



## RESEARCH ARTICLE

### TO EVALUATE AND COMPARE THE EFFECT OF MOUTHWASHES ON CHANGE IN SALIVARY VOLUME IN PATIENTS TAKING POLYPHARMACY

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#### ABSTRACT

Saliva is a most valuable oral fluid that is often taken for granted. It is critical to the preservation and maintenance of oral health, yet it receives little attention until quantity or quality is diminished. The quantity of the saliva affects its ability to carry out the functions in the oral cavity including retention of the denture. Usually mouthwashes are an antiseptic solutions intended to reduce the microbial load in the oral cavity, although mouthwashes might be given for other reasons such as for their analgesic, anti-inflammatory or anti-fungal action. Most of the denture wearers are elderly patients who are on polypharmacy which can affect quality and quantity of saliva.

**Aim of the study:** To evaluate and compare the salivary volume in patients taking Polypharmacy before and after using Herbal and commercially available mouthwash.

**Methodology:** For the study a total of 10 patients taking Polypharmacy were selected based on inclusion criteria and were divided into two groups. In one group Saliva was collected by using a test tube with measurements and the final volume was noted before and after using herbal mouthwash.

In another group Saliva was collected by using a test tube with measurements and the final volume was noted before and after using commercially available mouthwash.

**Results:** Mouthwashes may disturb the healthy balance of the biofilm moisturizing the oral mucosa. Statistically significant reduction in salivary volume was found in using commercially available mouthwash ( $p > .025$ ) than herbal mouthwash ( $p > .038$ ).

Thus this paper discusses about a study to evaluate and compare the salivary volume in patients taking polypharmacy before and after using herbal and commercially available mouthwash.

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## INTRODUCTION

Saliva is a most valuable oral fluid that often is taken for granted. It is critical to the preservation and maintenance of oral health, yet it receives little attention until quantity or quality is diminished (Sue P. Humphrey *et al.*, 2001). There has been much recent research on the topic of salivary dysfunction as it relates to disease or as a side effect of certain medications. The quantity of the saliva affects the ability of saliva to carry out its functions in the oral cavity. The importance of the regulation of the quantity of the saliva can also be seen in physiological diseases such as salivary gland hypofunction, wherein the lack of saliva results in dental caries and other conditions (Chevalier *et al.*, 2015). Mouthwash is a liquid which is held in the mouth passively or swilled around the mouth by contraction of the perioral muscles. Usually mouthwashes are an antiseptic solutions intended to reduce the

microbial load in the oral cavity, although mouthwashes might be given for other reasons such as for their analgesic, anti-inflammatory or anti-fungal action. Most of the denture wearers are elderly patients who are on polypharmacy which can affect quality and quantity of saliva (Chevalier *et al.*, 2015). For Prosthodontist, quantity of saliva is of special interest as it affects retention of the denture, speech, swallowing, enhances taste. Reduced quantity of saliva can lead to compromised antimicrobial activity in the oral cavity, to counter which, most of the patients are advised to use mouthwashes. Such studies which measure the effect of mouthwashes on quantity of saliva have not yet been reported. Therefore the aim of the study was to evaluate and Compare the Effect of Mouthwashes on Change in Salivary Volume in Patients Taking Polypharmacy.

## MATERIALS AND METHODS

This study has been approved by the ethical committee of JSS UNIVERSITY, MYSURU. A total of 10 patients who are on

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polypharmacy were selected from the outpatients in the Department of Prosthodontics & Crown and Bridge, JSS Dental College and Hospital, Mysuru for the study based on the inclusion criteria.

