



## Effect of Adjunctive Use of Propolis Gel with Non Surgical Treatment in Management of Chronic Periodontitis

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### ABSTRACT

**Purpose:** The goal of this study was to evaluate the clinical effect of propolis gel associated with non surgical therapy in the management of chronic periodontitis. **Subjects and Methods:** Thirty chronic periodontitis patients were selected in this study with probing depth not less than 5 mm in each site. Patients randomly divided into three groups ten subjects on each. Patients in Group1 were treated with scaling and root planning and local delivery of propolis gel with chitosan polymer. Patients in group 2 were treated with non surgical therapy and propolis gel with polyox polymer. Patients in group 3 were treated with non surgical therapy alone. The clinical parameters were assessed at baseline, 1 month and 3 months. **Results:** Clinical parameters showed a favorable improvement in group received propolis gel with polyox polymer than the group received propolis gel containing chitosan polymer. **Conclusion:** Adjunctive use of propolis with polyox polymer to non surgical therapy showed favorable results over use of propolis with chitosan polymer in patients with chronic periodontitis.

### INTRODUCTION

Periodontitis is the disease with inflammatory nature <sup>(1)</sup>. Microbiota in subgingival plaque is initiator of periodontitis; beside the genetic predisposition which modulated host inflammatory reaction to pathogenic bacteria <sup>(2)</sup>.

### KEYWORDS

*Chronic Periodontitis,  
Propolis Gel,  
Non Surgical Treatment.*

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Local delivery therapy is showed great interest nowadays to avoid drawbacks of systemic drugs <sup>(3)</sup>. Moreover, they give promising results in refractory disease and residual probing depths greater than or equal to 5 millimeters with inflammation that are still present following conventional therapies <sup>(4)</sup>.

Mucoadhesive polymers is used in local delivery system due to its ability to increase the time of the drug release .Moreover being nonallergic and nontoxic <sup>(5)</sup>.

Propolis is natural remedies revealed attention over a long period of time being have several beneficial effects as an anti-inflammatory, antimicrobial, antioxidant and immunomodulatory effect <sup>(6)</sup>.

## SUBJECTS AND METHODS

### Preparation of propolis mucoadhesive gels:

By dissolving Propolis (4%), sodium chloride (9%), benzalkonium chloride (0.01%) and mucoadhesive polymer in distilled water at room temperature. Then kept over night to allow polymers to swell. Sodium chloride was used for isotonicity adjustment and benzalkonium chloride was added as a preservative <sup>(7)</sup>.

### Patients selection:

This study was conducted on thirty chronic periodontitis patients. All patients were treated with non surgical therapy and randomly divided into three groups. Group 1: received propolis and chitosan polymer gel , group 2 :received propolis and polyox

polymer gel and group 3: served as a control treated with non surgical therapy only . Clinical parameters as plaque index (PI), Probing pocket depth (PPD) and clinical attachment level (CAL) measurements were measured on the first visit. Then reassessed again at 1month and three months after therapy.

## RESULTS

PI percent change % in group 1 and group 2, group 3 reported non significant changes between groups ( $p=0.142$ ) In the first interval (baseline to 1 month) but statistically significant difference were noted at the second interval (1month to 3 months) for all groups ( $P < 0.0001$ ) and overall from (baseline to 3 months) ( $p=0.035$ ) for all groups .

Probing pocket depth (PPD) percent change % in group 1, group 2 and group 3 demonstrated non significant changes between groups ( $p=0.319$ ). In the first interval (baseline to 1 month) and overall interval from (baseline to 3 months) ( $p=0.135$ ) for all groups but statistically significant difference were noted at the second interval from 1month to 3 months for all groups ( $P = 0.01$ ).

Clinical attachment level (CAL) percent change % in group 1 and group 2, group 3 showed a statistically significant difference were at the first interval (baseline to 1 month)  $p=0.006$ , and overall interval (baseline to 3 months) for all groups.  $p=0.006$  But there is no statistically significant difference at second interval (1months to 3 months)  $p=1$  (Table 1)

**Table (1):** Clinical parameters percent change (%) in different groups at each observation time.

Interval	Group	Mean			Std. Dev			P		
		PI	PPD	CAL	PI	PPD	CAL	PI	PPD	CAL
First interval (Baseline to 1 month)	Group 1	-35	-18.05	-5.93	24.15	8.89	9.87	0.142ns	0.319ns	0.006*
	Group 2	-50	-19.12	-17.26	0	4.46	6.71			
	Group 3	-45	-14.02	-3.67	15.81	8.01	7.77			
Second interval (1 month to 3 months)	Group 1	-10	-0.18 <sup>a</sup>	0	31.62	7.19	0	<0.0001*	0.01*	1ns
	Group 2	-40	-0.2 <sup>a</sup>	0	51.64	6.32	0			
	Group 3	0	0 <sup>b</sup>	0	0	0	0			
Overall (Baseline to 3 months)	Group 1	-40	-19.48	-5.93	31.62	9.36	9.87	0.035*	0.135ns	0.006*
	Group 2	-70	-20.79	-17.26	25.82	6.21	6.71			
	Group 3	-45	-14.02	-3.67	15.81	8.01	7.77			

Significance level  $P < 0.05$ , \* significant, ns= non-significant

Mann Whitney U test: means sharing the same superscript letter are not significantly different

## DISCUSSION

The goal of this study is to evaluate the clinical effect of propolis gel in adjunct to non-surgical therapy in the management of chronic periodontitis.

Gel usage have the advantages of maintaining effective levels of antibacterial agents intrapocket for extended periods of time <sup>(8)</sup>. The microbes harboring the pockets directly targeted by it so altering the subgingival flora <sup>(9)</sup>. Moreover easy of preparation and application being biocompatible and bioadhesive <sup>(8)</sup>.

Propolis is highly regarded for its pharmacological properties as being strong antimicrobial against several pathogens <sup>(10)</sup>. Previous studies reported antibacterial properties of propolis against periodontal pathogens <sup>(11,12)</sup>.

Chitosan used in this study as polymer for its properties as being nontoxic, biocompatible, biodegradable, mucoadhesive, metabolized by certain human enzymes especially lysozyme. These prop-

erties make chitosan a good candidate for conventional as well as novel drug delivery systems <sup>(13)</sup>.

The other polymer used in this study was Polyox. Polyox is ideal choice for time-release formulations <sup>(14)</sup>. In addition polyox showing high water solubility, low toxicity, flow ability and high-binding efficiency <sup>(15)</sup>.

The results of this study were in accordance with the finding of previous studies, where clinical parameters PI, PDD, CAL were reduced <sup>(11, 16, 17)</sup>.

## CONCLUSION

Use of propolis gel associated with non surgical periodontal therapy resulted in a favorable clinical changes. The application of (propolis+polyox) gel giving superior results than (propolis +chitosan) gel. Thus it can be concluded that the polyox polymer enhance the release potential of propolis.

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