ORIGINAL RESEARCH PAPER

Volume-8 | Issue-3 | March-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

LOCALLY DELIVERED HERBS FOR TREATMENT OF DENTAL AND PERIODONTAL DISEASES– A REVIEW

Dental Science

Dr Pooja Palwankar* Professor And Head, Department of Periodontology, Manav rachna Dental College, Faridabad, India *Corresponding Author

Dr Karunik Gupta Postgraduate Student, Manav rachna Dental College, Faridabad, India.

Dr Drishti Palwankar Intern Maulana Azad Institute of Dental Sciences, New Delhi, India

ABSTRACT

The Herbal remedies for the management of diseases related to periodontium are used as local delivery agents.The aim of this article is to present an overview of the current Herbal, Ayurvedic formulations used in day to day practice in management of pain, treatment of gingivitis and related conditions of the oral cavity.

KEYWORDS

INTRODUCTION

Antimicrobial agents are of great interest and may be valuable as adjuncts to mechanical therapy in treating Periodontitis.Systemic administration of antimicrobial drugs involves a relatively high dose with repeated intake over a prolonged period of time to achieve the required inhibitory concentrations in the sulcular fluid, which thus increases the chances of developing resistance to antibiotics. Local administration as an alternate provides a useful answer to these problems.Potential risks associated with systemically administered antibiotics include development of resistant bacterial strains, emergence of opportunistic infections, and possible allergic sensitization of patients. Local administration as an alternate provides a useful answer to these problems. Dr. Max Good sonet al(1979)[17] proposed the concept of controlled delivery in the treatment of periodontitis.Allopathic medications were successfully used as local drug delivery agents but, due to undesirable side effects such as tooth staining, taste alteration, and cost, the use of natural formulations in the form of herbal or Ayurvedic have gained popularity[37].

There are quite a few numbers of herbs that have been proved as an antioxidant which eliminates/ minimises dental and periodontaldiseases.

Aloe vera (Aloe Barbadensis)-Aloe vera is a cactus plant that belongs to the Liliaceae family. Aloe Vera reduces bleeding and gingivitis. It has antiseptic properties and its antifungal property helps in curing denture stomatitis, apthous ulcers, cracked and split corners of the mouth[10,11,16,38]

Oak (Quercus Brantii)-Oak is a species from Fagacea family used for the treatment of gastric ulcers, superficial injuries and local inflammation with haemostatic, anti-bacterial, anti- inflammatory, antinociceptive and anti-oxidant effects[25]

Coriander (Coriandrum sativum)-C.Sativumis from the Umbelliferae family was used in Iranian folk medicine as a carminative and spasmolytic agent. It has anti- inflammatory, analgesic, anti-bacterial and anti-oxidant activities[4,8,25,45]

Green Tea (Camellia sinensis)-It has antioxidant, anti-collagenase, anti-inflammatory, anticaries, antifungal, antiviral and antibacterial effects[3,13,22,26,27,29,33,34]

Turmeric (Curcuma longa)-Turmeric is a rhizome of Curcuma longa is used as an antiplaque mouthwash[9,12].

Bakul(Minusopselengi)- Bakul has cryogenic glycosides in addition to several enzymes suchas oxidases, peroxidasess and pectinases that have shown to inhibit antimicrobial properties[32].

Pomegranate (Punica granatum)-Pomegranate has active compounds containing polyphenolic flavonoids (eg Punicalagins and ellagic acid), are believed to prevent gingivitis[7,30,39]

Neem (AzadirachtaIndica):-It belongs to Meliacae family and widely distributed in Asia and Africa. Almost every part of the plant was used in indigenous systems, particularly against disease of bacterial and fungal origin[2,11,43]

Peppermint (Menthapiperita)-It grows in moist areas with dark green, lance-shaped leaves and purple flowers. Peppermint oil is used for curing toothache Soaked cotton ball in the peppermint oil and placing in cavity helps to relieve pain[28]

Lemongrass (Cymbopogoncitratus)-It is a popular medicinal plant. This plant is commonly used in teas, cosmetics, and folk medicine for its antiseptic, antiemetic, antirheumatic, analgesic, antispasmodic, and antipyretic properties[44]

Tulsi (Ocimum Sanctum)-It is widely used grown, sacred plant of India and belongs to labiateae family**.** It has long history of use in ayurvedic system of medicine to treat various ailments. It is studied that 2% tulsi was effective in the treatment of experimental periodontitis[18,32]

Meswak (Salvadorapersica)-The most common type of chewing stick, Meswak, is derived from Arak tree. Used as dentifrices in the recent years as antiplaque and antigingivitis agent[19]

Myrrh (Commiphoramyrrha)-It is obtained in the form from the trees and shrubs. Myrrh is documented to promote healing in cases of pyorrhea[14,42]