**Inclusion criteria**

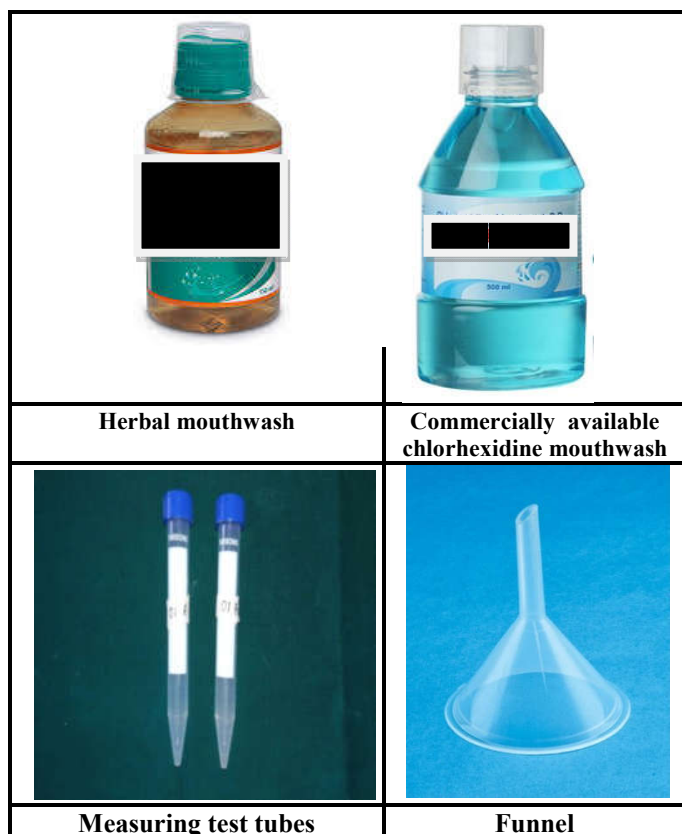
1. Patients willing to participate in the study by signing the consent form.
2. Patients who are on polypharmacy for the last 6 months.
3. Patients in the age group of 30-65 years.
4. Patients wearing complete dentures or removable partial dentures.

**Exclusion criteria**

1. Non ambulatory patients.
2. Smokers.
3. Tobacco chewers.
4. Patients undergoing or underwent radiation therapy.

**Materials used**

1. Herbal mouthwash
2. Commercially available mouthwash
3. Measuring test tube
4. Funnel



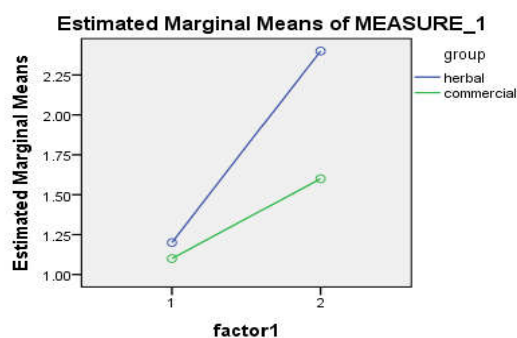
30 minutes prior to the sample collection patients were asked not to eat and drink. Sample collection preceded with rinsing mouth using distilled water for 30 seconds. Head of the patient was leaned forward, over the test tube and funnel. Saliva was drained into the tube by slightly opening of the mouth. Remaining Saliva was spit into the tube and the final volume was noted. In (group A) Patients were given herbal mouthwash and were instructed to use it twice a day for a period of 2 weeks. After 2 weeks, patients were recalled for collection of the second saliva sample. Again saliva was collected by using a graduating cylinder and the final volume was noted. In (group B) after giving chlorhexidine mouthwash patients were instructed to use it twice a day for a period of 2 weeks. After 2 weeks, patients were recalled for collection of the second saliva sample. Again saliva was collected by using a test tube and the final volume was noted. After collection of the data, results were statistically analysed and compared.

**RESULTS**

The collected data were analyzed using Mann-Whitney U test and Wilcoxon test.

**Table 1. Volume of saliva in both before and after giving herbal (Group A) and commercially available chlorhexidine (Group B) mouthwashes**

GROUP A			GROUP B		
Sample no	Before	After	Sample no	Before	After
01	1.5(ml)	2.5(ml)	01	1(ml)	1.5(ml)
02	2	3	02	1.5	2
03	1	2.5	03	1.5	2
04	1	2.5	04	1	1.5
05	0.5	1.5	05	0.5	1



**Graph 1. Estimated Marginal Means of Measure\_ Herbal mouthwash shows more significant increase in quantity of saliva than commercially available chlorhexidine mouth wash**

