Role of Ayurveda in management of oral health

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ABSTRACT

Oral diseases continue to be a major health problem world-wide. Oral health is integral to general well-being and relates to the quality-of-life that extends beyond the functions of the craniofacial complex. The standard Western medicine has had only limited success in the prevention of periodontal disease and in the treatment of a variety of oral diseases. Hence, the search for alternative products continues and natural phytochemicals isolated from plants used in traditional medicine are considered to be good alternatives to synthetic chemicals. The botanicals in the Ayurvedic material medica have been proven to be safe and effective, through several hundred to several thousand years of use. The exploration of botanicals used in traditional medicine may lead to the development of novel preventive or therapeutic strategies for oral health. The present scientific evidence based review is focused on the possible role of Ayurveda in the management of various orofacial disorders.

Key words: Ayurveda, dentistry, oral health, orofacial disorders

INTRODUCTION

Oral diseases continue to be a major health problem world-wide. Dental caries and periodontal diseases are among the most important global oral health problems, although other conditions like oral and pharyngeal cancers and oral tissue lesions are also of significant concern. Oral health is integral to general well-being and relates to the quality-of-life that extends beyond the functions of the craniofacial complex. The link between oral diseases and the activities of microbial species that form part of the micro biota of the oral cavity is well-established. The global need for alternative prevention and treatment options and products for oral diseases that are safe, effective and economical comes from the rise in disease incidence (particularly in developing countries), increased resistance by pathogenic bacteria to currently used antibiotics and chemotherapeutics, opportunistic infections in immunocompromised individuals and financial considerations in developing countries. Despite several chemical agents being commercially available, these can alter oral micro biota and have undesirable side-effects such as vomiting, diarrhea and tooth staining. Furthermore, the standard Western medicine has had only limited success in the prevention of periodontal disease and in the treatment of a variety of oral diseases. Hence, the search for alternative products continues and natural phytochemicals isolated from plants used in traditional medicine are considered as good alternatives to synthetic chemicals.

Ayurveda is the ancient Indian system of health-care and longevity. It involves a holistic view of man, his health and illness. Ayurvedic treatment is aimed at patient as an organic whole and treatment consists of salubrious use of drugs, diets and certain practices. Currently, Ayurveda is widely practiced in the Hindustan peninsula (India and the neighboring countries) and in recent years, has attracted much attention in economically developed countries such as those in Europe and in the United States and Japan. There are approximately 1250 Indian medicinal plants that are used in formulating beneficial measures according to Ayurvedic or other ethnicity. This 5000-year-old system of medicine recommends treatments with specific herbs and minerals to cure various diseases. The botanicals in the Ayurvedic material medica have been proven to be safe and effective, through several hundred to several thousand years of use. The exploration of botanicals used in traditional medicine, may lead to the development of novel preventive or therapeutic strategies for oral health. As most of the oral diseases are due to bacterial infections and it has been well-documented that medicinal plants confer considerable anti-bacterial activity against various microorganisms including bacteria’s responsible for dental caries.
The dentist needs to be more informed regarding the use, safety and effectiveness of the various traditional medicines and over-the-counter products. As this is hardly explored part for the field of dentistry, there is a need for integration of professional dental treatment modalities and complementary alternative medical (CAM) systems to provide the best and unique from each system to patients as a complementary therapy and an alternative choice of treatment.\(^\text{[19]}\) Considering the importance of various traditional or CAM systems, the present scientific evidence based review of literature is focused on the possible role of Ayurveda in the management of various orofacial disorders.

**MATERIALS AND METHODS**

In this review of the literature, we only considered those studies that include individual plants or mixtures of plants consistent with the philosophy of Ayurveda. The databases searched for the current review were Medline, Natural Products Alert Database, and related databases, such as AYUSH Research Portal, National Library of Ayurveda Medicine, Systematic Reviews in Ayurveda, Ayurveda Database, Web of Science, Indus Medicus and Google Scholar; by consulting existing bibliographies; by using both forward and backward reference chaining techniques; and by tracking recent activities in the field of Ayurveda, which is primarily concerned with prevention and management of orofacial disorders. In addition, we also collected literature on traditional medicine and searched some Indian journals not included in Medline. References that were primarily anecdotal or that were only peripherally related to the topic were excluded.

