

Comparative Evaluation of 25% propolis extracts and 2% chlorhexidine in decreasing bacterial load after sonic activation : An in vivo study

Dr. Vishwabharati I Tayade ¹, Dr. Suyog Jadhav ², Dr. Vijaykumar shiraguppi³

¹ Post graduate student ,Conservative dentistry and endodontics Sarswati Dhanwatari dental college and hospital Parbhani¹

² Dental practitioner ,MDS Conservative dentistry and Endodontics

³ HOD and Professor ,Conservative dentistry and endodontics, Sarswati Dhanwatari dental college and hospital Parbhani¹

Abstract - The aim of this research was to compare and evaluate bacterial load after using two different irrigating solution with sonic activation.

Method: 20 patients indicated for root canal treatment categorized into 2 Groups. Group A (irrigant 25 % Propolis) n=10 Group B (irrigant 2% Chlorhexidine) n = 10 . Sample A1 and B1 were collected immediately after access opening with the help of paper point in both groups.

After complete biomechanical preparation canals were irrigated with 3% sodium hypochlorite , saline followed by sonic activation of 25% Propolis extracts .Same procedure was carried out for sample B2 in which 2% chlorhexidine was sonic activated . The entire sample were placed in liquid agar and incubated at 37 degree Celsius for 24 hrs to determine microbial load by colony forming unit .Statistics were used to tabulate and analyse the result.

Key Words: Propolis ,chlorhexidine ,sonic activation ,bacterial load

1. INTRODUCTION

The primary goal of root canal preparation is to employ an instrument and irrigating fluids to remove bacterially-loaded material from the root canal system. Irrigation lowers the microbial level and its by products while also flushing away loose organic and inorganic leftovers or debris left over from the surgical treatments ¹. Since there is currently no irrigant with perfect qualities, it is widely known that using a combination of auxiliary treatments is essential to produce the intended results . Chlorhexidine

is widely used in intracanal as irrigant solution and medicaments in endodontics .Their antibacterial and various properties brings great place in endodontics. In an attempt to lessen the cytotoxic effects of the majority of the commercially available root canal irrigants, natural products have recently been introduced. The resinous, flavonoid-rich byproduct of honeybees is called propolis, or "bee glue." Its intricate chemical makeup consists of organic substances like flavonoids, terpenes, beta steroids, aromatic alcohols and aldehydes, sesquiterpenes, and stilbeneterpenes, as well as phenolic compounds and esters ². Research has demonstrated the antimicrobial, antifungal, antiviral, hepatoprotective, antioxidant, anticancer, and immunomodulatory properties of propolis ³. Additional propolis has been shown to be beneficial against endodontic infections that are resistant ⁴.



Fig 1: Materials: 2% chlorhexidine, Propolis extracts, sonic activator, 2% paper point

2. Method

The first part of study conducted in Department of conservative dentistry and Endodontics with approval of ethical committee and proper consent of patient. 20 patients indicated for root canal treatment categorized into 2 Groups.

Group A (irrigant 25 % Propolis) n=10 (A1 A2)

Group B (irrigant 2% Chlorhexidine) n = 10 (B1 B2)

Procedure

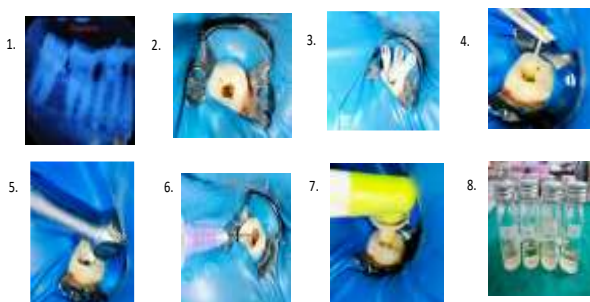


Fig 2:1. Preoperative 2.Access opening 3.Working length determination 4.sample collection with paper point (A1orB1)5.Bmp 6.irrigation 7.sonic activation 8.sample collection in liquid agar(A2or B2)

Under rubber dam isolation with proper local anesthesia access opening was carried out. Sample A1 and B1 taken without irrigation immediately after access opening. Biomechanical preparation complete with sodium hypochlorite and saline immediately Sample A2 and B2 taken after irrigation + sonic activation with 25% propolis and 2% chlorhexidine respectively with paper point. All the specimen were irrigated with sterile 5ml plastic syring and 27 gauge needles with penetration depth 3 mm short of working length. A 5 ml irrigating solvent is taken introduced into the canal and sonic activated for 5 mins.The volume of irrigation were approximately same for all samples (fig 2).

