



## RESEARCH ARTICLE

# ANTIBACTERIAL ACTIVITY OF LOZENGES AGAINST ENTEROCOCCUS FAECALIS FROM DENTAL CARIES

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### ABSTRACT

The antibacterial activity of using lozenges in controlling E. faecalis causing dental caries were not reported widely. Thus, the aim of the present study was to determine the antibacterial activity of different lozenges such as Strepsils, Koflet and Stodal against E. faecalis isolated from dental caries. Based on our study, Strepsils has higher antibacterial activity against E. faecalis and has a MIC value of 1:3. Stodal as a homeopathic lozenges did not show any activity. This indicates the role of lozenges in controlling dental caries.

## INTRODUCTION

The human dental cavity is colonized with large groups of aerobic and anaerobic bacterial species. *Enterococcus faecalis* as a nosocomial pathogen can cause serious infections that are frequently isolated (30-90%) from root canal treated patients. (Bhalla *et al.*, 2004). The high prevalence of this species in root canal treated patients evidenced by culturing methods, and molecular detection tools suggested that it may be the reason for most of the endodontic treatment failures (Kayaoglu, 2004). The antibacterial activity of using lozenges in controlling E. faecalis causing dental caries were not reported widely (Ritchards, 1993). Thus, the aim of the present study was to determine the antibacterial activity of different lozenges such as Strepsils, Koflet and Stodal against E. faecalis isolated from dental caries.

## MATERIALS AND METHODS

### Clinical isolates

A total of 20 different non-repetitive dental caries isolates of E. faecalis were collected included in this study.

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These isolates were identified by standard biochemical parameters as described by elsewhere. Isolates were preserved in semi-solid brain heart infusion medium and stored at 4°C until further use.

### Antimicrobial susceptibility test

Antibiotic susceptibility test was determined for these strains to routinely used antibiotics such as ampicillin (10μ), vancomycin (30μ), teicoplanin (30μ), erythromycin (15μ), ciprofloxacin (5μ), amikacin (200μ), gentamycin (10μ), tetracycline (30μ) and linezolid (30μ) (Hi Media, Mumbai) by kirby-bauer disc diffusion method (Clinical Laboratory Standards Institution, 2004).

### Detection of antibacterial activity of lozenges against *Enterococcus faecalis*

Antibacterial activity of three lozenges against *Enterococcus faecalis* were determined by Minimum Inhibitory Concentration (MIC) method. Lozenges were diluted in sterile saline and the following dilutions were prepared such as 1:1, 1:2, 1:3, 1:4, 1:5 and 1:6. 0.5McFarland standard E. faecalis inoculum was added to each tube and incubated at 37°C overnight. Next day, each drop from each tube have been transferred to sterile Mueller Hinton Agar (MHA) And incubated at 37°C overnight.

The minimal concentration that inhibited the bacterial growth is considered to be the MIC value (Ritchards, 1993).

## RESULTS

### Antibiotic susceptibility pattern

We found increased percentage of isolates were shown to be resistant to all the antibiotics used in this study. For ampicillin, amikacin, erythromycin, gentamicin, our isolates were found to resistant between 80-90%. Better sensitivity was observed in linezolid, teicoplanin and vancomycin antibiotics. The detailed results of antibiotic sensitivity patter of Enterococci was given in Table 1.

**Table 1. Results of antibiotic sensitivity patter of Enterococci**

Antibiotics	Sensitivity	Intermediate	Resistance
Ampicillin	1(5%)	2(10%)	17(85%)
Vancomycin	15(75%)	1(5%)	4(20%)
Teicoplanin	12(60%)	3(15%)	5(25%)
Erythromycin	2(10%)	0	18(90%)
Ciprofloxacin	6(30%)	0	14(70%)
Amikacin	1(5%)	1(5%)	18(90%)
Gentamycin	2(10%)	2(10%)	16(80%)
Tetracycline	4(20%)	4(20%)	12(60%)
Linezolid	18(90%)	1(5%)	1(5%)

### Results of antibacterial activity of different lozenges against dental E. faecalis

We have observed different lozenges showed different MIC values against E. faecalis isolate.

**Table 2. Results of antibacterial activity of different lozenges against dental E. faecalis**

Lozenges	MIC values
Strepsils	1:3
Koflet	1:1
Stodal	-

## DISCUSSION

Study conducted by Prakasam *et al* from Chennai in 2014 demonstrated that, *Acinetobacter* strains were inhibited from 0.06 to 0.25%, 0.25-1% and 0.125-1% for clove, peppermint and eucalyptus oils respectively. In clove oil, 14/50 (28%) isolates were inhibited at 0.06%, 25/50 (50%) at 0.125% and 11/50 (22%) at 0.25% of clove oil.

In peppermint oil, 34/50 (68%) isolates were inhibited at 0.25%, 12/50 (24%) and 4/50 (8%) were at 0.5% and 1% concentrations of peppermint oil respectively. In eucalyptus oils, 10/50 (20%) isolates were inhibited at 0.125%, 18/50 (36%) at 0.25%, 16/50 (32%) and 6/50 (12%) were at 0.5% and 1% respectively. Thus, the MIC of clove oil was found to be 0.06%, 0.25% for peppermint oil and 0.125% for eucalyptus oil (Gopinath Prakasam *et al.*, 2014). In contrast, in our study we have used lozenges instead of using oils or some other herbal medicaments. Wherein, Strepsils and Koflet lozenges showed the MIC values of 1:3 and 1:1 respectively. Whereas, Stodal did not show any promising result in controlling the oral *Enterococcus*.

## Conclusion

Based on our study, Strepsils has higher antibacterial activity against E. faecalis and has a MIC value of 1:3. Stodal as a homeopathic lozenges did not show any activity. This indicates the role of lozenges in controlling dental caries.

## REFERENCES

- Bhalla, A., Pultz, N.J., Gries, D.M., Ray, A.J., Eckstein, E.C., Aron, D.C. *et al.* 2004. Acquisition of nosocomial pathogens on hands after contact with environmental surfaces near hospitalized patients. *Infect Control Hosp Epidemiol.* 25(2):164-7.
- Clinical Laboratory Standards Institution: Performance standards for antimicrobial susceptibility testing. In NCCLS approved standard M2-A8. Wayne, PA USA: CLSI, 2004.
- Kayaoglu, G., Ørstavik, D. 2004. Virulence factors of *Enterococcus faecalis*: Relationship to endodontic disease. *Crit Rev Oral Biol Med.*, 15(5):308-20.
- Ritchards, R.M., Xing, D.K. 1993. Invitro evaluation of the antimicrobial activities of selected lozenges. *J Pharm Sci.*, 82 (12):1218-20.
- Gopinath Prakasam, Manju Bhashini, LakshmiPriya, Srivani Ramesh S. 2014. In-vitro antibacterial activity of some essential oils against clinical isolates of *Acinetobacter baumannii*. *Indian J Med Microbiol.* 32:90-91.

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