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ROLE OF TRIPHALA IN DENTISTRY: A REVIEW

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ABSTRACT

Oral health is an integral part of general health. Poor oral health reflects social inequalities hence the prevention of oral diseases should be the priority of developed and under developed countries around the world. India is a large country with a mixture of various cultures and traditions, with a large amount of disease burden including dental caries and periodontal diseases. Teeth are very precious organ of the body, governing lot of functions like chewing, speech control, giving shape to the mouth and the most important of all is to maintain the beauty of the face. In spite of vast development of modern medical science, satisfactory treatment of “oral diseases” by newer drugs is into achieved, rater the chemical compounds has exposed the patients to its different ill effects, and therefore, there is interest to find out effective remedy of any disease by harmless herbal drugs. Ayurvedic literature contains a wealth of information on the diagnosis and treatment of dental diseases. Triphala is one such herb used in various dental diseases.

Key Words: Triphala, Phytomedicine, Dentistry, Antimicrobial, Caries, Periodontal Diseases etc.

INTRODUCTION

Ayurvedic medications have stood the test of time and since time immemorial been used for various ailments. Recently there is renewed interest in use of various ayurvedic drugs for oral and dental health. Even though dentistry was not a specialized branch of ayurveda, it is included in its shalakya tantra. Problems such as deformities of the oral cavity and oral infections were managed in ancient India. Traditional medicine can treat various infections and chronic conditions. Scientific validations of the ayurveda dental health practices could justify their incorporation into modern dental care. Publicity of these techniques using appropriate media would benefit the general population by giving more confidence in the ancient practices, thus preventing tooth decay and related problems [1]. Ayurvedic medical texts have not just indicated the herbs that could halt the oral diseases and trigger the natural remineralization of decayed tooth, but also documented the oldest history of implants. Ayurveda aims to integrate and balance the body mind and soul. It achieves a state of total wellness, because of its two

basic objectives 1) to maintain the health of those who are well and are not suffering from any disease condition. This mainly is achieved through regulating ones diet and nutrition, exercises, hygiene and lifestyle. 2) Cure the diseases of those who are sick and follow up after cure to prevent relapse of diseases. The terms oral health and general health should not be interpreted as separate entities. Oral health is integral to general health, it is said if eyes are the windows to the soul, then mouth is the doorway to health. Conventional dentist looks at the mouth in isolation, but ayurveda considers the intricate relationship between teeth gums and rest of the human body. Rather than dealing with dental concerns as they pop up, ayurveda is designed to avert common dental problems. Contemporary dental science focuses on symptomatology of the disease, treatment methods used in it are effective but chances of toxicity exist, which may weaken the body. Ayurveda tries to bring about the balance in which the body's natural defense will be strong and can easily defend against diseases [2].

One such ayurvedic herb is Triphala. It is a well known polyherbal formulation from Ayurveda. It is a Rasayana Drug used in Indian System of Medicine (ISM). It is a botanical preparation comprised of equal parts of three herbal fruits: Harada (*Terminalia chebula*, black

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myrobalan, The Buddha's Chosen Herb), Aaonla (*Emblica officinalis* or Indian gooseberry) and Bihara (*Terminalia bellerica*).

According to the renowned herbalist, Dr. Michael Tierra, Tibetans so revere Harada that the fruit is depicted in the hand of the "Medicine Buddha" in sacred paintings. Numerous studies have found that *Terminalia chebula* (TC) supports digestion and aids in treating both acute and chronic constipation. Aaonla is the edible fruit from a small tree native to India. As with *Terminalia chebula*, this has been shown to increase gastric emptying and to possess a broad spectrum of antimicrobial activity against a number of test bacteria. Bihara is rich in protein (40 percent) and oils (35 percent), and is particularly high in the omega 3 essential fatty acid, linoleic acid & has free radical scavenging property and antimicrobial activity [3].

