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HERBAL IRRIGANTS – FUTURE TRENDS

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Abstract:

Irrigants play a main role in disinfecting the root canal system by reducing the bacterial load in root canals. In endodontics because of the cytotoxic reactions of irrigants used and their inability to eliminate bacteria from dentinal tubules, trend of recent medicine attends to use biologic medication extract from natural plants. Herbal alternatives are popular mainly due to their easy availability, cost effectiveness, increased shelf and low toxicity. This paper reviews the role of various herbal products in endodontics.

Keywords: Herbal, Irrigants, endodontics, toxicity, root canal.

Introduction:

The main aim of an endodontic treatment is to remove diseased tissue, to eliminate bacteria from the root canal system and to prevent its recontamination (1). Irrigating solutions are very important during root canal preparation because they aid in the cleaning of root canal, lubricate the files, flush out debris, have anti microbial effect, provide tissue dissolution without damage to the periapical tissues (2).

IDEAL REQUIREMENT OF ROOT CANAL IRRIGANT

- Broad anti microbial spectrum.
- High efficacy against anaerobic and aerobic and facultative microorganisms organized in biofilm.
- Ability to dissolve necrotic pulp tissue remnants
- Ability to inactivate endotoxins
- ability to prevent the formation of a smear layer during instrumentation or to dissolve the larger one once it has formed.

- Systemically nontoxic when they come in contact with vital tissues, non caustic to periodontal tissues, and with little potential to cause anaphylactic reactions (3).

Classification

Herbs commonly used in dentistry are:

Anti microbial - matricauachamoite, salvadoraPersica, azatdirchtaindica

Anti inflammatory- propoliscrevalo

Sedative and - Malisiaofficinalis, passiflora incarnate, piper meythistam

Herbs Used In Irrigants

Triphala ,propolis, azardirecta indica, green tea, salvadoraPersica, tea tree oil, garlic, lemon solution, turmeric, psoralae , corylifidia (5).

Triphala

Triphala is a type of indianAyurvedic product consists of dried and powdered fruits of plants like TerminaliaBellerica, TerminaliaChebula and EmblicaOfficinalisIt is rich in citric acid, which helps in removal of smear layer by acting as a cheating agent and also act as alternative for sodium hypochlorite (6). It has anti inflammatory, antioxidant, anticariogenic, thermogenic and probiotic (7). Triphala achieved 100% killing of E. Faecalis at 6 min and also has major advantages like easy availability, cost effectiveness, longer shelf life, low toxicity and lack of microbial resistance (8). Triphala can also act as an alternative to NaOCl for endodontic infections (9). It also has an anti scavenging property (10).

Propolis

Propolis is a brownish resinous material because Honeybees collect from various plant species and mix with wax and other substances. Some scientific research proved that it has antioxidant, antibacterial, anti fungal, antiviral, anti inflammatory, anti tumour and immunomodulating properties (11). The flavonoids and cinnamic acid derivatives is considered as biologically active components so that it exhibits several pharmacological properties such as anti microbial, anti inflammatory, healing, anesthetic and cytostatic and cariostatic properties (12) The anti inflammatory role in propolis is played by cafferic acid and phenethylester(CAPE). The ethanol plays a role in bone regeneration and inducing hard tissue bridge formation in pulpotomies or pulp capping (13).It can be used as an alternative for intracanal medicament (14).

Turmeric (Curcuma Longa)

Curcumin is the principle curcuminoid of popular indian spice turmeric, which is a part of ginger family (zingiberaceae). Turmeric plays an anti inflammatory property and for the treatment of relieving pain and

inflammation (15). It also has the anti microbial and anti cancer activity (16,17) In an article it is proved that it has significant antibacterial activity against E.faecalis and also used as alternative for root canal irrigation and also in root canal failure cases (18)

Green Tea Polyphenols

Green tea which is considered as a traditional drink of Japan and China is prepared from tea plant *Camellia sinensis*. It contains flavanols or catechins have antioxidant, anticarcinogenic, anti inflammatory and thermogenic, probiotic and anti microbial properties. Tea contains natural fluoride, helps in preventing dental caries (19). Epigallocatechin-3 gallate protect the bone and prevents periodontal diseases. GTP has antibacterial activity(9)

