

Comparison of the efficacy of herbal mouth rinse with commercially available mouth rinses: A clinical trial

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Abstract

Aim: The aim of the study was to compare the efficacy of an herbal mouthwash containing red ginseng extract with different brands of commercially available chemical mouthwashes.

Objective: The objective of the study was to evaluate the effectiveness of herbal mouthwash (Dr. Dental care liquid) in reducing the oral bacterial count and compare it with the efficacy of commercially available mouthwashes such as Rexitine, Listerine and Colgate Plax.

Materials and Methods: The study includes sixty normal individuals (aged 18–24 years) who were divided into four groups of 15 individuals each. The participants of each group were given four different mouthwashes (Dr. Dental Care liquid, Colgate Plax, Listerine and Rexitine) and asked to use it twice daily for 5 days. Saliva samples were collected before the use of mouthwash and also after 5 days of using the mouthwashes. Culture and microscopic examination of salivary samples was done, and oral bacterial load present in the saliva samples was counted before and after the mouth rinse use.

Results: The results were compared using Wilcoxon sign-rank test. Among the four mouthwashes, the herbal mouthwash, Dr. Dental care liquid exhibited maximum efficacy in reducing the amount of bacteria followed by Colgate Plax, Listerine and Rexitine.

Conclusion: The herbal mouthwash, Dr. Dental care liquid, contains red ginseng extract, a herb with immense medicinal values. In this study, the herbal mouth rinse exhibited increased antibacterial action compared with other commercially available chemical mouth rinses. Hence, we conclude that the ginseng-containing herbal mouthwash can be considered as a safe and effective oral hygiene aid.

Keywords: Mouthwash, oral hygiene, red ginseng

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Received: 10.10.2017, **Accepted:** 28.05.2018

INTRODUCTION

Maintenance of oral hygiene is imperative in preventing the buildup of plaque, a sticky film of bacteria and food that accumulates on teeth. Oral hygiene measures include mechanical aids such as toothbrushes, floss, interdental cleansers and chemotherapeutic agents

such as mouthwashes, dentifrices and chewing gums. Mouthwashes (mouth rinses) are solutions or liquids intended to reduce the microbial load in the oral cavity. They provide a safe and effective chemical means of reducing or eliminating plaque accumulation. They also help in removing or destroying bacteria, relieving

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Website:

www.jomfp.in

DOI:

10.4103/jomfp.JOMFP_303_18

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How to cite this article: Jeddy N, Ravi S, Radhika T, Sai Lakshmi LJ. Comparison of the efficacy of herbal mouth rinse with commercially available mouth rinses: A clinical trial. *J Oral Maxillofac Pathol* 2018;22:332-4.

infection of oral tissues, preventing dental caries, masking bad breath, etc. Most of the mouthwashes available in the market contain alcohol and other chemicals such as chlorhexidine gluconate and triclosan.^[1] These chemicals cause various side effects ranging from taste disturbance to allergic contact stomatitis. To overcome such side effects, nontoxic herbal mouthwashes using various herbs and plant extracts have been introduced.^[2] Various studies have been conducted to show the effectiveness of herbal mouthwashes. Among these herbal products, the green tea extract has gained much importance. The present study compared the effectiveness of an herbal mouthwash containing red ginseng extract (Dr. Dental care liquid) with different brands of commercially available mouthwashes (Colgate Plax, Listerine and Rexidine) in reducing the oral bacterial count. The composition of Dr. Dental care liquid is given in Table 1.

MATERIALS AND METHODS

The study was conducted using the saliva samples of the dental students of Thai Moogambigai Dental College and Hospital, Chennai, Tamil Nadu, India. The ethical clearance was obtained from the Ethical Committee of Dr. M.G.R Educational and Research Institute. The study participants were clearly informed about the study and a written informed consent was obtained.

