ARE HERBAL DRUGS BETTER THAN CONVENTIONAL DRUGS IN PERIODONTITIS

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ABSTRACT

Periodontal disease is a general term used to describe various pathological conditions which affects the supporting tissues of dentition. Herbalism is a medical system based on the use of plant extracts. Herbal medication has been employed by many various cultures throughout the planet to treat unwellness and to help bodily functions. Herbal preparations will be derived from the basis, leaves, seeds, and flowers. The preparations often contain a concoction of chemical substances which contain minerals and vitamins determining a specific active ingredient. Rising the price of medication, rising antibiotic resistance and perceived safety of herbal medication has light emitting diode to its quality among shoppers, medical practitioners and researchers. In the field of medication, several plants have established their importance in treating unwellness all round the world. Herbs are wide studied owing to their chemical constituents or phytochemicals presents in varied elements of the plants.

Keywords: Herbals, Periodontitis, Therapy, Dentistry, Phytochemicals

INTRODUCTION

The periodontium consists of the investing and supporting tissues of the tooth, Periodontal Ligament, cementum and alveolar bone. The gingiva protects the underlying tissue and attachment apparatus. Periodontium is subject to morphological and functional variations as well as changes associated with age[1]. Periodontitis a gum disease affecting many worldwide may be associated with systemic diseases, auto immune disorders, hormonal changes, syndromes or may not be associated with no such factors. Plaque is considered to be to initiate mostly all the diseases affecting the periodontium or the tooth. It may play a significant role in the progression and severity of the disease. There is balance between the bacteria and the immune response from the host individual. Imbalance causes the pathogenic bacteria to multiply and also the addition of the pro

inflammatory mediators to cause periodontal destruction and eventually tooth loss. Early diagnosis and the specific treatment is the key to the success of therapy[2]. The primary goal of dental care is to preserve the natural dentition by achieving and maintaining a healthy periodontium. It consists of patient motivation and oral hygiene maintenance moreover as mechanical removal of sub-gingival plaque and calculus deposits, correction of plaque-retentive factors and risk factor modification [3]. Many connected treatment modalities are clinically used and investigated for his or her efficaciousness. Periodontal diseases are associated with bacterial infections hence antibacterial treatment is an appropriate method of improving the condition of the inflamed tissues. One of the major problems associated with conventional treatment of systemic administration of antibiotics is the distribution of drug throughout the body, which is not required and it can also give rise to toxicity problems[4]. Periodontal local delivery devices that have been used for the targeted delivery of antimicrobial agents include: fibers (hollow and monolithic), strips and compacts, films, microparticles, gels and nanoparticles[5]. Despite many chemical agents being commercially accessible, these will alter oral microbiota and have undesirable side-effects like puking, looseness of the bowels and tooth staining[6,7].

Twentieth century saw the gain in quality of herbal-based product among customers thanks to the perceived safety with reduced aspect effects. Plant herbs are extremely effective as medicine agents owing to their ability to penetrate and cause injury to the walls of each gram positive and gram negative microorganism. This finally, will lead to the destruction of the bacteria cells[8]. Research specialize in the utilization of herbs to treat chronic diseases like caries, gingivitis and periodontal diseases. The specialty requires more information through research to establish the safe practice of herbal derived products as an evidenced based treatment. Some non-woody plants that are studied to treat these oral diseases. A large majority of naturally occurring herbs are being studied for their potential uses in dentistry, but only few have been approved for their commendable medicinal properties due to the lack of clinical trials in this field. Some of the important herbs and their use in dentistry and oral care. The purpose of this review is to present some examples of traditional medicinal plant extracts or phytochemicals that have been shown reduce the development of dental plaque by inhibiting the growth of oral pathogens and to reduce the symptoms of oral diseases. Our mouths are full of bacteria. Bacteria, at the side of secretion and alternative particles, perpetually kind a sticky, colorless “plaque” on teeth. Brushing and flossing help get rid of plaque. Plaque that's not removed will harden and that brushing doesn’t clean. Only a professional cleaning can remove tartar. An inflammatory condition of the tissues of the periodontium that affects up to 90% of the world’s population is periodontal disease. Resistance to antibiotic and antimicrobial in oral biofilms has made medicinal plants an interest in the potential use to treat periodontal pathologies. More numbers of *in vitro* and *in vivo* studies on herbs traditionally used for their anti-bacterial properties in ethno-pharmacological applications. Current status is medicinal plants can be used in the treatment and management of periodontal disease[9].