It is one of the Ayurvedic medicinal herbal formulations prescribed by most health care practitioners. It is gentle for people of all ages from children to seniors. In Ayurveds Triphala is termed as a tridoshic rasayana and to have balancing and rejuvenating effects on the three constitutional elements that govern human life (Vata, Pitta and Kapha). It is employed to treat conditions like headache, dyspepsia, ascites and leucorrhoea. It is also used as a blood purifier and possesses anti-inflammatory, analgesic, anti-arthritis hypoglycemic and anti-aging properties. It is claimed to have antiviral and antibacterial effect. It is prescribed for various symptoms of fatigue, assimilation and infectious diseases such as tuberculosis, pneumonia, AIDS, periodontal diseases. It is reported to reduce considerably the damage due to oxidative stress. It inhibits the growth of Gram positive and Gram negative bacteria. It is rich in gallic acid, Vitamin C, ellagic acid, chebulic acid, bellericanin, β -sitosterol and flavonoids [4].

Triphala as an Anticancer Drug:

Triphala possesses cytotoxic effect on cancer cell line. . The biopotency of triphala is mainly due to the presence of gallic acid and tannins. Gallic acid is the major component and cause suppression of growth of cancer cells. It induces cytotoxicity in tumor cells but not in normal cells. It has a chemoprotective role against 1,2 – Dimethylhydrazine, Dihydrochloride induced cancer, by decreasing lipid peroxidation activity of lactate dehydrogenase (LDH), increase in level of reduced glutathione (GSH); it prevents peroxidative damage. It reduces tumor incidence by increasing the antioxidant status. It can be given in curing oral mucosal lesions. Tannins act as antioxidant and improve blood circulation. The antioxidant action is by inhibition of free radical formation and acting as a scavenger for free radicals [5].

Triphala in Periodontal Diseases:

Observation shows that when gingival inflammation and periodontal pockets are present, the number of organism increases. Despite a great deal of

research no specific organism or group of organisms has yet been identified as causals. It is assumed that the toxic products of bacterial origin produce periodontal disease. However, there is some evidence that specific microorganisms may be involved.

Bacterial plaque is known to have an etiologic role in inflammatory periodontal disease, and bacterial invasion may be an important aspect of chronic periodontal disease. The history of knowledge about Dantamulagata rogas in Ayurveda is traced back to the period of syshruta. Dantamulagata roga have close relation to the chronic gingivitis and chronic periodontitis. For many regions the satisfactory treatment of the periodontal disease has not been achieved by the practioners till now. It is chiefly contributed to by – (1) Paucity of knowledge concerning the details of the definitive mechanism that plays role in the creation of such disease (2) Difficulty to maintain proper oral hygiene (3) Side effects of the modern drugs which limit their prolonged use for the permanent cure of disease. Sushruta has described that triphala pacifies that kapha and pitta dosha, which are the main causative factors of the periodontal diseases. He has also emphasized that the triphala has hemostatic, anti-inflammatory, analgesic and wound healing properties. Haritaki is most efficacious for bleeding gums and gingival ulcers and carious teeth. On the other hand Amalaki contains enormous vitamin 'C' which is most essential to prevent the bleeding from gums [6].

A bacteriological study was done with the triphala decoction. The study has demonstrated that triphala has a good antibacterial property and it is sensitive to 16 (72.7%) bacteria out of 22. Although triphala cured periodontal disease without any side effects or toxicity. Yet a detailed scientific enquiry is required into various aspects of its pharmacological and clinical effects before this drug could be recommended for the treatment of periodontal disease. It is also to be mentioned that a broad antibacteriological study can be made upon various bacteria. Triphala alone is capable to provide partial relief but when combinedly used with other drugs such as metronidazole, more effective for the treatment of periodontal disease. However, it is further suggested that triphala and metronidazole as a combined treatment regimen should be used for local (like gargling and mouthwash) and systemic administration [7]. Triphala also possess an effective antiplaque activity. The ethonolic extract of the formulation has higher antioxidant activity and inhibits *Streptococcus mutans*. Triphala extract inhibits the biofilm formation and protects gum cells due to antioxidant activity.

Hypertrophy of Gingiva:

Massage the inflamed gums with sesame oil, triphala, alum, kshara (alkali), khadira (acacia catechu) [8].

