

Original Research Article

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Evaluation of Anti-Caries effect of Essential Oil Mouthwash

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ABSTRACT

The aim of this study was to compare and evaluate the anti-caries effect essential oil mouthwash (EOM) and 0.2% Chlorhexidine mouthwash (CHX), on patients who have risk of caries. The evaluation was done clinically and microbiologically. The efficacy of three antiseptic mouth rinses was evaluated in this study for 30 patients; (15 patients in each group) with risk of dental caries. Oral hygiene index-simplified, plaque index and gingival index were recorded. The saliva samples were collected from the volunteers before and after 10 minutes after rinsing. Reduction of bacteria was then evaluated according to total number of colony forming unit (CFU) per ml. Plaque reduction showed, Oral hygiene index-simplified (OHI-S) reduction with 29% was seen in the CHX group and in the EOM group with 53%, Plaque index (PI) reduction 14.6% and 0.6%, Gingivitis index (GI) reduction 11.7% and 16% for CHX and EOM respectively. The EOM has anti-caries and antiseptic effectiveness as CHX. Essential oil mouthwash is safe alternative for CHX.

Keywords

Essential oils,
Mouthwash, Dental
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Introduction

Dental caries, which is also referred to as tooth decay or cavities, is one of the most common and widespread persistent diseases

today and is also one of the most preventable. Management of dental caries focuses on limiting tooth demineralization by altering the dietary habits, preventing or modifying oral microbial growth, altering the salivary pH and

buffering capacity (1). The primary etiological agents of dental caries are *Streptococcus mutans* (2). They easily colonize the tooth and initiate acid production by producing extracellular polysaccharides from sucrose foods (3). Hence, caries prevention program primarily should be aimed at reducing the cariogenic bacteria. Mouthwashes are liquids which contain anti-inflammatory, antimicrobial, and analgesic action. There are two types of mouthwash- chemical and herbal. Chlorhexidine mouthwash comes under chemical mouthwash. Chlorhexidine was developed in 1950, which is still considered the most effective anti-plaque agents in dentistry (4). Many of the plant extracts has an anti-microbial property which is effectively used in maintaining good oral hygiene.

Natural herbs such as triphala, tulsipatra, neem, clove oil, pudina, and many others are used as single or in combination have been scientifically proven to be safe and effective medicine against oral health problems such as bleeding gums, halitosis, mouth ulcers, and preventing tooth decay without side effects (5).

Even though, CHX is more effective in plaque control, it cannot be used for long duration because some of its unpleasant side-effects after long duration usage pay more attention toward herbal drugs. Plants extracts demonstrate effects that are immune enhancing, anti-inflammatory, anti-cancer, etc. (6). In this paper we aim to evaluate the efficacy of EOM against dental caries compared to CHX.

Materials and Methods

Study population

A total of 30 patients with a high caries risk were included in the study. Ethical Committee approval was obtained. All patients subjected

for the study were informed about study protocols and written consent was obtained. They were randomly divided into three groups using each containing 15 patients (n = 30); Group 1; 1-2% aqueous extract of essential oil mouth wash; Group 2; 0.2% CHX mouth wash. Patients were asked to wash and retain the respective mouth rinse in the mouth for 40 seconds before expectorating it. Patients were not allowed to consume any diet or drink orally for following 10 minutes.

Clinical investigation

Oral hygiene index-simplified (7), PI and GI were recorded at baseline and after 20 days for both the groups regarding oral hygiene and periodontal status (8, 9). Percentage of reduction was calculated.

Laboratory analysis for anti-caries effect

Pre-rinse and post-rinse salivary samples after 10 minutes were collected in the same manner as was carried out for the salivary buffering capacity analysis using Mitis Salivarius agar. The microbial analysis was assessed by dilution and Spread plate technique. The saliva samples were diluted and streaked on petri plates followed by incubation for 72 hours at 37°C. After incubation, the colony forming units were recorded and mean percentage of reduction (PR) was calculated.

Statistical analysis

The results were tabulated and statistically analyzed using one-way analysis of variance using Microsoft excel.

Results and Discussion

The clinical investigation showed good plaque reduction for both CHX and herbal mouthwash. OHI-S Reduction with 29% was seen in the CHX group and in the EM group

with 53%. Similarly for GI, a quit good reeducation was seen 11.7% in case of CHX and 16% for EOM with statically significant reduction within each group before and after the treatment; $P=0.006$ for CHX and $P=0.001$ for EOM. These results were similar to a study by *Southern et al.*, in 2006 which showed reduction in GI only in the CHX group (10). In current study PI didn't show significant difference within groups. Results obtained by *Shetty et al.*, showed no significant difference between the PI scores between both the groups (11). Table 1 shows the percentage of reduction percentage of *Streptococcus mutans*. (PR) There was a significant PR between the pre-rinse and post-rinse samples. EOM showed highly significant

antibacterial activity compared with CHX and against *Streptococcus mutans*. EOM (74.7%) and CHX (70.5%) showed antibacterial activity against *Streptococcus mutans* with no significant difference. Similar results were obtained by several studies which had evaluated all the 40 strains of microorganisms using different microbial the results showed that the herbal and essential oils mouth rinse inhibited the growth of most of the forty test species (12).

The results of this study showed improvement of oral hygiene and anti-caries effect of EOM compared to CHX mouthwash. Essential oil mouthwash can provide safe effective alternative to chemical mouth wash (Table 2).

Table.1 The clinical parameters from baseline till follow-up for chlorhexidine and herbal mouthwash groups

CHX Reduction percentage		EOMReduction percentage	
OHI-S	29 %		53%
PI	14.6%		0.06%
GI	11.7%		16%

Table.2 The microbial reduction percentage for CHX and herbal HM

CHX mouthwash	EOM mouthwash
70.5 %	74.7 %

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