BENEFITS OF HERBAL DRUGS

Herbal drugs[10] have good patient tolerance and better acceptance by public. Herbal drugs are only source and only hope for cheaper medicines for the worlds growing population. Medicinal plants availability is easy in developing countries like India due to rich agro-climatic, cultural and ethnic biodiversity. Herbal medicine has provided many of the useful and vast variety of drugs to the modern medical science. Older adult populations are more likely to use medicines. This population is seeming to possess the higher incidence of chronic disease, which more often requires the use of increasingly complex conventional drug therapy. At present, there is a dearth of research evaluating the use of herbal medicines, especially clinical trials. This, together with the ongoing development of recent typical drug therapies, further compounds the amount of unknown outcomes once victimization parts of these two treatment approaches together. In many countries herbal medicines are not regulated as extensively as conventional drug therapy. Also, globalization has greatly increased accessibility of medicinal herbs from all elements of the globe to any single consumer. Clearly there's an excellent want for coordinated efforts to conduct the mandatory clinical trials to review the effectualness and safety of herbs in medicines alone and in conjunction with typical drug therapies[11].

The consumption of herbal medicines getting increased throughout the world as an alternative therapy for a number of health issues including cardiac diseases, diabetes mellitus, hypertension, and types of cancer. However, unlike therapeutic drugs, herbal drugs are not mostly regulated for purity and potency. Herbal drugs are considered as food integrators and easy to buy in the market without prescription[12]. Tribal healers in many of the countries, where herbal treatment is used to treat wounds, infection in skin, edema, aging, mental illness, carcinoma, asthma, diabetes mellitus, jaundice, scabies, eczema ,venereal diseases, snakebite and gastritis, teach local people how to prepare medicine with plants. There are no written records and the information is exchanged on verbally from generation to generation. World Health Organization (WHO) shows great interest in documenting the use of medicinal plants used by tribals from various parts of the world. Many countries had made their efforts in documenting data on medicinal plants. Research to seek out scientific proof for claims by healers on Indian herbs has been intense. Once these preparations are scientifically evaluated properly, people will be informed regarding efficacious drug treatment and improved health status[13].

SAFETY AND EFFICACY OF HERBAL REMEDIES

Herbal medicines are believed to be benign and to not cause severe toxicity. Some of the herbal medicines can cause severe toxicity and even death. Many herbal products contain multiple herbs, making it difficult to attribute the effects to a specific ingredient contained within a given supplement[14]. There is a need to ensure the public safety and effective quality control of herbal preparations. This can be done by ensuring the standardization of the several aspects such as nomenclature of common medicinal plants and other resources, their collection practices, semi processes and final processing, packaging, preservation,

storage, product life, labeling and modes of distribution including clinical application to ensure quality, safety, and efficacy[15]. Thin-layer chromatography, gas chromatography, high-performance liquid chromatography, mass spectrometry, infrared-spectrometry, ultraviolet visible spectrometry used alone or in combination, are used for standardization and to control the quality of the raw material and the marketed herbal products. The recent advances that occurred in the processes of purification and isolation of naturally substance made it possible to make strategies for the checking the quality and standardization of herbal products and to maintain the homogeneity of the herbal extract[16].

PREPARATION OF EXTRACTS

The powdered materials were successively extracted with ethanol by hot continuous percolation method in Soxhlet apparatus for 24 hrs. The extract was focused by employing a rotary evaporator and subjected to freeze drying in a lyophilizer, until dry powder was obtained. Phytochemical screening of ethanolic extract was subjected to the detection of assorted plant constituents. The term chemical analysis refers to the establishing and providing the identity of a substance. The medicine actions of these medication were determined by the character of their constituents the phytoconstituents area unit liable for the required therapeutic properties. To obtain these medicine effects, the plant materials itself or extract in a suitable solvent or isolated active constituent may be used. Ethanol is a bio-solvent and it is suitable for extraction of active constituents from plants. The ethanolic extract was subjected to the subsequent chemical tests used for the identification of different active constituents[17].

