, altered taste, and a lack of adaptation to the complete denture. The aim of the present study was to compare diabetic and nondiabetic subjects wearing complete dentures regarding salivary flow of different age group. Thirty subjects, 15 with and 15 without a diagnosis of diabetes, were matched for gender, race, and age.

Keywords: Diabetes mellitus, Salivary flow, Stimulated saliva, Xerostomia

I. Introduction
Diabetes mellitus is a chronic metabolic disorder characterized by hyperglycemia, associated with irregularities in the metabolism of carbohydrates, lipids, and 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 reason due to which early tooth loss occur. It was found that the direct correlation exist 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 peripheralvascular 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 anamnesis and clinical examination is necessary, since 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. Bergdahl and Bergdahl showed that 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.

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. Most of the diabetic people are under continuous medication and psychological treatment which affects the denture tolerance so the aim of the study is to evaluate and compare the stimulated salivary flow in diabetic and non diabetic subjects wearing complete denture.

The aim of the present study was to compare diabetic and nondiabetic subjects wearing complete dentures regarding salivary flow of different age group. The research hypotheses were: oral mucosal lesions are more frequent in complete denture-wearing subjects with diabetes which may be due to reduced salivary flow and also causes subjective feelings of denture instability in patients with diabetes so this study is aimed to relate the change in stimulated salivary flow and diabetes mellitus.

II. Material and methods:
30 subjects were selected in Department of Prosthodontics, Sharad Pawar Dental College, Sawangi (Meghe) Wardha out of which 15 subjects were diagnosed with type 2 diabetes and considered as experimental group. Another 15 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 TMJ 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:**
  1. Only patient with type 2 diabetes

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

**Method**
Patient is instructed to chew chewing tablets [sugar free] for one minute and sample is collected in a graduated test tube after one minute the process is repeated once a day on alternate day for three days with each individual.

![Saliva collector](image-url)
III. Result

Table 1: Comparison of mean saliva in both the groups

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>15</td>
<td>1.38</td>
<td>0.21</td>
<td>0.05</td>
<td>12.68</td>
<td>0.000, S, p&lt;0.05</td>
</tr>
<tr>
<td>Experimental</td>
<td>15</td>
<td>0.48</td>
<td>0.16</td>
<td>0.04</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comparison of the 2 groups revealed significant difference in mean (SD) salivary flow between the control group (1.38(0.21) mL/min) and the diabetic group (0.48(0.16) mL/min) t=12.68 (p<0.05).

IV. Discussion

The salivary flow rate differs between the groups, and feelings of denture instability were reported. The results support the research hypothesis that salivary flow is decreased in complete denture-wearing subjects with diabetes compared to controls.

The data supports the research hypothesis that oral mucosal lesions are more frequent in complete denture-wearing subjects with diabetes.

Wu AJ and Ship JA\(^1\) observed that xerostomia and salivary gland hypofunction are associated with sundry 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. The chewing-stimulated whole salivary flow rate was \(< 0.7 \text{ ml/min}\)

Navazesh et al\(^2\) 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.

V. Conclusion

Within the limitations of this study, significant differences were observed in salivary flow, self-reported denture retention, or oral mucosal lesions when comparing diabetic and nondiabetic subjects.

References

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