

Clinical Evaluation of Herbal Intracanal Medicaments in Root Canal Preparation: An In Vivo Study

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Abstract: This paper presents a study on clinical evaluation of herbal intracanal medicaments in root canal preparation.

Keywords: herbal, punica granatum, tinospora cordifolia, zingiber officinale.

1. Introduction

A potential role of microorganisms in the initiation and perpetuation of endodontic infections has long been established. A combined chemo-mechanical approach is followed in an attempt to clear off the microorganisms from the pulp space. Endodontic therapy or root canal therapy is a sequence of procedures for treating the infected pulp of a tooth, resulting in the elimination of infection and the protection of the decontaminated tooth from future microbial invasion. Microcomputed tomography images of the canal walls have brought into light the fact that mechanical instrumentation alone is not sufficient enough to touch all areas of the canal wall. The microenvironment of root canal presents excellent conditions to establish microbial growth. The major cause of disease after root canal treatment is the persistence of microorganism in the apical third of the root canal of teeth. This makes the use of irrigation solutions and intracanal medicament mandatory in conjunction with mechanical instrumentation to achieve disinfection and healing. Keeping into account the microbial cause of pulpal and periapical diseases, an ideal irrigation solution should have good antibacterial activity.

The goal of the endodontic treatment is to debride and disrupt the microbial ecosystem associated with the disease process and to neutralize any antigen that may be left in the canal after elimination of the microorganisms. Therefore, the infected root canal is subjected to combined chemo-mechanical treatment involving instrumentation plus copious irrigation with the antimicrobial agents or disinfectants followed by suitable intracanal medicaments.

It is essential to explore new antimicrobial agents that are productive in eradicating the tenacious bacteria in the root canal systems. Therefore, in this study, four herbal agents were

chosen and clinically evaluated.

2. Material and Methods

A. Procedure

Patients came to department with chief complaint of pain were taken into consideration. Patients were divided into 4 groups (5 in each). Local anesthesia was administered with 2% lignocaine (1:80,000 epinephrine). The access opening was done. 10 number stainless steel hand k file was used to establish the glide path. The working length was obtained using apex locator and was confirmed using radio visio graphy. Biomechanical preparation was performed upto size 25 using a stainless-steel hand k file followed by rotary system. During the biomechanical preparation irrigation was done in between the instrumentation.

B. Preparation of Test Solution

1) *Tinospora cordifolia* (giloy)

The stem of Giloy was collected from the courtyard. Plant material were washed with distilled water. The stem was crushed in fresh mortar and pestle. This process was repeated till the enough extract was obtained and mixed with normal saline contains sodium chloride. The extract was stored in room temperature.

2) *Zingiber officinale* (ginger)

Fresh Ginger was taken from the market and washed with distilled water. The peel was removed using fresh knife and cut into small pieces. The pieces were crushed in fresh mortar and pestle. This process is repeated until enough extract was obtained and mixed with normal saline contains sodium chloride. The extract was stored in room temperature.

3) *Punica granatum* (Pomegranate)

Pomogranate fruit was brought from market. Removed the peel of the fruit and separated the pulp from it and washed with distilled water. The pulp was crushed in fresh mortar and pestle. This process was repeated until enough extract was obtained and prepared the medicament by mixing with normal saline

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contains sodium chloride.

Prepared herbal medicament is placed inside the prepared root canal and temporarily seal the canal with cavit. Obturation was done with gutta percha. Post obturation restoration was done. Patient was recalled for post operative evaluation.

3. Results

Pomegranate was best among all the intra canal medicaments followed by giloy and ginger.

4. Discussion

The good prognosis of endodontic treatment over the years, rests on the complete cleaning and disinfection of pulpal space. The main reason for endodontic failure is incomplete cleaning canal system. The intricate root canal structure makes elimination of micro-organisms problematic. Many chemical substances have been suggested in various studies for root canal disinfection. However, due to the adverse effects, toxicity issues, inability to completely remove the smear layer, growing microbial resistance to the routinely used conventional root canal disinfectants and inability to eliminate the microbes such as *Enterococcus faecalis* which flourish in periapical abscesses and granulomas, causing catastrophe of the endodontic treatment lead to development of alternative modalities. Many herbal products with biological and antimicrobial properties have been studied and recommended for root canal disinfection. The major advantages of using herbal extracts as alternative antimicrobial agents for root canal disinfection are ease of availability of these extracts, cost efficiency, augmented shelf life, low toxicity, and absence of microbial resistance.

Tinospora cordifolia (*Guduchi*) has been reported to contain temoporfin, coloumbin, and tinosporic acid. It is well known in ayurvedic literature to treat various ailments such as fever, inflammation, skin infection, and urinary infections.

Ginger (*Zingiber officinale*) Ginger is known to have anti-inflammatory, analgesic, antipyretic, antimicrobial, and hypoglycemic properties. Ginger exhibited the highest antibacterial efficacy against *E. faecalis* compared with chlorhexidine and garlic extract.

Pomegranate (*punica granatum*) belonging to the family

punicaceae, is a small tree or shrub. It contains phenolic compounds, including flavonoids and hydrolysable tannins. *Punica granatum* peel has free radical-scavenging properties. Besides accounting for majority of its antioxidant activity, these compounds also exhibit antifungal, antibacterial and antiproliferative properties.

Swapna munaga et al., in 2022 concluded that herbal agents can be effectively used for canal disinfection. However, long-term, invitro, clinical, biocompatibility studies clinical trials are further needed to confidently use these products in endodontics. Herbal extracts can be used as substitute to existing root canal disinfectants due to their unique properties. Therefore, improving the endodontic success rate by preventing root canal failures, persistent and reinfections.

Akanksha Mittal et al., in 2021 concluded that Calcium hydroxide showed the maximum antibacterial activity followed by Pomegranate gel with no statistically significant difference between them. However, pomegranate gel showed statistically significant antibacterial activity when compared to Neem and Tulsi. Calcium hydroxide showed the best antibacterial activity against *E. faecalis*. Among herbal gels, pomegranate showed the maximum antibacterial activity, however, further in-vivo research is required for it to be used as a sole intracanal medicament clinically.

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