Tea tree oil (Melaleuca alternifolia)-The local delivery of tea tree oil (TTO) gel can be used in case of chronic periodontitis which have proved some beneficial effects to augment the results of the conventional periodontal therapy[14,15,41]

Triphala-It has a free radical scavenging property and the antimicrobial activity[1,5,37]

Clove (Syzgiumaromaticum)-The germicidal and anaesthetizing properties of the oil make it very effective for relieving toothache, sore gums and mouth ulcers[24]

Cinnamon (Cinnamomum verum)-*Streptococcus mutans*, the etiological agents of dental caries, are highly sensitive to Cinnamon therefore ensuring it as antiseptic toothpaste, mouthwash or chewing gum for prevention of dental caries and other oral infections[36]

Garlic (Allium sativum)-Garlic concentrate is has been used as antibacterial agent for root canal lavage[21,23]

Eucalyptus (Globuluslabill)-Eucalyptus oil exhibits antibacterial activity against cariogenic (tooth decay-causing) and periodontopathic

bacteria, is beneficial against some microorganisms such as *Vibrio cholerae, Aspergillus flavus and S.aureus*[20].

Licorice Root (Glycyrrhizaglabra)-Licorice root is used as digestive stimulant and also soothing expectorant for lung disease. It is used in various allergies or as an anti-inflammatory agent[31].

Chamomile (Matricariarecutita)-It belongs to Asteraceae family. It has anti-inflammatory activities[7,24].

For several decades, numerous studies have beenconducted in order to elucidate the chemical and pharmaceutical characteristics of many herbs.

Cao et al. (1998) reviewed articles published on theeffects and mechanisms of herbal medicine on periodontaldisease. Particularly, two modifications of an ancientcompound prescription, Guchiwan (Tooth-firming pills) andGuchigao (Tooth-firming extract), were serially studied. It was pointed out in the review that various herbal extracts hadshown suppressive effects on bone resorption by isolated osteoclasts in vitrostudies[11].

Sastravahal G et al (2005) conducted a study to evaluate the efficacy of the combined herbal preparation in comparison to standard supportive periodontal therapy (SPT), with additional monitoring of certain inflammatory markers. Fifteen patients in the recall programme who had completed conventional periodontal therapy with remaining probing pocket depths of 5-8 mm were enrolled. They concluded that adjunctive local delivery of extracts ofC.asiaticainwith P.granatum significantly improved clinical signs of chronic periodontitis and IL-1 level in maintenance patients[39].

Bansal S et al (2012) reviewed mechanical, chemical and herbal aspects of periodontal disease control. They concluded that despite of several agents being commercially available, that could alter oral microbiota and with side-effects such as vomiting, diarrhoea, tooth staining, and bacterial resistance to antibiotics, used to treat oral infections. Hence natural phytochemicals isolated from plants used in traditional medicine are considered as good alternatives to synthetic chemicals[6].

Phogat M et al (2014) evaluated the efficacy of a xanthan-based chlorhexidine gel versus herbal extracts gel as an adjunct to periodontal therapy in the treatment of chronic periodontitis. They concluded that the local application of herbal gel is comparable to chlorhexidine gel in the treatment of chronic periodontitis as an adjunct to mechanical periodontal therapy[35].

CONCLUSION- The delivery of safe and efficient Herbal and Ayurvedic medicine intoperiodontal pockets through local delivery system has reduced the side effects of allopathic medicine system through limited use of antibiotics. With the introduction of Herbal and Ayurvedic medicine system, avenues for research have opened for their use in treatment of periodontaldiseases. Development of novel drug delivery systems for treatment of dental and periodontal diseasesis likely to be one of the thrust areas of research in future. Thus it can be concluded that variousAyurvedic and herbal byproducts as an adjunct to scaling and root planing has beneficial effect on periodontal diseases.

