

HERBS IN ROOT CANAL IRRIGATION – A REVIEW.

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ABSTRACT:

AIM: The aim of this article is to review about the role of herbs in root canal irrigation.

BACKGROUND: Irrigation plays the main role in eradication of microbes from the root canal system. To effectively clean and disinfect the root canal system an effective irrigant should be used. An irrigant should be able to disinfect and penetrate dentin and its tubules, offer long-term antibacterial effect (substantivity), remove the smear layer, and nontoxic. A wide variety of synthetic drugs are available today but due to the ineffectiveness, safety concerns and side effects of these synthetic drugs, the herbal alternatives for endodontic irrigants might be advantageous. Herbal irrigants are popular mainly due to their easy availability, cost effectiveness, increased shelf life and low toxicity. This review aims at providing an overview of the various endodontic irrigants.

REASON: To know about the various advantages and disadvantages of herbal endodontic irrigants.

INTRODUCTION:

The major objective of root canal treatment is to disinfect the root canal system and eliminate the recontamination. Irrigation is done to reduce the number of bacteria in the root canals and prevent the recurrence of any periapical disease. For this purpose, a wide variety of synthetic drugs are available today. The most commonly used synthetic irrigants are sodium hypochlorite, EDTA, chlorhexidine. Each of these irrigants have side effects.

Sodium hypochlorite is one of the most commonly used endodontic irrigant because of its ability to destroy microbes. But it has some undesirable characteristics such as tissue toxicity, allergic potential, disagreeable taste and inability to remove the smear layer [1]. Ethylenediaminetetraacetic acid (EDTA) is also used to irrigate the canal, which effectively demineralises the smear layer [2] but has to be used along with NaOCl to remove the organic part [3] and does not have good disinfective ability. [4] Chlorhexidine is another commonly used antimicrobial agent which is being used to irrigate the canals due to its wide spectrum antimicrobial activity, biocompatibility, ability to disinfect the infected root canals. However it does not have tissue dissolving capabilities [5] and also has some undesirable effects as it may discolour the teeth, [6] may lead to dryness of the oral cavity and may even cause burning sensation of the mouth.

Due to the ineffectiveness, safety concerns and side effects of these synthetic drugs, the herbal alternatives for endodontic irrigants will be advantageous. Thus this review aims at providing a comprehensive overview of the various herbal endodontic irrigants and their efficacy in carrying out root canal irrigation.

HERBAL PRODUCTS:

Curcuma longa:

Curcumin is a member of ginger family (Zingiberaceae). Turmeric is used extensively in medicine as an anti-inflammatory [7] and for the treatment of flatulence, jaundice, menstrual difficulties, hematuria, hemorrhage, and colic [8].

Prasanna Neelakantan et al conducted an *in vitro* study to evaluate the antimicrobial efficacy of turmeric against *E. faecalis* considering Sodium hypochlorite (3%) as reference for comparison. The result of his study revealed that curcumin had significant antibacterial activity against *E. faecalis*. He concluded that the antibacterial activity of curcumin is similar to sodium hypochlorite and thus herbal medicine can be used in endodontics for root canal failure. [9]

TEA TREE OIL:

This is a native Australian plant with terpenin- 4-ol as its major component, responsible for the antibacterial and anti fungal properties. It is used as root canal irrigant, but it is less effective compared to EDTA and NaOCl (10).

SALVADORA PERSICA (Miswak):

In a study conducted by Nawal A.K.Al- Sabawi et al, the alcoholic extract of *Salvadora Persica* was compared with 5.25% sodium hypochlorite, 0.2% Chlorhexidine and normal saline. It was shown that *Salvadora Persica* extract had significant antimicrobial effect against both aerobic and anaerobic bacteria with its efficacy being maximum at the percentage of 15 [11].

NEEM EXTRACT :

Neem's anti viral [12], anti fungal [13], anti bacterial [15] and anti carcinogenic activity [14] makes it a suitable agent for root canal irrigation. Neem leaf extract is used to treat dental plaque and gingivitis. Being a bio-compatible anti oxidant, use of neem is advantageous as it is not likely to cause the severe harms to patients that might occur due to the usage of sodium hypochlorite. Naiyak Arathi et al observed that the ethanolic extract of neem had significant anti microbial activity against *E. faecalis*. [16] In another study by Hannah Rosaline et al, the effects of herbal extracts such as *Morinda Citrifolia*, *Aadirachta indica* and green tea were studied. Neem is an effective herbal alternative to the most commonly used irrigant sodium hypochlorite. [17]

GREEN TEA:

Triphala's fruit and green tea is rich in citric acid which will help in removing the smear layer. It's chelating property makes it an effective alternative to sodium hypochlorite for the purpose of root canal irrigation. [18] It has significant anti oxidant, anti cariogenic, anti inflammatory, thermogenic, probiotic and anti microbial properties. [19] In a study conducted by J.Prabhakar et al, Green tea polyphenols were found to have significant anti microbial activity against *E. faecalis* biofilm formed in tooth substrate. [6] In another study by Madhu Pujar et al, antimicrobial efficiency of green tea polyphenols and 3% sodium hypochlorite were compared against *E. faecalis* and it was observed that the green tea polyphenols showed significantly better antibacterial activity against 2 week biofilm. [20]

CONCLUSION:

Literature has addressed that many plants with potential source for newer therapies in endodontics. The studies listed above have shown important medicinal activities of plants, with great demand to inhibit or suppress the growth and activity of bacteria and their biofilm. The major advantages of herbal irrigants are safety, easy availability, increased shelf life, cost effectiveness and lack of microbial resistance. The in vitro studies conducted so far have shown that herbs can have a potential role as root canal irrigants.

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