**Ayurveda and the concept of health**

Susruta Samhita, the surgical compendium of Ayurveda, defines health as “the equilibrium of the three biological humors (doshas), the seven body tissues (dhatus), proper digestion and a state of pleasure or happiness of the soul, senses and the mind.”\(^\text{[16]}\)

A balance among the three doshas is necessary for health. Together, the three doshas govern all metabolic activities. When their actions in our mind-body constitution are balanced, we experience psychological and physical wellness. When they go slightly out of balance, we may feel uneasy. When they are more obviously unbalanced, symptoms of sickness can be observed and experienced.\(^\text{[17,18]}\)

**Ayurveda and orofacial diseases**

According to the Shalyatantra and Shalakyatantara (one of the branches of Ayurveda), 65 varieties of oral diseases can arise in seven anatomic locations—eight on the lips, 15 on the alveolar margin, eight in connection with the teeth, five on the tongue, nine on the palate, 17 in the oropharynx and three in a generalized form.\(^\text{[19]}\)

For the treatment of these diseases Ayurveda advocates procedures such as oral cleansing, extractions, excisions, flap surgeries etc., Along with the treatment of orofacial diseases, Ayurveda recommends some daily use therapeutic procedures for the prevention of and maintenance of oral health. These include: Dant Dhavani (Brushing), Jirva Lekhana (Tongue scrapping) and Gandusha (gargling) or oil pulling and tissue regeneration therapies. Some of the scientifically proven beneficial effects of these procedures are described below:

- **Dant Dhavani** (brushing): Ayurveda recommends chewing sticks in the morning as well as after every meal to prevent diseases. Ayurveda insists on the use of herbal brushes, approximately nine inches long and the thickness of one’s little finger. These herb sticks should be either “kashaya” (astringent), “katu” (acrid) or “itika” (bitter) in taste. The method of use is to crush one end, chew it and eat it slowly.\(^\text{[20]}\) The neem (margosa or Azadirachta indica) is a famous herbal chewing stick. Fresh stems of liquurrea (Glycyrrhiza glabra), black catechu or the catech tree (Astracia Catechu Linn.),\(^\text{[21]}\) Arjuna tree (Terminalia arjuna), fever nut (Caesalpinia bonduc) and milkweed plant (Calotropis procera)\(^\text{[22]}\) can also be used for brushing. Chewing on these stems is believed to cause attrition and leveling of biting surfaces, facilitate salivary secretion and possibly, help in plaque control while some stems have an anti-bacterial action.\(^\text{[22]}\) Present-day research has shown that all the chewing sticks described in ancient Ayurveda texts (Circa 200 BC) have medicinal and anti-cariogenic properties.\(^\text{[23]}\)

- **Jirva Lekhana** (tongue scrapping): It is ideal to use gold, silver, copper, stainless steel for the scrapping of the tongue. Tongue scrapping stimulates the reflex points of the tongue. Removes bad odor (halitosis). Improves the sense of taste, stimulate the secretion of digestive enzymes. Removes millions of bacteria growth (approximately 500 varieties) Clinical evidence also shows that use of tongue scrapers on a regular basis, has a significant Improvement on eliminating anaerobic bacteria and decreases bad odor.\(^\text{[24]}\)

- **Gandusha** (gargling) or oil pulling: Oil pulling is an ancient Ayurveda procedure that involves swishing oil in the mouth for oral and systemic health benefits. It is mentioned in the Ayurvedic text Charak Samhita where it is called Kavala or Gandusha and is claimed to cure about 30 systemic diseases ranging from headache, migraine to diabetes and asthma. Oil pulling has been used extensively as a traditional Indian folk remedy for many years to prevent decay, oral malodor, bleeding gums, dryness of throat, cracked lips and for strengthening teeth, gums and the jaw.\(^\text{[25,26]}\) Oil pulling therapy can be done using oils like sunflower oil or sesame oil.\(^\text{[27]}\) Oil pulling therapy is very effective against plaque induced gingivitis both in the clinical and microbiological assessment.\(^\text{[28,29]}\)

- **Tissue regeneration therapies**: In Ayurveda, the well-known herb, Amla (Phyllanthus emblica) is considered a general rebuilder of oral health. Amla works well as
Ayurvedic herbs with various oral health related properties

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. Various plants and natural products have been used for their pharmacological applications viz. antiulcer, genic, wound healing, anti-inflammatory, antimicrobial, antioxidant properties etc. In this section, we have tried to review the recent studies undertaken to use of natural products for oral diseases and also have looked into the multitude prospects and perspectives of Ayurveda in the management of orofacial diseases. Various clinical implications of commonly used Ayurvedic herbs in the management of orofacial diseases are summarized in Table 1.

