

# Comparison of the Effectiveness of a Commercially Available Herbal Mouth Rinse with Chlorhexidine Gluconate at the Clinical and Patient Level

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## Abstract:

Oral hygiene is the practice of keeping the mouth clean and healthy by brushing and flossing to prevent tooth decay and gum disease. The purpose of oral hygiene is to prevent the build up of plaque, the sticky film of bacteria and food that forms on the teeth. The removal of plaque is utmost important to control dental caries. The key to good oral health is hidden in nature. Natural herbs like neem, tulsi, pudina, clove oil, ajwain, triphala and many more has been used since ages either as a whole single herb or as a combination against various oral health problems like bleeding gums, halitosis, mouth ulcers and preventing tooth decay. So the aim of the present study is to compare the effectiveness of a herbal mouth rinse with chlorhexidine gluconate mouth rinse at the clinical level in reducing *Streptococcus mutans* count. A randomized study was carried out on 30 patients who have dental caries. Out of which 15 subjects were given herbal mouthwash to rinse twice a day for five days. The other 15 were given 0.12% chlorhexidine mouthwash to rinse twice a day for five days. Saliva sample were collected prior to the use of mouth wash and after five days and *Sreptococcus mutans* count was done in terms of colony forming units per ml (CFU/ml). The results of the present study showed that herbal mouthwash can cause inhibition of bacterial growth.

**Key words:** Streptococcus mutans, mouth wash, anti plaque.

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## INTRODUCTION:

Oral hygiene is the practice of keeping the mouth clean and healthy by brushing and flossing to prevent tooth decay and gum disease. The purpose of oral hygiene is to prevent the build up of plaque, the sticky film of bacteria and food that forms on the teeth. Plaque also irritates gums and can lead to gum disease (periodontal disease) and tooth loss. Tooth brushing and flossing remove plaque from teeth, and antiseptic mouth washes kill some of the bacteria that help form plaque

Plaques plays an important role in development of gingivitis when in contact with the gingival tissues and, therefore, plaque control represents the cornerstone of good oral hygiene practice. The tools most commonly used in mechanical supragingival plaque control are the toothbrush (manual or electric), floss, woodsticks, and interdental brushes. Despite the availability of these various oral hygiene devices, even the most meticulous patient will not always completely remove all plaque. Evidence indicates that the degree of motivation and skill required for the effective use of these oral hygiene products may be beyond the ability of the majority of patients The removal of plaque is utmost important to control dental caries that is commonly maintained by mechanical methods.

Caries is an interaction between genetic and environmental factors in which social, behavioral, psychological, and biological factors are expressed in a highly complex interactive manner. [1] But the important part in the understanding of the caries process is that it does not occur in the absence of dental plaque or dietary fermentable carbohydrate hence, it is considered as a dieto bacterial disease. [2] The role played by bacteria in initiation of dental caries and periodontal diseases [3] is well established.

Mouthwashes (mouthrinses) are solutions or liquids used to rinse the mouth for a number of purposes :(a) to remove or destroy bacteria (b) to act as an astringent (c) to deodorise and (d) to have a therapeutic effect by relieving infection or preventing dental caries[4]. They come under the broad blanket of chemical plaque control agents.Commercially available artificial drugs have unpleasant side effects and moreover, the number of drug resistant microorganisms is increasing. The people not using mouthwash also experience difficulty in maintaining adequate plaque control, particularly at interproximal sites, which necessitates the use of chemotherapeutic agents for control of plaque.[5] Among herbal and chemical mouth wash such as chlorhexidine mouthwashes, chlorhexidine is the "gold-standard" or positive control for comparison with other substances due to its proven efficiency [6],[7].Though effective, it has certain side effects like brown discoloration of the teeth, oral mucosal erosion, and bitter taste. Hence, there is need of an alternative mouth rinse that could negate all the side effects of chlorhexidine, but yet effective equivalent to it. Using an antiseptic mouth rinse to supplement mechanical plaque removal can produce an antimicrobial effect throughout the mouth. Chemical agents in a mouth rinse should be effective at modifying the microbiota by selectively eliminating pathogens without negatively impacting the normal flora that may result in an overgrowth of pathogenic organisms [8]. Evidence shows that the long-term twice daily use of 0.12% chlorhexidine gluconate will reduce the plaque control. The aim of the study was to compare the effectiveness of this herbal mouthrinse with Chlorhexidine Gluconate, which is considered to be the gold standard.

**Natural dentists herbal mouth wash:**

Herbal medicine is both promotive and preventive in its approach. It is a comprehensive system, which uses various remedies derived from plants and their extracts to treat disorders and to maintain good health [9]. Natural herbs like triphala, tulsi patra, jyestiamadh, neem, clove oil, pudina, ajwain and many more used either as whole single herb or in combination have been scientifically proven to be safe and effective medicine against various oral health problems like bleeding gums, halitosis, mouth ulcers and preventing tooth decay. The major strength of these natural herbs is that their use has not been reported with any side-effects till date. Apart from this, all herbal mouthrinses do not contain alcohol, sugar, artificial colour artificial sweetener (such as saccharine), stannous fluoride (processed form of fluoride that can stain teeth) and cetylpyridinium chloride that can also cause staining, two of the most common ingredients found in most other over-the-counter products. The problem of these ingredients is that the microorganisms that cause bad breath and halitosis love to feed on these ingredients, and release by products that cause halitosis. Thus, by use of a herbal mouth rinse, we can avoid these ingredients and get better oral hygiene and better health.