Garlic

Garlic also known as *Alium sativum* has been used for medicinal purpose. Plants bulb is mostly commonly used. It is an anti diabetic agent. Garlic contains allicin which destroys the cell membrane of root canal bacteria which is used as an alternative irrigant for NaOCl. It inhibits the growth of oral pathogens like streptococcus mutants and porphyromonsgingivalis used for management of dental infections like periodontitis (6)

Tea Tree Oil (Melaleuca alternifolia)

Tea tree oil, a native Australian plant with many properties like antiseptic, an anti fungal and mid solvent has an active component of terpinen-4-ol have efficacy of removing smear layer superior to NaOCl but less than EDTA(1).

Neem (Azadirachta indica)

Neem oil bark and leaf extracts has effective agent against E.faecalis and *Candida albicans* which has antioxidant and anti microbial properties for root canal irrigation as an alternative to sodium hypochlorite (20)

Passion Fruit

Passion fruit acts as biocompatible antioxidant and it has better taste and aroma which gives the fruit an advantage over other herbal irrigants(21). It does not have the tissue dissolving capacity(22). Passion fruit pulp extract can be used along with sodium hypochlorite which does not have any harmful effect like chlorhexidine. It also has the property of removing smear layer on teeth, which is an ideal property of root canal irrigant (23)

Marticaria Recutitia Linn (German channolie)

It has an anti-inflammatory, analgesic, anti microbial, antispasmodic and sedative properties. It disinfects root canal system with less toxicity when used as irrigants (24).

Salvodara Persica

SalvodaraPersica can be used as root canal irrigants because of its anti microbial effect aerobic and anerobic bacteria recovered from teeth with necrotic pulps (34). It is also known as miswak. The 10% water extract of SalvodoraPersica could be as an effective antibacterial and anti microbial agent which can be used as an endodontic irrigant for teeth with necrotic pulps (25).

Morinda Citrifolia

Morindacitrifolia known as NONI, also known as indian mulberry. It juices has therapeutic effects including antibacterial ,antiinflammatory ,antiviral, analgesic, hypotesive effects. The use of morindacitrifolia as a endodontic irrigant as a part of dental treatment has biocompatible antioxidant and not likely to cause severe injuries like NaOCl accidents. It acts against E. Faecalis in dentin. So it acts as an alternative intracanal irrigant (26).

Conclusion

The major advantages of using herbal alternative are easy availability, cost effectiveness, increased shelf life, less toxicity and lack of microbial resistance against E.faecalis that commonly cause root canal failure during endodontic procedure and so herbal irrigants can be used as an alternative during root canal treatment.

References

1. Calt S, Serper A, Time dependent effects of EDTA on dentine structures, journal of endodontics, 28 (1), 2002, 459–461.
2. Mohammed Torabinajad, ShahrokhShabahang,RayDalfo,M.Aprecio,andJames.D.-Anti microbial effect of MTAD an in vitro investigation-j endod-2003;29:6- 400-3.
3. Zehnder M. Root Canal Irrigants. J Endod 2006;32:389-98.
4. Groppo FC, Bergamaschi CC, Cogo K, France –Montan M, Motta RHL, de Andrade ED. Use of Phytotherapy in Dentistry. Phytother. Res.2008: 22: 993-998.
5. International journal of dental sciences and oral rehabilitation, oct-dec 2012.
6. PrasannaNeelakantan, NithyaJagannathan, NabeelNazarEthnopharmacological approach in Endodontic Treatment: A Focused Review. Int. J. Drug Dev. & Res., Oct-Dec 2011, 3 (4): 68-77
7. J.Prabhakar, M.Senthikumar, M.S.Priya [et.al.](#) Evaluation of Antimicrobial Efficacy of Herbal Alternatives (Triphala and Green Tea Polyphenols), MTAD, and 5% Sodium Hypochlorite against

Enterococcus faecalis Biofilm Formed on Tooth Substrate: An In Vitro Study. *J Endod* 2010;36:83-86.