**Table 2. Comparison of salivary flow between two groups before and after giving mouthwashes**

	Before mouthwash	After mouthwash
Mann-Whitney U	11.500	3.000
Wilcoxon W	26.500	18.000
Z	-.219	-2.041
Asymp.sig. (2tailed)	.827	.041
Exact sig. [2*(1-tailed sig.)]	.841 <sup>b</sup>	.056 <sup>b</sup>

a. Grouping variable: group  
b. Not corrected for ties

**METHODOLOGY**

10 Patients were divided equally into 2 groups:

**Group A:** 5 Patients were asked to use herbal mouthwash

**Group B:** 5 Patients were asked to use commercially available chlorhexidine mouthwash.

Table 2- Shows After analysing the data, it shows that volume of saliva was statistically non significant before giving mouthwashes in both groups. After giving mouthwashes the results shows that it is statistically significant in both groups.

**Table 3. Comparison of salivary flow within group**

Group		FNL AFTER-BEFORE
Herbal	Z	-2.070 <sup>b</sup>
Asymp. Sig. (2-tailed)		.038
Commercial	Z	-2.236 <sup>b</sup>
Asymp. Sig. (2-tailed)		.025

a. Wilcoxon signed Ranks Test

b. Based on negative ranks.

Table 3 Shows the statistical analysis states that volume of saliva was statistically significant with in both groups (herbal mouth wash group and hexidine mouth wash group)

## DISCUSSION

Saliva is a most valuable oral fluid that often is taken for granted. Saliva activities host anti caries impact as well as antifungal, physical and immunological protection for oral and gastrointestinal mucosa. Changes in the quality and amount of saliva might cause distorted oral function and dryness of oral mucosa such as traumatic lesions due to prosthesis, and in total fungal infection which can impair the quality of life (Sue P. Humphrey *et al.*, 2001). In addition to aging, polypharmacy plays an essential role in xerostomia and the change in flow rate of saliva. It is beyond discussion that side effects of several medicines for people who take psychotropic, anti-hypertension and diuretic medicines serve as an etiological factor in the change in saliva flow rate. It is critical to the preservation and maintenance of oral health, yet it receives little attention until quantity or quality is diminished (Chevalier *et al.*, 2015). There has been much recent research on the topic of salivary dysfunction as it relates to disease or as a side effect of certain medications. Antiseptic mouthwashes are recommended as daily oral care products to fight mouth dryness, dental caries and gingival inflammation. Till now literature which measure the effect of mouthwashes on quantity of saliva have not yet been reported. This study showed that in a study group of 10 individuals taking polypharmacy, the use of Antiseptic mouthwashes (commercial mouth wash & herbal mouth wash) showed their individual effect on salivary volume. The use of a particular genre of mouthwash continues to be a debatable argument. In the recent times the use of herbal mouth washes is on the rise due to the spread in the awareness of the effect of complementary and alternative medicine. It is also due to the much stronger belief that the alternative therapy is with less side effects. Review of literature reveals that commercial mouthwashes which contain alcohol concentration may affect the quantity of saliva (Carretero-peláez *et al.*, 2004; Dirk W. Lachenmeier *et al.*, 2009). This study shows that commercial mouthwashes which contain alcohol might decrease the quantity of saliva compared to herbal mouthwashes. On the basis of results herbal mouthwash showed a more significant increase in the quantity of saliva

## Limitations

1. Mechanism behind the increase in quantity of saliva was not evaluated, further studies are required for a better understanding.
2. Variety of herbal mouthwashes are available, action of some herbal mouthwashes could differ from this study.
3. This study reports the change in the quantity of saliva that occurred in a month, long term studies must be taken up to evaluate the precise effect of mouthwashes.
4. The drugs taken by the patients were not same in all the cases, different drugs could affect salivary quantity in different manner, studies should be done on similar set of drugs for better results.

## Conclusion

On the basis of results and within the limitations of this study, it can be concluded that Herbal and commercially available mouthwash effects the quantity of Saliva. Herbal mouthwash showed a more significant increase in the quantity of saliva. Hence, prescribing the mouthwashes should be cautiously done in the patients taking polypharmacy. Denture wearers on polypharmacy should be routinely followed up to check the change in the salivary flow which may affect the denture retention.

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