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Comparison of Herbal Mouth Wash with Conventional Mouth Wash in Use in Reducing Streptococcus Mutans -An Invitro Study

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Abstract :

The aim of this present study is to estimate the antibacterial effect of herbal mouth wash in comparison with conventional mouth wash in reducing streptococcus mutans count. Usually mouthwashes are an antiseptic solution intended to reduce the microbial load in oral cavity. Herbal mouth washes helps in prevention of cavities, restores enamel, strengthens teeth, kills bad breath germs, cleans the whole mouth and freshens breath. In this in vitro study, isolated colonies of Streptococcus mutans was prepared for an antimicrobial mouth rinse test. The tube dilution method was used for determining the minimum inhibitory concentrations (MIC) and minimum bactericidal concentrations (MBC). The result shows that herbal mouthwash has got antimicrobial activity equal to the activity of conventional chlorhexidine mouth wash.

Keyword : Mouth wash, dental caries, anti-bacterial,streptococcus mutans.

INTRODUCTION :

Dental caries or cavities, more commonly known as tooth decay, are caused by a breakdown of the tooth enamel. This breakdown is the result of bacteria on teeth that breakdown foods and produce acid that destroys tooth enamel and results in tooth decay. Although dental caries are largely preventable, they remain the most common chronic disease of children aged 6 to 11 years and adolescents aged 12 to 19 years (1,2). The mouth contains a wide variety of oral bacteria, but only a few species of bacteria are believed to cause dental caries; Mutans streptococcus and Lactobacilli (3-5). The elimination of cariogenic bacteria from the oral cavity using antibacterial agents is one of primary strategies for prevention of dental caries (6). Medicated oral rinses usually contains antimicrobial agents, such as chlorhexidine gluconate which is very potent chemo-prophylactic agent, it has abroad spectrum action especially against Mutans Streptococci group. But it has many side effect like staining of teeth, altering the test of the mouth and desquamation of oral mucosa (7,8).Herbs are being widely explored to discover alternatives to synthetic antibacterial agents. Most people use clove (Lavanga)as a spice and are largely unaware of its numerous health benefits.It contains an anesthetic chemical compound called eugenol, which numbs nerves and stops pain. The essential oil of clove is also an antiseptic which helps to eliminate oral bacteria. It has antibacterial, analgesic, antiviral, anti-inflammatory, antifungal and is considered useful. For all of the above this study was conducted.

In this article, the research was done with herbal mouth wash which has ingredients as follows,

Lavanga (Syzygium aromaticum), peppermint satva (Menthapiperita), tailaparnah(Eucalyptus globulus), tvak(Cinnamon zeylanicum), jatiphala (Myristica fragrans),barbari (Ocimumbasilicum).

Clove (Lavanga) :

contains an anesthetic chemical compound called eugenol, which numbs nerves and stops pain. The essential oil of clove is also an antiseptic, which helps eliminate oral bacteria.

Peppermint oil:

Peppermint essential oil gives a cooling sensation and has a calming effect on the body, which can relieve sore muscles when used topically. It also has antimicrobial properties so it can help freshen bad breath and soothe digestive issues. Peppermint is a hybrid species of spearmint and water mint (Mentha aquatica).

Myristica fragrans :

Myristica fragrans exhibits good potential against oral pathogens. Myristica fragrans gave higher inhibitory and bactericidal activities than their ethyl acetate extracts. The antibacterial activities of the extracts against both Gram-positive cariogenic and Gram-negative periodontopathicbacteria have confirmed its broad-spectrum antibacterial activity. Thus, Myristica fragrans should be considered having beneficially potential in dentistry field as mouth wash.

Ocimum basilicum: It has antimicrobial properties so it can help freshen bad breath.

MATERIALS AND METHODS :

In this in vitro study, isolated colonies of Streptococcus mutans was prepared for an antimicrobial mouth rinse test. The tube dilution method was used for determining the minimum inhibitory concentrations (MIC) and minimum bactericidal concentrations (MBC).

The minimum inhibitory concentration (MIC) was used to evaluate the inhibitory effects of herbal mouthwash.Ten sterile test tubes were collected and 1 mL of sterile tryptic soy broth (Blood agar, Merck Germany) was added to each tube. Next, 1 mL of various dilutions of herbal mouth wash [1000µl to 1.9µl]was added to all the test tubes. A bacterial suspension of 1.5x108 cfu equal to No. 0.5

McFarland standard was prepared from streptococcus mutans.

An amount of 1 mL of the dilute suspension was added to each set of 10 tubes that contained TSB medium and mouthwash.After the bacterial suspension was added to the test tubes, the tubes were placed in a incubator and were incubated at 37°C for 24 - 48 hours. After this period was elapsed, the tubes were examined for the presence of turbidity, which indicates microbial growth. The last tube or the last dilution of mouthwash at which turbidity was not observed, was considered as the MIC. The same procedure was followed for conventional mouth wash and he result was compared in terms of ability to inhibit microbial growth. After 24 hours of incubation, the tubes without turbidity (transparent), which indicated the inhibition of bacterial growth by the respective mouthwash, were transferred to a solid medium (Blood agar) and were evaluated in terms of microbial growth to determine the MBC of mouthwashes. The last tube, which was negative in terms of culture on solid medium, indicated the minimum bactericidal concentration (MBC) of mouthwashes.

RESULTS :

The Mouthwashes stopped tested microorganism, and had bactericidal effects. The MICs of herbal and conventional chlorhexidine mouth wash for S. mutans were 7.81 and 3.9(µg/mL) respectively (Table 1). The MBCs of herbal and conventional chlorhexidine mouth wash for S. mutans were 15.62 and 3.9(µg/mL). The result shows that herbal mouthwash has got antimicrobial activity equal to the activity of conventional chlorhexidine mouth wash.

Table 1 :
Minimum Inhibitory Concentration and Minimum Bactericidal Concentration (µg/mL) of herbal and convenional chlorhexidine Mouthwashes Against oral Pathogenic Bacteria Determined by the Tube Dilution Method.

	MIC (µg/mL)	**MBC (µg/mL)**
Herbal mouth wash	7.81	15.62
Conventational Mouth wash	3.9	3.9

DISCUSSION :

The results of the present study, showed that herbal mouthwash can cause inhibition of bacterial growth. Bacterial plaques have been proven to have a role in the etiology of dental caries and periodontal diseases. The use of mouthwashes as disinfectants can help mechanical methods to reduce plaques (9). Mouthwashes with antimicrobial effects perform this task using three methods, which include apoptosis, inhibition of bacterial growth and/or cell metabolic inhibition; and depending on their concentration their bactericidal and/or bacteriostatic properties vary. (10).

According to many studies that have been conducted on the effects of mouthwashes on oral microorganisms (11,12), the chlorhexidine mouthwash is the most superior amongst all mouthwashes. Chlorhexidine mouthwash is more effective in reducing S. mutans in plaques indicates the high antimicrobial activity of chlorhexidine mouthwashes. In the present study herbal mouth wash was checked for is antibacterial activity in comparison with chlorhexidine mouth wash and results showed that herbal mouth is as equivalent to conventional mouth wash in use.

CONCLUSION :

Herbs, which are powerful healing agents, must be used appropriately. Herbs contain active ingredients that may interact negatively with prescribed medications or other remedies. It is wise, therefore, to consult a health-care professional in situations in which you question the appropriateness of the herb or its interaction with other remedies. . The use of herbs in dentistry should be based on evidence of effectiveness and safety. The anti-bacterial activities could be enhanced if active components are purified and adequate dosage determined for proper administration. The present results therefore offer a scientific basis for traditional use of herbal mouth wash.

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