A total of 60 dental students between the age ranges of 18–24 who did not have any systemic illness were divided into four groups of 15 individuals each. The participants of each group were given four different mouthwashes (Dr. Dental Care liquid, Colgate Plax, Listerine and Rexidine). They were asked to gargle 8 ml of the given mouthwash for 30 s to 1 min twice daily for 5 days. Saliva samples were collected before the use of mouthwash and also 5 days after using mouthwash. The oral bacterial load present in the saliva samples was counted before and after the mouth rinse use. Bacterial count (colony-forming unit/ml; cfu/ml) in each sample was determined by culture and microscopy at the Department of Microbiology, A.C.S Medical College and Hospital, Chennai.

RESULTS

The mean bacterial count before using the mouthwashes was 231.0×10^{-3} cfu/ml (Dr. Dental care liquid), 166.6×10^{-3} cfu/ml (Colgate Plax), 187.07×10^{-3} cfu/ml (Listerine) and 157.3×10^{-3} cfu/ml (Rexidine), respectively. The mean bacterial count after using the mouthwashes was 69.6×10^{-3} cfu/ml (Dr. Dental care liquid), 24.6×10^{-3} cfu/ml (Colgate Plax), 56.6×10^{-3} cfu/ml

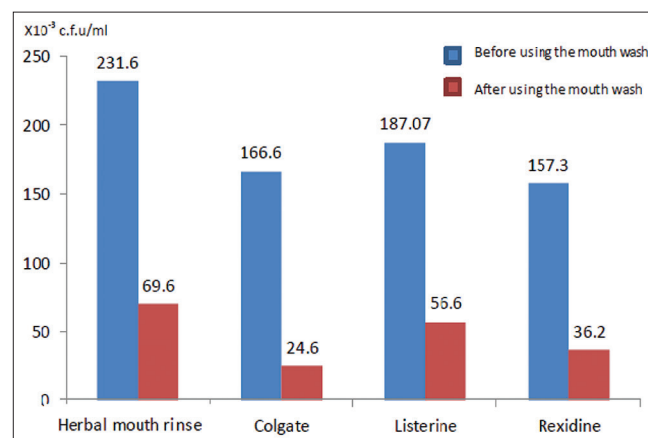
(Listerine) and 36.2×10^{-3} cfu/ml (Rexidine), respectively [Graph 1]. The bacterial count in the samples collected before and after using each mouthwash for 5 days was compared using Wilcoxon sign-rank test [Table 2]. The results showed that, among the four mouthwashes, the herbal mouthwash, Dr. Dental care liquid reduced the maximum amount of bacteria with a mean of 161.9332×10^{-3} cfu/ml followed by Colgate Plax (142.000×10^{-3} cfu/ml), Listerine (130.4672×10^{-3} cfu/ml) and Rexidine (121.1332×10^{-3} cfu/ml). The difference between the groups was statistically significant ($P = 0.0001$).

DISCUSSION

The use of natural products is always recommended to reduce the usage of chemicals causing human and environmental risk. The commercially available mouthwashes contain many chemicals causing various ill effects. Their constituents include water which is the chief constituent, ethanol, dyes, surface active agents, zinc chloride/acetate, aluminum potassium sulfate (astringent) and phenolic compounds, quaternary ammonium compounds and essential oils such as oil of peppermint

Table 1: Composition of Dr. Dental care liquid herbal mouthwash

Ingredients	Uses
Red ginseng extract	Antioxidant, anti-inflammatory, antiallergic agent
Xylitol	Stimulates saliva secretion which acts as a buffer against acidic environment created by microorganisms
<i>Swertia japonica</i> extract (Swertia)	Anti-inflammatory, antibacterial, antifungal
<i>Camellia sinensis</i>	Antibacterial agent
Allantoin	Prevents gingivitis
Licorice	Antimicrobial, antioxidant, anti-inflammatory and breath freshener
Caramel	Flavoring agent
Menthol	Breath freshener
Deionized water	Base
Sodium fluoride	Arrest caries, treats dental hypersensitivity



Graph 1: Mean bacterial count before and after using the four different mouthwashes

