

Evaluation of Honey as a Root Canal Disinfectant

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SUMMARY

Sixty single rooted teeth were taken to investigate antimicrobial potential of honey. The honey was placed in the canal as intracanal dressing. Microbiological examination revealed that 26 teeth gave positive culture at third day and only 12 teeth gave positive culture at seventh day. These results indicate that honey has an antibacterial property when used as an intracanal medicament. The result of clinical evaluation of post operative pain on 3rd and 7th post operative day showed that honey played a satisfactory role in relieving postoperative pain. The honey also gives good results to eliminate the apical exudation.

Key words: Honey, root canal disinfectant.

INTRODUCTION

Disinfection of root canal is important prerequisite of endodontic therapy¹. The success rate of for endodontic therapy have been reported to vary from 0% to 93%, and the failures have been mostly attributed to the positive pre-Obturation microbial cultures².

Studies have shown that even after complete debridement / cleaning and shaping of root canals, some bacteria do survive; therefore they can grow in empty root canals when no intracanal medicament is used, between appointments^{3, 4}. It has been recommended to use intracanal medicaments in order to achieve bacteria free root canal systems especially in pulpless teeth⁵.

By different trials, the development of antiseptics has led to a broad range of chemical antiseptics, which also, unfortunately have a toxic potential in them. The antibiotics were found to have a minimal efficacy / role as root canal medicaments. In addition, the local use of antibiotics carries the risk of host hypersensitivity and microbial resistance⁶. Calcium hydroxide is also a widely used material in endodontic therapy. Franklein S Wein (1996) recommended its use as a medicament of weeping cases⁷.

Natural honey is known to be harmless to the tissue⁸. It is sterile in nature⁹ and has antiseptic¹⁰,

antibacterial¹¹ and hygroscopic properties¹². Relief of pain and soothing effects topical application of honey has also been reported¹³.

According to literature, the solubility reducibility factor is present in honey which remains active in the absence of saliva but will be inactivated by salivary enzymes; give some support to affect of honey on the dentine of root canal¹⁴.

Keeping in view the therapeutic properties of honey, its easy availability and low cost, the present study was undertaken to investigate the antimicrobial potential of honey as an intracanal dressing / medicament in the root canal therapy.

MATERIAL AND METHODS

It was a therapeutic clinical trial of sixty teeth.

All the teeth were single rooted and showed a positive culture. Only the patients with good general health between age group 25-35 years were selected. The patient with severe pain and / or swelling, the patients on anti-inflammatory or antibiotic medication and the uncooperative unwilling patients were excluded.

First visit

All procedures were performed observing standardized sterilization. Initial penetration of the

crown of the tooth was done using a sterile diamond or tungsten carbide in a high speed hand piece and a correct outline was cut into the dentine. Then after applying rubber dam the proper access preparation was done with steel bur in a convention speed hand piece¹⁵.

The necrotic pulp tissue was removed using broaches and files and starting from coronal part of the rest canal. The instruments inserted about 3 or 4mm into the canal, rotated through 90° and withdrawn. This was accompanied by gentle but copious irrigation with distilled water.

A Hedstorm File or a K-File (ISO size 15–25) was introduced and working length was established radiographically¹⁶. The root canal was then cleansed and enlarged to within 1mm of the radiographic apex. Straight canals were enlarged apically with reamers to minimum of ISO 50 and flared. Curved canals were prepared using step-back technique¹⁷. During instrumentation distilled water was used for irrigation of the canal.

The root canal was dried using endodontic absorbent points. The honey dressing was placed and introduced with a sterile paper points impregnated with uncontaminated unprocessed honey from the bee hives. The access was then sealed with temporary filling material¹⁸.

Second visit

On a second appointment, three days later, the teeth were entered again following the same protocol for disinfection. The canals were thoroughly irrigated and dried. The culture was taken to determine the presence or absence of bacteria. Again a honey dressing was given and access cavity was sealed.

Third visit

On seventh day, a third microbiological sample was taken following the same procedure.

Sampling procedure

The initial sample was taken from the un-instrumented root canal. As sterile endodontic absorbent point was inserted to the apex of the root and allowed to remain there for a minute. It was then removed and, if the tip of the absorbent point was moistened with exudates, it is immediately

dropped into a screw capped tube at least 60% full of sodium thioglycolate¹⁹ culture medium. If the absorbent point comes out dry a drop or two of culture medium was carried out to supply the needed moisture²⁰. At the time of reception of the absorbent point the neck of the tube was flamed and the tube was held at an angle of about 45°.

Microbiological examination

The culture tube, properly labeled was incubated for at least forty eight hours before it is examined for growth the turbidity indicates growth of microorganisms. If the culture medium remains clear it indicates sterility¹⁹. For further confirmation a smear was made from the culture media. After grams staining it was examined under the light microscope for any growth.

Post operative pain evaluation

The degree of pain recorded at each observation was given a numerical value.

0 – no pain, 1 – mild pain, 2 – moderate pain and 3 – severe pain.