Table 1: Plants with their oral health related indications

| Plants and their scientific use for oral health |
|-----------------------------------------------|
| *Amalia* (*Emblica officinalis*): It has an antioxidant as well as astringent property which has been proven to be effective in the treatment of toothache, gingival inflammations, and other types of mouth ulcers |
| *Anar/Dalima* (*Punica granatum*): Topical applications of pomegranate preparations have been found to be particularly effective for controlling oral inflammation as well as bacterial and fungal counts in periodontal disease and *Candida*-associated denture stomatitis. The ellagitannin, punicalagin, is thought to be responsible for pomegranate’s antibacterial activity |
| *Launga/Clove* (*Syzygium aromaticum*): Clove oil is commonly used to relief pain of dental caries. *Eugenol* is considered as an active component (including beta Caryophyllene). *Eugenol* is also widely used in conjuction with root canal therapy, temporary fillings and general gum pain, dental abscesses and in other gum diseases |
| *Datiwan* (*Alucita bidentata*): *Datiwan’s* stem and leaves are mainly used. The root juice is used in Nepal for the treatment of toothache. The stem of the plant is used as a toothbrush and is said to be good in the treatment of pyorrhoea |
| *Gota kola* (*Centella asiatica*): It is effective in the treatment of mouth ulcers. It is known to heal wounds and promote connective tissue growth. Asiatic acid and hypaphorine are believed to be responsible for this action. According to Sastravaha et al., *Centella asiatica* showed a significant improvements in decreasing plaque, periodontal pocket depth and attachment level at 3 months |
| *Grita Kumari* (*Aloe vera*): It has unexpectedly shown an interesting property of dentin formation. Jittapiromsak et al. investigated the effect of acemannan (extracted polysaccharide of aloe vera) on dentin formation. In this, PDPCs were treated with acemannan. The results revealed that acemannan significantly increased pulp cell proliferation, BMP-2, ALPase activity, DSP expression and mineralization. The acemannan-treated group also exhibited a complete homogeneous calcified dentin bridge and good pulp tissue organization; the data suggested that acemannan promotes dentin formation by stimulating PDPCs proliferation, differentiation, extracellular matrix formation and mineralization |
| *Guduchi* (*Tinospora cordifolia*): It has an anti-inflammatory, antioxidant, immune-modulator, properties. A significant difference was observed in a study with respect to improvement in salivary flow and in reduction in severity of mucositis in radiotherapy patients thus proving the role of *guduchi* as a radioprotector |
| *Jasmine* (*Jasminum grandiflorum*): The leaves are used in the treatment of odontalgia, fixing loose teeth, ulcerative stomatitis and oral wounds. The leaves also possess a potential antiulcer activity, which may be attributed to its antioxidant mechanism of action. Thus may be tried in the treatment oral ulcers |
| *Kantakari* (*Solunum xanthocrum*): *Dhoopana* with seeds of *kantakari* has been used for treatment of dental caries. This anti caries activity is attributed to the chemical constituents such as solancarpine, carp Esther, solancarpidine, solasodine, solasonine and solamargin |
| *Nimbu* (*Lemon*): Lemon solution is a natural source of citric acid (pH 1.68) with lower acidity. Because of its wide anti-bacterial efficiency (including *Enterococcus faecalis*), a freshly prepared lemon solution is recommended as a root canal medicament |

**CONCLUSION**

Oral diseases are one of the most important problems in public health and are on the rise in developing countries. Most of the oral diseases are caused due to the bacterial infections. The anti-bacterial activity of medicinal plants are due to the presence of potential bioactive compounds, which help to reduce bacterial load in the oral cavity and thus prevent the formation of plaque, dental caries and ulcers. Use of indigenous plants in oral health and hygiene has a long history in different parts of the world. Therefore, this knowledge is likely to vanish soon as many of these ethno-phthoerapeutic remedies are followed only by a few in rural areas. New generation is ignorant of this traditional knowledge. Because of younger generation’s lack of knowledge on the identification, collection, preservation and processing of the plant species for medicinal use it is therefore very crucial to conserve these ethnno-cultural practices before they are lost definitively.

In this paper, an attempt has been made to review various herbal plants mentioned in Ayurveda that can be used as an adjunct for the maintenance of oral health. The literature showed that there are numerous Ayurvedic drugs, which can be used in prevention as well as management of oral diseases. Many Ayurvedic herbal plants, which are reviewed, possess antimicrobial, anti-inflammatory, analgesic, antiulcer, genic activities when screened according to the modern parameters. However, among them very negligible amount of herbs...
extracts are used in clinical practice and the rest of others are not practiced because of their unknown toxicological effects. The clinical studies should be encouraged to assess the efficacy as well as toxicity of herbal drugs.

The traditional knowledge of Ayurveda should be integrated with the modern dentistry. For this, the active principles of plants should be incorporated into modern oral health-care practices and dentists should be encouraged to use natural remedies in various oral health treatments. This will make dentistry much safer, affordable and more accessible for the lower socio-economic groups in society.

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