



NEEM: A HERBAL REMEDY FOR PERIODONTITIS

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ABSTRACT

Periodontal disease is characterized by inflammation and destruction of supporting tissues of the teeth. Various treatment modalities used in such conditions are antibiotics systemically or as local drug delivery as an adjunct to scaling and root planing and periodontal surgeries. *Azadirachta indica*, also known as neem is being popularly used in India and Indian subcontinent for years for maintaining healthy periodontium because of its antimicrobial action. Studies have shown a beneficial effect of neem on the periodontium. This review highlights the potential for neem to be used as a herbal remedy for the treatment of periodontal diseases.

KEYWORDS : neem, herbal, periodontitis, treatment

Introduction

Ayurveda has been used in Indian medicine for decades. It has emerged as a source for many novel therapeutic agents in oral diseases such as periodontal diseases. Several compounds have been evaluated for their effectiveness on plaque and gingivitis including bisbiguanides like chlorhexidine gluconate,¹ and essential oils.² Some of these substances have been associated with side-effects like staining that does not allow their long-term use. This led to the search for new formulations. *Azadirachta indica* (Neem), *Psidium guajava* (Guava), *Punica granatum* (Pomegranate), *Aloe barbadensis* (Aloe vera), *Curcuma longa* (Turmeric), *Vaccinium macrocarpon* (Cranberry), *Ocimum Sanctum* Linn (Tulsi), *Salvadora persica* (Meswak), *Acacia arabica* (Thorny plant), *Allium sativum* (Garlic), *Embllica officinalis* (Indian Goose berry) are various ayurvedic products used for the treatment of periodontal diseases.³ *Azadirachta indica* is the most commonly used traditional medicinal plant of India. Almost all parts of plants are endowed with medicinal properties and have been used as traditional medicines in household remedies against various human ailments.⁴

Azadirachta indica (Neem)



The neem tree (*Azadirachta indica*) has the widest spectrum of use of all natural products. Neem extract contains: Azadiractin – the active principal, Glycosides –antimicrobial, Sterols Luminols – anti-inflammatory and Flavenoids. Neem also has broad range antibacterial activity. It removes toxins from the body, purifies the blood and neutralizes damaging free radicals and locally it might also have an effect in enhancing healing.⁵

History

The first known use of neem was by the Harrappa culture in ancient India which dates back 4500 years.⁶ Today, neem extracts are used to treat various skin diseases, as an antiseptic substance, against endo and ectoparasites or simply as a herbal mouthwash. Neem extract

has also an excellent effect as a non-toxic repellent, insecticide and pesticide.⁷

Neem in the treatment of periodontitis

Periodontitis is characterized by inflammation and destruction of supporting tissues of the teeth.

The success of periodontal therapy depends upon the reduction or elimination of periodontal pathogens.⁸ Mechanical therapies, including scaling and root planing and surgery are aimed at improving the periodontal status by lowering the microbial load either by mechanical removal of plaque or by radical alteration of the sub gingival habitat. Alteration in the sub gingival habitat is achieved by administration of antimicrobial agents, either systemically or locally, that directly targets sub-gingival species residing in the plaque biofilm.⁹ Hence, a wide range of anti-microbial agents have been introduced in recent years. There has been a rise in the awareness and interest in pursuing alternative natural preparations among population especially to avoid the risk of wide range of side effects caused by allopathic medications.⁹

Azadirachta indica or neem has been used widely in the Indian subcontinent for decades of years as a remarkable tool for maintaining healthy periodontium. It is considered as a useful alternative for maintaining healthy periodontium because of its chemopreventive action.¹⁰ Neem has been considered to have an astringent, antiseptic, insecticidal, antiulcer properties.^{11,12} Biological activity of Neem is reported with the crude extracts and their different fractions from leaf, bark, root, seed and oil.

Since ancient times, Ayurveda has recommended use of tender twigs of neem as effective dentifrice and it has proven effective for the same. Majority of people residing in villages in India use neem twigs and leaves to brush their teeth, and keep their oral cavity free of disease and infection even though they have limited access to modern dental care.

Neem leaves, barks or twigs have been tried in treatment of gingivitis and periodontitis as a part of various toothpastes and has proven to be successful.¹⁰ The mechanism of anti inflammatory action of neem is by inhibiting prostaglandin E and 5 HT and thus inhibits the inflammation. The antibacterial action is due to the substance named "Azadiachtin" that is known to destroy bacterial cell wall and thus inevitably inhibit the bacterial growth. Also the breakdown of cell wall disturb osmotic pressure and leads to cell death.¹⁰ A neem-extract dental gel reduced bacteria present in plaque i.e *Streptococcus mutans* and *Lactobacilli* species

significantly.⁶ Botelho et al in a study demonstrated that *A. indica*-based mouth rinse is highly efficacious and that it may be used as an alternative therapy in the treatment of periodontal disease.¹³ Due to the bitter taste associated with this plant, several different formulations have been developed. In the clinical trial by Botelho et al, the *A. indica* extract gel was formulated along with a sweetener and flavor to increase the patient compliance and acceptability. In another study, it has also been used as a local drug delivery agent in periodontitis.¹⁴ There is a growing clinical evidence supporting the use of herbal components in toothpaste and mouthwashes, but more randomized controlled trials are required to support its use in dentistry. Its use for treatment of periodontitis is still not very clear and this warrants further studies with bigger samples to provide sufficient evidence of the efficacy of neem as an antimicrobial agent.

Conclusion

Pharmacologically active ayurvedic products useful for the treatment and maintenance of periodontal diseases have been widely acknowledged. Herbal drugs have both medicinal and economic implications which favours its use in dentistry. Use of herbal extracts in the form of dentifrice, medicated gel, local drug delivery systems represents a promising therapeutic alternative in preventing and treating periodontal disease.

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