3. Result

Both the parametric and non parametric test was applied. Parametric test used for pre vs. post irrigation activation of two different irrigant.(In Table 1) CFU count of Group A before irrigation and activation was 25210 while for Group B was 25330.

Prior to treatment, Groups A, and B had mean difference CFU counts of aerobes of 1850.0 with p value 0.91 (Table 2), There were not found statistically significant differences as $p > 0.05$ in the mean CFU of aerobes in any of the two groups prior to treatment, according to an analysis of variance using the Kruskal-Wallis Test ($p = 0.91$).

There was no need for additional statistical analysis because wilcoxin sign rank test and sign test shows statistically significant differences between comparative the groups.

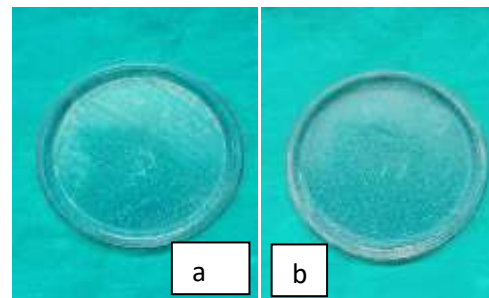


Fig 3 :a. Colonies before irrigation on chrome agar b Colonies after irrigation and activation on chrome agar

Table -1 Comparision in between group A and Group B

sr.no	A1	A2	B1	B2
1	10000	1000	10000	100
2	10000	1000	10000	5000
3	100	10	1000	10
4	10000	1000	10000	100
5	10000	100	100000	100
6	100000	10000	10000	100
7	1000	100	100000	100
8	10000	1000	1000	100
9	100000	10000	10000	1000
10	1000	100	1000	100
	25210	2431	25300	671

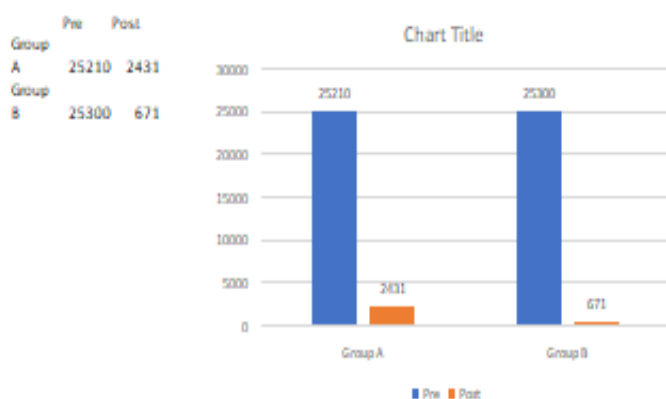


Table -2 : mean value between group A and group B

Group		N	Mean	Std. Deviation	Std. Error Mean	Mean Difference	't'	p value
Pre	Group A	10	25210.000	39646.450	12537.308	90.000	0.005	0.996
	Group B	10	25300.000	39584.088	12517.588			
Post	Group A	10	2431.000	4012.930	1269.000	1760.000	1.294	0.212
	Group B	10	671.000	1548.034	489.531			
Difference	Group A	10	22779.000	35644.557	11271.798	1850.000	0.109	0.914
	Group B	10	24629.000	39856.372	12603.692			

While comparing Group A with Group B all (Pre, Post and Difference) are found non significant as $p > 0.05$

When comparing the assessments conducted before and after the therapy, Group A (2431) and Group B (673) showed the greatest change in aerobic CFU count. After comparison a significant ($p > 0.001$) drop in the mean aerobic CFU count was observed in all four groups (Table 1). Group a > Group b according to this study chlorhexidine shows more decrease in bacterial load than propolis .