REFERENCES

1. Abraham S, Kumar MS, Sehgal PK, Nitish S, Jayakumar ND.(2005)Evaluation of the inhibitory effect of triphala on PMN-type matrix metalloproteinase (MMP-9). J Periodontol,76(4),497-502.
2. Antony VV. Evaluation of the efficacy of azadirachtaindica (neem) extract gel as a local drug delivery in the treatment of patients with chronic periodontitis-A Double Blind Randomised Clinical Study.(2013) IOSR J Pharma,3(4),15-21.
3. Araghizadeh A, Kohanteb J, Fani MM. Inhibitory activity of green tea (Camellia sinensis) extract on some clinically isolated cariogenic and periodontopathic bacteria.(2013) Med Princ and Pract,22(4),368-72.
4. Aslani A, Ghannadi A, Najafi H. Design, formulation and evaluation of a mucoadhesive gel from Quercusbrantii L. and coriandrumsativum L. as periodontal drug delivery.(2013) Adv Biomed Res,2,21
5. Bajaj N, Tandon S. The effect of Triphala and Chlorhexidine mouthwash on dental plaque, gingival inflammation, and microbial growth.(2011) Int J Ayurveda Res,2(1),29-36
6. Bansal S, Rastogi S, Bajpai M. Mechanical, Chemical and Herbal aspects of Periodontitis: a Review.(2012) Int J PharmacSci Res,3(5),1260-67
7. Batista AL, Lins RD, de Souza Coelho R, do Nascimento Barbosa D, Belém NM, Alves Celestino FJ.(2014)Clinical efficacy analysis of the mouth rinsing with pomegranate and chamomile plant extracts in the gingival bleeding reduction. Complement Ther Clinical Pract,20(1),93-8.
8. Begnami AF, Duarte MC, Furletti V, Rehder VL. Antimicrobial potential of Coriandrumsativum L. against different Candida species in vitro.(2010) Food chemistry,118(1),74-7.
9. Behal R, Mali AM, Gilda SS, Paradkar AR. Evaluation of local drug-delivery system containing 2% whole turmeric gel used as an adjunct to scaling and root planing in chronic periodontitis: A clinical and microbiological study.(2011)J Indian Soc Periodontol,15(1),35-8
10. Bhat G, Kudva P, Dodwad V. Aloe vera: Nature's soothing healer to periodontal disease(2011) J Indian Soc Periodontol,15(3),205-9
11. Cao CF, Sun XP.(1998) Herbal medicine for periodontal diseases.Int.Dent.J,48(3),316-22.
12. Chaturvedi TP.(2009)Uses of turmeric in dentistry: An update. Indian J. Dent.Res,20(1)107-9
13. Chava VK, Vedula BD.(2013) Thermo-reversible green tea catechin gel for local application in chronic periodontitis: a 4-week clinical trial. J Periodontol,84(9),1290-6.
14. Elena CM, Rogelio OP, Manuel GL Effectiveness of Melaleuca alternifolia (tea tree) and Commiphoramyrrha (myrrh), as irrigants in non-surgical periodontal therapy.(2014) Tame ,3(8),258-263
15. Elgendy EA, Ali SA, Zineldeen DH. Effect of local application of tea tree (Melaleuca alternifolia) oil gel on long pentraxin level used as an adjunctive treatment of chronic periodontitis.(2013) A randomized controlled clinical study. J Indian Soc Periodontol,17(4),444-8
16. George D, Bhat SS, Antony B.(2009) Comparative evaluation of the antimicrobial efficacy of Aloe vera tooth gel and two popular commercial toothpastes: An in vitro study.Gen Dent,57(3),238-41.
17. Goodson JM,Offenbacher S, Farr DH, Hogan PE.(1985) Periodontal Disease Treatment by Local Drug Delivery.J. Periodontol,56(5),265-27
18. Gupta D, Bhaskar DJ, Gupta RK, Karim B, Jain A, Singh R, Karim W.(2014) A randomized controlled clinical trial of Ocimum sanctum and chlorhexidine mouthwash on dental plaque and gingival inflammation. J.Ayurveda Integr.Med,5(2),109-116
19. Halawany HS. A review on miswak (Salvadorapersica) and its effect on various aspects of oral health.(2012)Saudi Dent Journal,24(2),63-9.
20. Harkat-Madouri L, Asma B, Madani K, BeyOuld Si Said Z, Rigou P, Grenier D. Chemical composition, antibacterial and antioxidant activities of essential oil of Eucalyptus globulus from Algeria.(2015)Ind Crops Prod,78,148-53.
21. Houshmand B, Mahjour F, Dianat O.(2013)Antibacterial effect of different concentrations of garlic (Allium sativum) extract on dental plaque bacteria. Indian J Dent Res,24(1),71-5.
22. Hirasawa M, Takada K, Makimura M, Otake S.(2002) Improvement of periodontal status by green tea catechin using a local delivery system: a clinical pilot study. J Periodont Res,37(6),433-8.
23. Jang JH, Park YD, Ryu DY.(2012) The effect of garlic extract on antibacterial activity of periopathogens. J Korean SocDent Hyg,12,631-40.