**Table 1: Natural dentists herbal mouthwash ingredients, source and its purpose:**

Ingredients	Source	Purpose
Aloe vera	Aloe vera plant	Antigingivitis, prevent bleeding gums
Purified water	local source	Base
Vegetable glycerine	Rapeseed oil	Base
Echinaecea	Plant	Anti inflammatory
Golden seal	Plant	Antibacterial
Calendula	Plant	Wound healing
Citric acid	Corn	Preservative
Polysorbate 80	Polyethoxylated sorbent and oleic acid	Emulsifier
Natural flavours (includes cinnamon oil)	Essential oil	Flavors
Grapefruit seed extract	Plant	Antibacterial
Pottasium citrate	Pottasium salts	Ph balance
Copper chlorophyllin colour	Plant	Colour

**Chlorhexidine gluconate mouthwash:**

Chlorhexidine gluconate is the most effective antiseptic mouth rinse available today. Chlorhexidine tightly binds to tooth structure, oral tissues and dental plaque and releases slowly, resulting in 8 to 12 hour substantivity. Chlorhexidine (CHX) is considered the most common and extensively studied chemical agent for plaque control to date. It has been used as an adjunct to mechanical plaque control such as tooth brushing and oral prophylaxis for the maintenance of proper oral hygiene. In spite of potent antimicrobial and anti plaque properties of chlorhexidine,

its widespread and prolonged use is limited by its local side effects. The adverse effects of chlorhexidine include extrinsic staining of teeth, transient impairment of taste sensation and taste perturbation [10], enhanced supragingival calculus formation and less commonly, desquamation of the oral mucosa. The mechanisms of action for this mouth rinse are rupturing of the bacterial cell membrane resulting in cell death and inhibiting pellicle formation and plaque colonization [11]. Chlorhexidine has been shown to penetrate dental plaque biofilm killing pathogens. Due to the reduced effectiveness caused by positively charged dentifrice ingredients interacting with chlorhexidine, it is recommended to rinse 30 minutes after tooth brushing. Chlorhexidine gluconate can be alcohol or non-alcohol based. The most commonly prescribed chlorhexidine product contains alcohol. Chlorhexidine gluconate provides the greatest anti-plaque and anti-gingivitis benefits available today, the negative side effects associated with long term use and limited availability (prescription only) may decrease patient compliance.

**MATERIALS AND METHODS:**

A randomized study was carried out on 30 patients who have dental caries. Saliva samples were collected prior to the procedure in a sterile container. As soon as the samples are collected they are sent to the lab to check for streptococcus mutans level by culture method. Out of which only 15 subjects were given herbal mouthwash to rinse twice a day for five days. The other set of subjects were given 0.12% chlorhexidine mouthwash to rinse twice a day for five days. After five days saliva samples were collected from them in a sterile container. Finally the mutans level were compared and tabulated.

**RESULT:**

Comparison of mutans streptococcus score in chlorhexidine group with respect to prerinse and postrinse

0.12% chlorhexidine mouth wash	Mean value $\pm$ SD	P value
Prerinse (0 day)	60024 $\pm$ 14.3	0.009
Postrinse (5 <sup>th</sup> day)	12 $\pm$ 4.19	

Comparison of mutans streptococcus score in plaque in combination mouth rinse group with respect to prerinse and postrinse

Herbal mouth wash	Mean value $\pm$ SD	P value
Prerinse(0 day)	80012 $\pm$ 29.8	0.016
Postrinse(5 <sup>th</sup> day)	37.8 $\pm$ 19.3	

P value is calculated by Mann Whitney U test

**DISCUSSION:**

The present study was designed to determine the efficacy of a herbal mouthrinse (Natural dentist) with 0.12% Chlorhexidine Gluconate. Saliva is continually refreshed, rinsing away the active ingredients of mouth rinse. But plaque remaining after mechanical cleaning absorbs mouth rinse antimicrobials, serving as a reservoir to prolong the

product's substantivity. Plaque most frequently remains in fissures, interproximal spaces and at the gingival margin where antimicrobial activity is needed most. This theory does not promote incomplete oral hygiene, but does reduce the negative effects of plaque left behind and reinforces the benefits of mouth rinse use in patients with poor plaque control[12].The high efficacy of chlorhexidine could be due to its bactericidal action during the time of application followed by bacteriostatic action due to adsorption at the tooth surface.

The results of the present study , showed that herbal mouthwash can cause inhibition of bacterial growth. Bacterial plaques have been proved to have a role in the etiology of dental caries and periodontal diseases. The use of mouth washes as disinfectants can help mechanical methods to reduce plaques [13].According to many studies that have been conducted on the effects of mouthwashes on oral micro organism[14], the chlorhexidine mouth wash is the most superior amongst all mouthwashes. Chlorhexidine mouthwash is more effective in reducing *S.mutans* in plaques indicates the high anti microbial activity of chlorhexidine mouthwashes. In the present study herbal mouth wash was checked for its antibacterial activity in comparison with chlorhexidine mouth wash and results showed that herbal mouth wash is less potent than conventional mouth wash in use.

#### CONCLUSION:

Herbal medicine is both promotive and preventive in its approach. The major strength of these natural herbs is that their use has not been reported with any side-effects till date.From this study herbal mouth wash is as effective as the chlorhexidine gluconate rinse as shown in the result,thereby it an inhibiting the growth of oral bacteria in vitro.

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