Triphala as an Antiplaque Agent:

Periodontal diseases are among the most common infectious diseases affecting human kind and can lead to destruction of the periodontal ligament, cementum, gingiva and alveolar bone. Plaque is the primary etiological factor in gingival inflammation. Thus, control of dental plaque holds the key to halt the progression of periodontal disease. Since a majority of population is not able to perform plaque control effectively, the onus lies on the dental health care provider to impart the correct knowledge about the oral hygiene aids and adjunctive use of various chemical plaque control agents. Chemotherapeutic mouth rinses provide chemically significant benefit in the reduction of plaque induced gingivitis. Mouth rinses have the ability to deliver therapeutic ingredients and benefits to all accessible surfaces in the mouth including interproximal surfaces. They also remain effective for extended period of time depending on their substantivity.

Chlorhexidine has been prescribed by dentists for decades and accepted as the gold standard in reducing dental plaque as it has profound antiplaque and antibacterial properties. However, it has few undesirable side effects primarily brown staining of the teeth and transient impairment of taste sensation. Recently, numerous studies have been conducted to verify the enormous wealth of medicinal plants. These herbal mouthwashes are gaining popularity as they contain naturally occurring ingredients called as Phytochemicals that achieve the desired antimicrobial and anti-inflammatory effects. Herbal formulations may be more appealing because they work without alcohol, artificial preservatives, flavors or colors [9].

The herbal product made of equal proportion of *Terminalia chebula*, *Terminalia belerica* and *Emblica officinalis*, were evaluated. Ethanol extracts of the formulation were tested for its total antioxidant activity using improved ABTS radical cation decolorizing assay and antibiotic assay against *Streptococcus mutans* (predominantly involved in bio-film formation on human teeth). An effort was also made to correlate its antiplaque activity using an in-vitro assay (conditions were kept similar to oral cavity) with Triphala and two commercial toothpastes (Product 1 and product 2). The herbal extract effectively inhibited the bio-film formation and the better antioxidant activity exhibited by the extract might protect the gum cells effectively from free radicals than the commercial toothpastes. Thus Triphala can be used as an effective antiplaque agent [10].

Triphala in Endodontics:

This is an ayurvedic rasayana consisting which is rich in citric acid & may aid in removal of smear layer thereby acting as chelating agent and also found to be alternative to sodium hypochlorite for root canal irrigation [11].

Triphala as Antibiotic:

Based on in vitro studies, Triphala (a combination of *Terminalia chebula*, *Terminalia bellerica*, and *Emblica officinalis*) may have antibacterial activity against several bacterial isolates, including various species of *Pseudomonas*, *Klebsiella*, *Clostridium*, *Shigella*, *Staphylococcus* (including beta-lactamase-producing methicillin-resistant *Staphylococcus aureus*), *Vibrio*, *Salmonella* (including multidrug-resistant *Salmonella typhi*), *Escherichia*, *Enterobacteria*, *Corynebacteria*, *Enterococcus*, *Bacillus*, *Proteus*, and *Helicobacter pylori* [12].

Triphala as Antifungal Agent:

Based on in vitro studies, extracts of *Terminalia chebula* may inhibit the growth of *Trichophyton* species, *Candida* species (including clotrimazole-resistant *Candida albicans*), *Aspergillus* species, and *Torulopsis glabrata*. It can be used in fungal infections of oral cavity [13].

Triphala as Antiviral Agent:

Based on in vitro studies, extracts of *Terminalia chebula* may inhibit human immunodeficiency virus-1 reverse transcriptase, and *Terminalia chebula* and Ledretan-96 (an herbal formula containing *Terminalia chebula*) may protect against damage caused by influenza A virus. Based on animal studies, *Terminalia chebula* may inhibit replication of human cytomegalovirus (CMV) and murine CMV (MCMV) in MCMV infection models of immunosuppressed mice, and the combination of acyclovir with *Terminalia chebula* may have strong therapeutic anti-herpes simplex virus type 1 activity in mice. Trials need to be done on humans [14].

Triphala in Oral Ulcers, Stomatitis & Halitosis:

Combination of several natural ingredients like Triphala, Neem, Babool, Meswak, Tumburu or toothache tree, Pomegranate and Natural Fluoride makes Himalaya's Dental Cream unique in addressing adult dental problems like bleeding gums or gingivitis, bad breath and plaque among others. Triphala is rich in tannins and phenolic compounds which are responsible for antioxidant properties. It also helps in healing mouth ulcers [15].