4. Discussion:

The current trial's usage of 2% chlorhexidine is supported by data that it has bactericidal effects on pathogenic endodontic microflora⁵. Regarding the 4% DMSO propolis, it is well-established in the literature that 4% propolis .The current trial's usage of 2% chlorhexidine is supported by data that it has bactericidal effects on

microflora. Regarding the 4% DMSO propolis, it is stated from the literature that this concentration of propolis—whether it be ethanolic or dimethyl sulfoxide extract—results in longer-term (>50%) periodontal cell viability (even after 20 hours) and is least cytotoxic when compared to the same concentration (4%) of calcium hydroxide⁶. the least harmful at the same concentration is the ethanolic or dimethyl sulfoxide extract

Numerous studies have demonstrated the significant antibacterial capabilities of propolis. Rahman et al. (2010) found that propolis was a more effective antibacterial agent against Gram positive than Gram negative microbial flora in an in vitro evaluation⁷. Miorin et al. have made similar observations ⁸. Gupta et al. investigated the antibacterial activity of propolis, 0.2% chlorhexidine gluconate, and 3% sodium hypochlorite in vitro against Enterococcus faecalis. They found that 30% propolis in DMSO and 30% propolis in ethyl alcohol had significantly lower efficacies than 0.2% chlorhexidine-

gluconate and 3.0% NAOCL solutions⁹. In this investigation, we found that chlorhexidine was same effective as propolis (particularly in lowering the anaerobic CFU count). The current trial's usage of 2% chlorhexidine is supported by data that it has bactericidal effects on pathogenic endodontic microflora. Regarding the 4% DMSO extract of propolis, it is well known from the literature that this concentration of propolis—whether it be ethanolic or dimethyl sulfoxide extract—results in longer-term (>50%) periodontal cell viability and less cytotoxic after comparing to the same concentration (4%) of calcium hydroxide.

Reference

1. Mohammadi Z. Antibiotics as Intracanal Medicaments: A Review. CDA Journal 137 (2), 9.
2. Sforcin J.M. Propolis and the immune system: a review. J Ethnopharmacology 113, 1–14, 209-108, 2009
3. Dobrowolski JW, Vohorab SB, Sharma K, Shah SA, Naqvi SAH, Dandiya PC. Antibacterial, antifungal, antiamebic, antiinflammatory and antipyretic studies on propolis bee products. J Ethnopharmacology; 35, 77-82. 1991.
4. Kuruvilla J.R., Kamath M.P. Antimicrobial activity of 2.5% sodium hypochlorite and 0.2% chlorhexidine gluconate separately and combined, as endodontic irrigants. J Endod 24:472– 6, 1998.
5. Mohammadi Z., Abbott P.V. The properties and applications of chlorhexidine in endodontics. Int Endod J 42, 288–302, 2009.
6. Al-Shaher A., Wallace J., Agarwal S., Bretz W. Effect of Propolis on Human Fibroblasts from the Pulp and Periodontal Ligament. J Endod 30(5), 359-361, 2004
7. Rahman M.M., Richardson A., Sofian-Azirun M. Antibacterial activity of propolis and honey against Staphylococcus aureus and Escherichia coli. African J Microb Res 4(16): 1872-1878, 2010.
8. Miorin P.L., Levy N.C.J., Custodio A.R., Bretz W.A., Marcucci M.C. Antibacterial activity of honey and propolis from Apis mellifera and Tetragonisca angustula against Staphylococcus aureus. J. Appl. Microb. 95: 913-920, 2003.

5. Conclusion :

By seeing current result of short study, current conclusion was drawn propolis extracts and chlorhexidine both shows antibacterial property against endodontic aerobes. Despite of that many study shows 2% chlorhexidine as intracanal irrigant more superior than herbal extracts. Chlorhexidine have been used for a long time to disinfect infected root canals, relatively new and biogenic substances, like propolis, have opened up new possibilities for a more efficient removal of endodontic pathogenic microflora.

9. Gupta S., Kundabala M., Acharya S.R., Ballal V.D. A comparative evaluation of the antibacterial efficacy of propolis, 3.0% sodium hypochlorite and 0.2% chlorhexidine gluconate against enterococcus faecalis - An in vitro study. Endontology 19(2): 31-38, 2007.
10. Delgado R.J.R., Gasporoto T.H., Sipert C.R., Pineiro C.R., Moraes I.G., Garcia R.B., Bramante C.M., Campanelli A.P., Bernardineli N. Antimicrobial Effects of Calcium Hydroxide and Chlorhexidine on Enterococcus faecalis. JOE 36(8): 1389-1393, 2010
(Size 11, Times New roman)

This document shows the suggested format and appearance of a manuscript prepared for IJSREM journals. Accepted papers will be professionally typeset. This template is intended to be a tool to improve manuscript clarity for the reviewers. The final layout of the typeset paper will not match this template layout.

BIOGRAPHIES (Optional not mandatory)

1st Auth



Dr vishwabharati Tayade
Post graduate student