PLANTS WITH ANTIMICROBIAL AND ANTIOXIDANT PROPERTY

The plaque bacteria are primarily responsible for dental caries and periodontal diseases[18,19]. Several antimicrobial agents such as chlorhexidine, fluorides, and various antibiotics are used as antiplaque and anticaries agents. However, these agents have been reported to exhibit undesirable side-effects that include nausea, vomiting and tooth staining. Hence, there is a continuous search for alternative products that can combat dental caries and periodontal diseases simultaneously[20]. Aloe (*Aloe barbadensis* and *Aloe vera*), Apple (*Malus sylvestris*), Ashwagandha (*Withania somniferum*), Bael tree (*Aeglemarmelos*), Basil (*Ocimum basilicum*), Betel pepper (*Piper betel*), Black pepper (*Piper nigrum*), Buttercup (*Ranunculus bulbosus*), Cashew (*Anacardium pulsatilla*), Castor bean (*Ricinus communis*), Ceylon cinnamon (*Cinnamomum verum*), Chilipeppers, paprika (*Capsicum annuum*), Clove (*Syzygium aromaticum*), Coriander, (*Coriandru msativum*), Eucalyptus (*Eucalyptus globules*), Garlic (*Allium sativum*), Gotu kola (*Centella asiatica*), Turmeric (*Curcuma longa*), Green tea (*Camellia sinensis*), Henna (*Lawsonia inermis*), Licorice (*Glycyrrhiza glabra*), Marigold (*Calendula officinalis*), Olive oil (*Oleaeuropaea*), Onion (*Allium cepa*), Papaya (*Carica papaya*), Peppermint (*Mentha piperita*), Pomegranate (*Punica granatum*), Poppy (*Papaver somniferum*), Potato (*Solanum tuberosum*). Plants with antioxidant property[21] such as *Albizia procera, Spinacia oleracea, Piper nigrum, Camellia sinensis, Daucus carota,* grape (*Vitis Vinifera*), olive (*Olea europaea*), Pineapple (*Ananas comosus),* Strawberry (*Fragaria X ananassa*) and Orange (*Citrus X sinensis).* Hegger *et al*., showed herbs have

antibacterial properties against *Candida albicans, Streptococcus pyogens, Streptococcus fecalis*. Noskova used Aloe vera to treat early stages of periodontitis and got good results[22]. The microorganisms found in inflamed gums shows proof against antibiotic drug and bactericide, however no proof against medicine from plant extracts like have not show such allergy. Unlike antibiotics, antibacterial plant extracts produced no allergy in the gingiva that could inhibit their effectiveness[23]. In a clinical study, 50 patients with confirmed gingivitis were selected, 40 showed severe bleeding and pustular discharges from the gums. After simply 3 weeks of brushing double each day with paste as well as leaf extracts of neem, eight out of ten patients showed significant improvement. The patients conjointly showed a discount in microorganism populations and elimination of halitosis (bad breath) with no aspect effects. Research showed that pomegranate extract was simpler against the adherence of biofilm[24]. *Punica granatum* extracts following scaling and root planing showed significant improvements in pocket depth and attachment level compared to placebo[25]. A recent study proved that pomegranate mouthwash had antibacterial efficacy against *Aggregatibacter actinomycetemcomitans*, *Porphyromonas gingivalis*, *Prevotella intermedia*, which are the most important periodontal pathogens[26].

OTHER USES OF HERBALS IN DENTISTRY

A 10% topical pomegranate *(Punica granatum* belonging to the family lythraceae gel was economical in reducing repeated aphthous inflammation pain and time for complete healing of ulcers. This was attributed to its antiinflammatory, inhibitor and antimicrobial properties of pomegranate**.** An 80% pomegranate peel extract lozenge was able to decrease gag reflex in soft palate up to 88.5% and in tonsils up to 92.5%. This impact can be because of the presence of tannins that have anesthetic effects. A gel based *Punica granatum* bark extract was effective in treating denture stomatitis as effectively as miconazole. Studies showed the phytochemical activity of ethanolic extract of aerial components of *Albizia procera Roxb. (Benth.)* belonging to the family Mimosaceae showed the presence of triterpenoids, carbohydrates, glycosides, phytosterols, phenolic compounds, saponins, tannins and flavonoids. Each active compound shows completely different activities against different form ofdiseases like cancer, liver disorders, diabetes, atherosclerosis and inflammatory diseases etc. It also possesses antioxidant properties. According to their characteristics, they can be involved into medicinal plant category[27]. Green tea, (*Camellia Sinensis*) from the family of Theaceae is mostly cultivated in coasts of Caspian sea in North of Iran. Its remedial effects are associated with the polyphenol contents comprising catechin (C), epicatechin (EC), gallocatechin (GC), epigallocatechin (EGC), epicatechingallate (ECG), and epigallocatechingallate (EGCG).The two latter square measure in the main found in tea leaf instead of the tea leaf and square measure among most potential contents to be reviewed for odontology adjunct therapies in terms of their special anti-collagenase activity. In addition, it is suggested that EGCG inhibits the growth and cellular adherence of periodontal pathogens[28]. *Withania somniferum*[29] was assessed by the Clinical anecdotal evidence supporting the beneficial use of antioxidants for desquamative gingivitis lesion. Therefore antioxidants are often added to the standard treatment modalities of such lesions