8. Zehnder M, Kosicki D, Luder H, Sener B, Waltimo T. Tissue-dissolving capacity and antibacterial effect of buffered and unbuffered hypochlorite solutions. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2002;94:756 – 62.
9. Murray PE, Farber RM, Namerow KN, Kuttler S, Garcia-Godoy F. Evaluation of *Morinda citrifolia* as an endodontic irrigant. *J Endod* 2008;34:66-70.
10. Jagetia GC, Baliga MS, Malagi KJ, et al. The evaluation of the radioprotective effect of Triphala [an Ayurvedic rejuvenating drug] in the mice exposed to radiation. *Phytomedicine* 2002;9:99–108.
11. Hu F, Hepburn HR, Li Y, Chen M, Radloff SE, Daya S. Effects of ethanol and water extracts of propolis [bee glue] on acute inflammatory animal models. *J Ethnopharmacol* 2005; 100: 276-283
12. Scheller S, Ilewicz M, Luciack M, Skrobidurska D, Matuga W. Biological properties and clinical application of propolis. *Arzneimittelforschung/Drug Res* 1978;28:289-291
13. Bohora A, Hegde V, Kokate S . Comparison of antibacterial efficacy of neem leaf extract and 2% sodium hypochlorite against *E. faecalis*, *C. albicans* and mixed culture- an in vitro study. *Endodontology* 2010; 22: 8-1
14. Oncag O, Cogulu D, Uzel A, Sorkun K (2008). Efficacy of propolis as an intracanal medicament against *Enterococcus faecalis*. *General Dentistry*. 54(5):319-322.
15. Leung A. *Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics*. New York, NY: John Wiley; 1980:313-314.
16. Mortellini R, Foresti R, Bassi R, Green CJ, Curcumin, an antioxidant and anti-inflammatory agent, induces heme oxygenase-1 and protects endothelial cells against oxidative stress., *Free Radic Biol Med*, 28, 2000, 1303-1312.
17. Apisariyakul A, Vanittanakom N, Buddhasukh D, Antifungal activity of turmeric oil extracted from *Curcuma longa* (Zingiberaceae), *J Ethnopharmacol*, 49, 1995, 163-169.

18. Prasannaneelakantan, Chandanasubbarao, Chandragirivenkatasubbarao, analysis of antibacterial activity of curcumin against enterococcus faecalis, International journal of current research and review, 9, 2011.
19. Pulok K. Mukherjee, Sujay Rai, Sauvik Bhattacharyya [et.al.](#) Clinical study of 'Triphala'- A Well Known Phytomedicine from India. IJPT 2006; 5:51-4
20. Subapriya R and S. Nagini, medicinal properties of neem leaves: a review. Curr Med Chem and Anticancer agent 2005;5;146-149.
21. Gernhardt CR, Eppendorf K, Kozlowski A, et al, Toxicity of concentrated sodium hypochlorite used as an endodontic irrigant. IntEndod Journal 2004; 37: 272-280
22. Krishnamurthy S, Sudhakaran S: Evaluation and Prevention of the Precipitate Formed on Interaction between Sodium Hypochlorite and Chlorhexidine. Journal of Endodontics 2010; 36:1154-1157.
23. Bohora A, Hegde V, Kokate S: Comparison of the antibacterial efficiency of neem leaf extract and 2% sodium hypochlorite against E. faecalis, C. albicans and mixed culture - An in vitro study of Endodontology 2010;22:8-12.
24. Lahijani MS, Kateb HR, Heady R. The effect of German chamomile (Matricaria recutita L.) extract and tea tree (Melaleuca alternifolia L.) oil used as irrigants on removal of smear layer: a scanning electron microscopy study. IntEndod J 2006;39:190-95.
25. Almas K. The antimicrobial effects of extracts of Azadirachta indica (Neem) and Salvadoria persica (Arak) chewing sticks. Indian J Dent Res 1999;10:23-6.
26. Flaviana Bombarda de Andrade Ferreira, Sergio Aparecido Torres, Odila Pereira da Silva Rosa [et.al.](#) Antimicrobial effect of propolis and other substances against selected endodontic pathogens. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2007; 104:709-16.

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