Table 2: Mean bacterial count reduced by four different mouthwashes (Wilcoxon sign-rank test)

Mouthwash used before-after	Paired differences					t	df	Significant (two-tailed)
	Mean of reduced bacterial count ($\times 10^{-3}$ cfu/ml)	SD	SEM	95% CI of the difference				
				Lower	Upper			
Herbal mouthwash B-A	161.9332	86.72655	22.39270	113.90577	209.96090	7.232	14	0.0001
Colgate plax B-A	142.000	51.96152	13.41641	113.22467	170.77533	10.584	14	0.0001
Listerine B-A	130.4672	64.54330	16.66501	94.72378	166.20956	7.829	14	0.0001
Rexidine B-A	121.1332	77.70445	20.06320	78.10205	164.16462	6.038	14	0.0001

CI: Confidence interval, SD: Standard deviation, SEM: Standard error of mean

(as antibacterial agents) among others.^[1] Minor and transient side effects of commercial mouthwashes are very common such as taste disturbance, tooth staining, sensation of a dry mouth and discoloration. Alcohol-containing mouthwashes worsen halitosis by causing dryness of mouth. Soreness, ulceration, chemical burn and redness may sometimes occur (e.g., aphthous stomatitis and allergic contact stomatitis) if the person is allergic or sensitive to mouthwash ingredients such as preservatives, coloring agents, flavors and fragrances. Such effects can be reduced or eliminated by diluting the mouthwash with water or using a different mouthwash (e.g., salt water). To overcome such side effects, the World Health Organization advises researchers to investigate the possible use of natural products such as herb and plant extracts. Herbs and plant extracts have been used in oral hygiene products for many years.^[2] The present study was done using a nonalcoholic herbal mouthwash containing red ginseng extract.

Red ginseng is an herb native to Northern Hemisphere in Eastern Asia (mostly Northern China, Korea and Eastern Siberia). Ginseng contains 12 types of bioactive chemical substances also known as ginsenosides. Ginseng exhibits numerous medicinal values and can be used as tonic (especially over the nervous system), antioxidant, anti-inflammatory, antiallergic, anticarcinogenic, anti-Parkinson's, antidepressive, hypotensive, hypoglycemic and hypocholesterolemic agent which has been proved by several studies. In addition to these effects, the herb also stimulates healing process, has a positive effect over blood circulation and improves the function of lungs.^[3,4] Ginseng extracts are now the area of interest for many researchers as it has a plenty of medicinal values. Its antiviral property against gamma herpesvirus^[5] and photochemoprotective activities against ultraviolet rays affecting the skin were studied recently.^[6]

Dr. Dental care liquid, the herbal mouthwash used in this study, uses red ginseng extract as a major ingredient. This nonalcoholic mouthwash also contains various herbs and natural products such as *Swertia japonica* extract, *Camellia sinensis*, *Licorice*, xylitol, Caramel and menthol. Thus, the ingredients present in this mouthwash are absolutely natural and are nontoxic. Moreover, dilution with water is not needed for its usage. The present study was intended to determine the

efficacy of this herbal mouth rinse and to compare it with the commercially available mouth rinses (Colgate Plax, Listerine and Rexidine). The results of the study proved that the herbal mouthwash effectively reduced the harmful bacteria in oral cavity and can be used as a safer oral hygiene aid.

CONCLUSION

"To go organic" is the theme of the present day. In accordance to the fact, several herbal products are available in the market today. As far as dentistry is concerned, nontoxic herbal mouthwashes using various herbal extracts have been introduced. Among other herbal products used in mouthwashes, red ginseng gains importance because of its abundant medicinal values. The study proved that the development of mouthwash containing red ginseng extract is a boon to the field of dentistry in eradicating harmful oral bacteria. Hence, we conclude that the herbal mouthwash, Dr. Dental care liquid, effectively reduces the oral bacteria when compared to the other commercially available chemical mouth rinses and provides a safe and effective practice of oral hygiene.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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