use as a primary treatment possibility as a substitute to the corticosteroids. Ethanol (cold and hot) extracts prepared from peel of *Citrus* sinensis[30] were screened for in vitro antimicrobial activity against eubacteria mutans and Lactobacillus acidophilus, by agar well diffusion methodology. *Citrus sinensis* peels extract was found to be effective against caries pathogens and contain compounds with therapeutic potential. Nevertheless, clinical trials on the effect of these plants are essential before advocating large-scale therapy. Pineapple extract (bromelian)[31] was used to assess the antibacterial efficacy on both aerobic and anaerobic periodontal microorganisms. Bromelain is a protein- digesting enzyme complex that's found in fruit juice and within the pineapple stem. Minimum restrictive concentration (MIC) of bromelain was tested on isolated strains of streptococci mutans, *Enterococcus fecalis*, *Aggregatibacter actinomycetemcomitans* and *Porphyromonas gingivalis* mistreatment serial dilution broth methodology. Staphylococcus mutans showed sensitivity at the bottom concentration of 2 mg/ml as compared to Enterococcus fecalis (31.25 mg/ml) whereas *Porphyromonas gingivalis* showed sensitivity at the bottom concentration of four.15 mg/ml as compared to *Aggregatibacter actinomycetemcomitans* (16.6 mg/ml). Bromelain exerts medicinal drug impact against potent dentistry pathogens; hence, it may be used as an antibacterial agent. However, additional trial has got to be conducted to validate this result. Grape seed extract[32] possess an array of compounds which prevent chronic inflammatory diseases, by scavenging free radicals, inhibiting collagenases, histamine etc, disrupting plaque and improving immunity. Time has come to shift the treatment paradigm from blind eradication of bacteria by chemotherapy to modify the aggregation, neutralizing there by-products and enhancing mucosal immunity of host using natural products. Feyza[33]study aimed to demonstrate the effect of Grape Seed Extract (GSE) on periodontitis. The results suggest grape seed extract shows potent anti-inflammatory activity.

DISCUSSION

Approximately 1250 Indian medicinal plants are being used to formulate beneficial measures according to ayurvedic or other ethnicity. About one-fourth of drugs are manufactured from plants, and many other are formulated from prototype compounds isolated from plant species. With respect to diseases caused by microorganisms, the increasing resistance in many common pathogens to currently used therapeutic agents, such as antibiotics and antiviral agents, has junction rectifier to revived interest within the discovery of novel anti-infective compounds[34]. As there are close to five lakhs of plant species occurring worldwide, of which only1% has been phytochemically investigated, there is great potential for discovering novel bioactive compounds from these sources.

Action of Various Herbal Extracts On Plaque[35], Ramisetty Sabitha Devi *et al.*, shows the use of these herbal extracts in the form of chewing sticks, tooth pastes, mouth rinses and gum is entirely consistent with the primary health care approach principles and in particular that of a focus on prevention, community participation and the use of appropriate technology. Wolinsky LE, Sote EO *et al.*, studied eight varieties of commonly used chewing sticks from Nigeria, among which *serindeia Warnecki* inhibited the growth and adherence of streptococcus mutans

