

## Effect Of Oral Hypoglycemic Drugs On Salivary Flow - A Review

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**Abstract :** Xerostomia, or dry mouth, is the abnormal reduction of saliva and can be a symptom of certain diseases or be an adverse effect of certain medications. Long-standing xerostomia (dry mouth) has many causes, but drug-induced xerostomia is the most common type. Several drugs are known to cause a reduction in salivary flow rate when taken either singly or in a combination with other drugs, for a long period of time. The common health related problems for which most people are under medication are hypertension, arthritis, diabetes and constipation. This article reviews on the effect of oral hypoglycemic drugs on the salivary flow.

**Keywords:** Xerostomia, Medication, Salivary flow.

### **Introduction:**

Better health care facilities and improved standard of living have been the key factors responsible for the increase in the average life expectancy of an Indian since 1951.<sup>[1]</sup> Studies have revealed that the most common health related problems among the elderly Indians are hypertension, arthritis, diabetes and constipation. Several of these diseases and the medications used for them can cause reduction in the salivary flow.<sup>[1]</sup>

Good oral health, including salivary function, is very important in maintaining whole body health.<sup>[2]</sup> The ever-expanding list of medications is linked to pathologic reactions in the oral and perioral region. The adverse drug reactions have a broad spectrum of clinical manifestations. The clinical patterns of adverse drug reactions of the oral cavity include xerostomia, swelling, nonspecific ulceration, vesiculobullous or ulcerative mucositis that mimics other disease states, nonspecific vesiculoulcerative mucositis, pigmentation, gingival enlargement, and bisphosphonate-related osteonecrosis of the jaws.<sup>[3]</sup>

Xerostomia, or dry mouth, is the abnormal reduction of saliva and can be a symptom of certain diseases or be an adverse effect of certain medications. Xerostomia, is the most common adverse drug-related effect in the oral cavity. To date, xerostomia has been associated with more than 500 medications.<sup>[4]</sup> In addition, habits such as smoking, alcohol consumption, and even long-term use of caffeinated drinks may contribute to oral dryness or the perception of dryness.<sup>[3]</sup>

An average person produces at least 500 mL of saliva over a 24-hour period. Salivary flow rates vary considerably during any one 24-hour period depending on the demand or the current physiologic status of the patient. The unstimulated/resting flow rate is 0.3 mL/min, whereas the flow rate during sleep is 0.1 mL/min; during eating or chewing, it increases to 4.0 to 5.0mL/min.<sup>[4]</sup>

Adequate amounts of saliva are very important and essential to denture wearers. Wearing complete dentures can be an extremely uncomfortable experience for the people with Xerostomia. Dentures stay in place comfortably and in a stabilized manner by development of an intimate interface between denture surfaces and the soft tissues they rest upon. Presence of adequate amounts of saliva within this denture/tissue interface is essential. Without enough saliva, a denture will inadequately adhere to tissues, partly through loss of suction.<sup>[5]</sup>

This article reviews the effect of oral hypoglycemic drugs, used by diabetic patients, on the salivary flow rate.

### **Oral Hypoglycemics And Salivary Flow:**

Long-standing xerostomia (dry mouth) has many causes, but drug-induced xerostomia is the most common type.<sup>[3]</sup> Medication and psychological processes may affect salivary flow and cause subjective oral dryness.<sup>[6]</sup> Xerostomia is considered to be a subjective feeling and can be assessed by directly questioning the individuals along with sialometry.<sup>[3]</sup>

Shetty's study has indicated that the severity of the xerostomia increases among the elderly due to a synergistic effect when taking multiple medications. Their study included 3 groups- group A had subjects with no long term medication, group B had patients with intake of a single xerostomic drug and group C had patients with intake of multiple xerostomic drug. Of these, group B had 55% of subjects who used oral hypoglycemics. The mean unstimulated salivary flow rate was 1.5mL/5min in group A and 0.7mL/5 min in group B, which indicates that oral hypoglycemic drugs cause xerostomia. The study also concludes that, its combination with other drugs taken for systemic diseases produces a further decrease in salivary flow rate.<sup>[7]</sup>

Bakianianvaziret *al.* compared the salivary flow rate in diabetic patients with healthy controls. They collected the saliva from the subjects by Navazesh method<sup>[8]</sup> the results concluded that the salivary flow rate was significantly lower in diabetic patients. In addition, DMFT was higher in diabetic patients than the controls.<sup>[9]</sup>

Cristina de Lima D compared the diabetic and non diabetic subjects wearing complete dentures with regard to salivary flow, salivary buffering capacity, denture retention and oral mucosal lesions. Within the limitations of this study, no significant differences were observed in salivary flow, denture retention or oral lesions in diabetic and non-diabetic subjects.<sup>[10]</sup>

Sreebny LM, Yu A, Green A, Valdini A concluded that, the salivary flow rates of the diabetic subjects was consistently lower than those of healthy, nondiabetic control subjects, as a result of their study. The mean, resting, and whole-saliva flow rate was abnormally low in 43% of the diabetic patients who complained of xerostomia.<sup>[11]</sup>

Meurman *et al.* studied the flow rate and organic constituents of whole saliva in relation to autonomic nervous function in patients with non-insulin dependent diabetes. No difference was seen in flow rate between the patients with diabetes and the control subjects. Saliva secretion might be more affected by xerogenic drugs and autonomic nervous dysfunction in patients with non-insulin-dependent diabetes than in nondiabetic control subjects.<sup>[12]</sup>

Dodds, Yeh and Johnson conducted a study to determine whether saliva output and composition are altered in type 2 diabetes mellitus by comparison with a healthy, non-medicated control group, and also a group of hypertensives. Both diabetic and hypertensive subjects had reduced output of both stimulated and unstimulated submandibular/sublingual saliva. They concluded that diabetics may be more prone to oral dryness and infections than non-diabetics.<sup>[13]</sup>

### **Conclusion:**

Several medications lead to reduction in salivary flow. Several studies have been conducted to see the effect of oral hypoglycemic drugs on salivary flow rate and many of them led to a positive result. Even though there are several studies related to this topic, there is no sufficient data about each drug. Further studies are required on the individual drugs, to analyze their effects. All these findings may attribute to reduce xerostomia by either altering the drugs or dosage.

**Acknowledgement:**

We are grateful to the authors/reviewers/editors of various articles/data bases from which the sources for compilation of this article is taken from.

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