24. Jayashankar S, Panagoda GJ, Amaratunga EA, Perera K, Rajapakse PS.(2011) A randomised double-blind placebo-controlled study on the effects of a herbal toothpaste on gingival bleeding, oral hygiene and microbial variables. Ceylon Med J,56(1),5-9
25. Kaur A, Kapoor D, Soni N, Gill S. Phytodentistry–A Boon???.(2016)Arch of Med and Dent Res,2(4),25-31
26. Kudva P, Tabasum ST, Shekhawat NK. Effect of green tea catechin, a local drug delivery system as an adjunct to scaling and root planing in chronic periodontitis patients: A clinicomicrobiological study.(2011) J Indian Soc Periodontol,15(1),39-45
27. Kushiyama M, Shimazaki Y, Murakami M, Yamashita Y. Relationship between intake of green tea and periodontal disease.(2009) J Periodontol,80(3),372-7.
28. Mahboubi M, Kazempour N. Chemical composition and antimicrobial activity of peppermint (Menthapiperita L.) Essential oil.(2014)Songklanakarin J. Sci. Technol,36(1),83-7.
29. Maruyama T, Tomofuji T, Endo Y, Irie K, Azuma T, Ekuni D. Supplementation of green tea catechins in dentifrices suppresses gingival oxidative stress and periodontal inflammation.(2011) Arch Oral Biology,56(1),48-53.
30. Menezes SM, Cordeiro LN, Viana GS. Punicagranatum (pomegranate) extract is active against dental plaque(2006). J.Herb Pharmacother,6(2),79-92.
31. Messier C, Epifano F, Genovese S, Grenier D. Licorice and its potential beneficial effects in common oro-dental diseases.(2012) Oral Dis18(1),32-9.
32. Mistry KS, Sanghvi Z, Parmar G, Shah S. The antimicrobial activity of Azadirachtaindica, Mimusopselengi, Tinosporacardifolia, Ocimum sanctum and 2% chlorhexidine gluconate on common endodontic pathogens: An in vitro study.(2014) Eur.J Dent,8(2),172-7
33. Mitscher LA, Jung M, Shankel D, Dou JH, Steele L, Pillai SP. Chemoprotection: a review of the potential therapeutic antioxidant properties of green tea (Camellia sinensis) and certain of its constituents.(1997) Med.Res.Rev,17(4),327-65.
34. Palwankar P, Gopal L, Verma A.Effect of Green Tea Catechin Gel on Crevicular Glutathione Levels in Chronic Periodontitis - A Clinico-Biochemical Study.(2018)Int. J Scient. Res.,7(8),14-18.
35. Phogat M, Rana T, Prasad N, Baiju CS. Comparative evaluation of subgingivally delivered xanthan-based chlorhexidine gel and herbal extract gel in the treatment of chronic periodontitis.(2014)J Indian Soc Periodontol,18(2),172-177
36. Quale JM, Landman D, Zaman MM, Bumey S, Sathe SS. In vitro activity of Cinnamomumzeylanicum against azole resistant and sensitive Candida species and a pilot study of cinnamon for oral candidiasis.(1996) Am J Chin Med,24(02),103-9.
37. Rangrej U, Dave D, Rai J, Vaghani K.(2017) Evidence Based Review on Herbal Local Drug Delivery.IOSR J Dent Med Sci,16(8),77-85.
38. Rathod S, Mehta P, Sarda T, Raj A. Clinical efficacy of aloe vera chip as an adjunct to non surgicaltherapy in the treatment of chronic periodontitis.(2015)Int. J. Res. Ayurveda Pharm.6(4),516-19.
39. Sastravaha G, Gassmann G, Sangtherapitikul P, Grimm WD. Adjunctive periodontal treatment with Centellaasiatica and Punicagranatum extracts in supportive periodontal therapy.(2005)J IntAcad Periodonto,l7(3),70-9.
40. Sharma K. Skin Permeation of Candesartan Cilexetil from Transdermal Patch Containing Aloe Vera Gel as Penetration Enhancer.(2016) Asian J Pharma,24;10(2), 124-131.
41. Soukoulis S, Hirsch R. The effects of a tea tree oil-containing gel on plaque and chronic gingivitis.(2004) Aust Dent J,49(2),78-83.
42. Tipton DA, Lyle B, Babich H, DabbousMKh. In vitro cytotoxic and anti-inflammatory effects of myrrh oil on human gingival fibroblasts and epithelial cells.(2003) Toxicol. In Vitro, 17(3),301-10.
43. Vennila K, Elanchezhiyan S, Ilavarasu S. Efficacy of 10% whole Azadirachtaindica (neem) chip as an adjunct to scaling and root planning in chronic periodontitis: A clinical and microbiological study.(2016) Indian J Dent Res,27(1),15-21
44. Warad SB, Kolar SS, Kalburgi V, Kalburgi NB. Lemongrass essential oil gel as a local drug delivery agent for the treatment of periodontitis.(2013) Ani.Sci.Life,32(4),205-11.
45. Yaghini J, Shahabooei M, Aslani A, Zadeh MR, Kiani S, Naghsh N. Efficacy of a local-drug delivery gel containing extracts of Quercusbrantii and Coriandrumsativum as an adjunct to scaling and root planing in moderate chronic periodontitis patients.(2014) J Res PharmacPract. ,3(2),67-71.