comparable to that of 10-4M Chlorhexidine. *Anoigeissus Schimperi* was also a strong inhibitor of bacterial growth (26%) when added at a concentration of 1%. *Fagara Xanthoxyloides*, on the other hand showed no significant reduction in bacterial growth or adherence. The remaining plant extracts showed varying degrees of inhibition to growth and adherence. The gum of Acacia Arabica[36] has been studied for its effect on plaque and gingivitis and has been found to have the potential to inhibit early plaque inhibition and its action on suspected periodontal pathogens like *Porphyromonas gingivalis* and *Porphyromonas intermedia* has been suggested to be of clinical value. An *in vitro* study compared the effectiveness of *Morinda Citrifolia* Juice (MCJ) with sodium hypochlorite and Chlorhexidine to remove the smear layer from the root canal walls of instrumented teeth. It was concluded that the efficacy of *Morinda Citrifolia* [37] was similar to sodium hypochlorite in conjunction with Ethylenediaminetetraacetic acid (EDTA) as an intracanal irrigant. The antimicrobial activity of 2% Chlorhexidine gel propolis, *Morinda Citrifolia* juice and calcium hydroxide has been compared on Enterococcus faecalis infected root canal dentin at two different depths and three intervals. It was concluded that Propolis and *Morinda Citrifolia* were effective against Enterococcus faecalis in dentin on extracted teeth. *Morinda Citrifolia* appears to be the first juice to be identified as a possible alternative to the use of sodium hypochlorite as an intracanal irrigant.

Bloodroots (*Sanguinaria canadensis*) is a perennial, herbaceous flowering plant native to eastern north America, belonging to the family papaveraceae, contains a mixture of alkaloids, but principally sanguinarine, that's accessible in business toothpastes and mouth rinses and has properties that unit useful in preventing microorganism plaque formation[38].Sanguinarine containing sloe release polymer systems are currently being developed for use in periodontitis treatment applications. Clove Oil is of the foremost effective treatments to cure periodontitis and different gum connected diseases. Rub the gums with clove oil or just chew a piece of clove[39]. Guava being made in water-soluble vitamin, guava is additionally thought of a wonderful remedy for disease. It works as an anti-plaque agent and helps remove plaque accumulated[40] on the teeth and gingiva. Its anti-inflammatory and analgesic properties help reduce swelling and pain on the gingiva. A study conducted on cinnamon extract on gingival health indicated that cinnamon may prove to be an effective agent owing to its ability to reduce plaque level and gingivitis[41].Periodontal disease negatively affects patient's quality of life impairing aesthetics, phoenetics, mastication and function, especially when it is related to tooth loss. A recent systematic review demonstrated that non-surgical therapy can moderately improve the oral-health-related quality of life[42].One of the most basic problems with the use of herbs is that there is lack of consistent terminology when describing what category herbs fall under. For example, a single product may be classified as a food product by some and as a dietary supplement by others. Therefore, this product may have multiple concurrent regulations depending on how it is classified. In the United Sates, the 1994 Dietary Supplement Act[43] provides the regulatory framework for herbal medicines. This Act is considered to be industry friendly and does not apply Good Manufacturing Practice (GMP) standards that are required for conventional drug therapy. Use of clove oil is an age old remedy still practiced for

periodontal problems. Our aim is to present an overall view of the current strategies adopted for the formulation and application of traditional herbal remedies. The article provides a review of the patents obtained on herbal remedies for the treatment of periodontal diseases. In addition, it also provides an overall view of potent herbal remedies widely used for periodontal diseases[44].

CONCLUSION

Herbal and natural agents are used for hundreds of years in each culture throughout the globe. It's still true today that "you are what you eat." The use of herbal extracts in various forms is entirely consistent with the primary health-care principles. These aid in healing and are effective in controlling microbial plaque in gingivitis and periodontitis. Studies for assessment of safety and effectualness of seasoning remedies are in its infancy. Herbal remedies are expected to be widely used in future. Researchers ought to be inspired to conduct controlled studies to prove the effectiveness and safety of natural dental agents. The low toxicity and low cost of these herbs should encourage further investigation leading to a better understanding on traditional Asian medicine and their application to oral health. Moreover, health educators must consider the challenge to ensure that people participate in making decisions about the herbal medicine to protect the public health. Researchers ought to be inspired to conduct controlled studies to prove the effectiveness and safety of natural dental herbal products. The low toxicity and low cost of these herbs should encourage further investigation leading to a better understanding on traditional Asian medicine and their application to oral health.

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