If the patient did not require an analgesic and reported mild or minimal discomfort that disappeared within 48 hours, this was classified as mild postoperative pain. If the patient reported tolerable discomfort with slight tenderness on palpation of Periapical area that required an analgesic, it was classified as moderate. If the patient reported continuous pain with extreme sensitivity on biting or palpation that required a strong analgesic, the postoperative pain was classified as severe.

RESULTS

The microbiological examination of the initial root canal samples revealed microorganisms in all teeth. At third day bacteria were recovered from twenty six teeth. At the seventh day only twelve teeth gave positive results (Table 1).

Results of the clinical evaluation of post operative pain showed that on 3rd post operative day none experience severe pain, two patients experience a moderate type of pain where as forty

one patients experience mild pain during first 48 hours. On seventh post operative day only six patient gave the history of mild pain the rest were not having any pain (Table 2).

Table 1: Bacteriological test results at different time of sampling

Time of sampling	No.	Negative	Positive
Day 0	60	0	60
Day 3	60	34	26
Day 7	60	48	12

Table 2: Presence and degree of pain experienced by sixty patients throughout the period of the study.

	None	Mild	Moderate	Severe
Day 6	15	17	18	10
Day 3	17	41	2	0
Day 7	54	6	0	0

According to clinical assessment no intra oral or extra oral swelling was noted postoperatively in any case. On third post operative day only two patients (3.33%) were having moderate pain on palpating the apical area. Apical exudation was noted in the 10 (16.66%) case at third post operative day. Only in 2 (3.3%) cases a second honey dressing has failed to eliminate the apical exudation (Table-3).

Table 3: Distribution of teeth according to clinical assessment.

Clinical Parameter	Day 3	Day 7
Percussion sensitivity	18	3
Tenderness on palpation	2	0
Intraoral swelling	0	0
Extraoral swelling	0	0
Apical exudation	10	2

DISCUSSION

The result of the trial indicates that the honey exhibits antibacterial property when used as an intracanal medicament. In addition to its

antibacterial property the honey play a satisfactory role in relieving postoperative pain and also in eliminating the apical exudates. The hygroscopic property is of great importance as no other root canal disinfectant exhibit this property. Although it did not show antibacterial property superior to conventionally used intracanal medicaments, as it is cheap and easily available in rural areas, it can also be the medicament of choice in the subcontinent.

Yared GM and BocDoghar FE experimented sixty single rooted teeth. Half of these teeth were prepared to a size 25 file and other half to a size 40 file. Then the root canals were dressed with CaOH for 1 week. Bacterial sampling showed significant reduction of bacterial growth during the treatment. No statistically significant difference was noted between the size 25 and 40 files groups after instrumentation and after 1 week CaOH dressing. 11 out of 30 teeth (36.6%) yielded detectible growth when canal was prepared till 25 number file. 8 out of thirty cases (26.6%) yielded positive detectable growth in cases the canal was prepared upto 40 number file²². These results are comparable to our findings.

Our findings also corroborate those from Caolos AM Barbsa and his associates. In their clinical experiments, root canals that yielded positive cultures, a week after complete chemomechanical preparation and camphorated paramono chlomono chlorophenole dressing were medicated with one of the three substances tested i.e. calcium hydroxide, chlorhexidine and CPMC. Post medication samples were thus taken from the canal 1 week later. They found persistent infection in 26.7% of the canals medicated with CaOH, 38.8% of the canal medicated with CPMC and 22.2% of the canal medicated with chlorhexidine, yielded positive culture²³.

Incidence of pain of severe nature during and after endodontic treatment was reported by different investigators. Negm MM demonstrated that 7.2% to 9.2% of the patients had experienced severe pain after extirpation, 13.6% to 21% of the patients have experienced severe pain after instrumentation, when no intracanal medication was given²¹.

Regarding pain relieving properties the results of present study supports the finding of L.R.G. Fava. He studied non vital maxillary central

incisor exhibiting acute periodontitis to evaluation and dressing with a calcium hydroxide paste (Group 1) oral corticosteroid antibiotic solution (Group 2). Sixty teeth from 48 patients were prepared and dressed on the first visit and re-evaluation clinically 7 days later. The results of his clinical evaluation showed no difference in pain incidence between the two groups. In the first evaluation (48 hours) only three patients, two in group 1 and one in group 2 reported moderate pain which required the use of analgesics. All others reported none to slight post operative pain. The clinical performed 7 days later also showed no difference between the two groups. The patients who had felt moderate pain at the first evaluation reported no pain at the second evaluation²⁴.

CONCLUSION

The honey exhibit antibacterial property when used as an intracanal medicament. Although it did not show antibacterial property superior to conventionally used intracanal medicaments, as it is cheap and easily available in rural areas, it can also be the medicament of choice in subcontinent.

The results of the trial indicate that the honey has a soothing effect and plays a satisfactory role in relieving post operative pain. The honey also showed good results in eliminating the apical exudates. However, a further study containing a large sample is suggested in order to recommend it in weeping canals.

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