Triphala as Anticaries:

Dental caries in young children has a multifactorial etiology; therefore preventive measures usually involve a combination of dietary counseling, oral hygiene and fluoride application. None of these interventions specifically target *Streptococcus mutans*, the chief pathogen responsible for caries. Therefore, current methods of caries management which are limited to traditional preventive approaches in combination with restorative treatments have proved inadequate to control the disease. New methods of managing dental decay in the primary dentition need to be developed. An antibacterial

agent that is effective and also acceptable to young children will be a useful supplement to current techniques for the prevention of caries. *Chlorhexidine* is the antimicrobial agent most familiar to dental professionals for prevention of dental caries in children. The need for frequent application of *Chlorhexidine*, and other side effects such as unpleasant taste and staining, has stimulated the search for alternatives that are more appropriate for young children. "*Triphala*" is among the most common formulas used in Traditional *Ayurvedic* Medicine. In this context, a study was undertaken to ascertain the effects of a mouthwash prepared with *Triphala* on the oral health status and compare it with commercially available *Chlorhexidine* mouthwash. Students in Group I used *Triphala* in a concentration of 0.6%. Similar concentration was used in a study by Gupta *et al*, wherein 0.6% *Triphala* was highly effective in preventing plaque accumulation and gingivitis [16].

Nearly 60–70% of the child Indian population suffers from dental caries. Mouth rinsing is the most cost effective method of preventing dental caries. '*Triphala*' has been a classic *Ayurveda* remedy, probably the best known among all *Ayurvedic* compounds. This study was conducted on 1501 students in the age group of 8-12 years with the aim of determining the effect of *Triphala* mouthwash on prevention of dental caries (manifest caries) as well as incipient carious lesions, and also comparing the effect of *Triphala* and chlorhexidine mouthwashes. The incipient caries was recorded at 3, 6, 9 months intervals and manifest caries at 9 months interval. No significant increase in the DMFS scores was found at the end of 9 months. Also, there was no significant increase in the incipient caries score towards the conclusion of the study. It was concluded that there was no significant difference between the *Triphala* and the chlorhexidine mouthwashes.

Another study done to assess the anticaries activity of individual ingredient of *triphala*, *Terminalia chebula*, showed significant increase in pH, increase in buffering capacity of saliva with 65% decrease in the microbial count for *Streptococcus mutans* and a 71%

decrease for lactobacilli, thus significant anticaries activity [17].

A study was done to test and compare the antimicrobial activity of aqueous and alcoholic extracts of both *Triphala* and *Triphala Mashi* against pathogens by using agar gel diffusion method. Results showed that *Triphala Mashi* containing phenolic compounds, tannins which exhibited comparable antimicrobial activity in relation to *Triphala* against all the microorganisms tested. It inhibits the dose-dependent growth of Gram-positive and Gram-negative bacteria.³ Another study was done to correlate, elucidate and compare the antimicrobial and anti-oxidant activity of *Triphala* plant extract and commercial toothpastes against *Streptococcus mutans*. Results showed that herbal extract effectively inhibited the biofilm formation and better anti-oxidant property exhibited by the extract might protect the gum cells effectively from free radicals than the commercial toothpastes [18].

CONCLUSION

Plaque-related diseases, dental caries and periodontal diseases are among the most important preventable global infectious diseases. In addition to mechanical plaque removal nowadays the phytomedicine use is gaining attention throughout the world. Plants are rich in a wide variety of secondary metabolites, such as tannins, terpenoids, alkaloids, and flavonoids, which have been found to have antimicrobial properties. The phytomedicine, today, symbolize safety, in contrast to the synthetics that are regarded as unsafe to humans and the environment. Plant extracts have been used in dentistry for reducing inflammation, as antiplaque agents, for preventing release of histamine and as antiseptics, antioxidants, antimicrobials, antifungals, anti-bacterials, anti-virals and analgesics. *Ayurveda* is not a substitute for contemporary dentistry but can be used in conjunction with it. This amalgamation of the two streams of treatment will work together for overall benefit of the patient, recognizing the fact that mouth impacts the overall health of a person.

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