

Horizon of Ayurved and Modern Dentistry: A Review

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Mini Review

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Abstract

Background: Oral infections and dental diseases are still considered as serious public health problem despite of the advances in various field of medicine, and inflict a major burden to health care services around the world and especially in developing countries. Development of resistance against antibiotics and antiseptics is a growing cause of concern which has limited the preventive measures. Several commercially available allopathic medicines can alter oral microflora and have undesirable side effects, thus making alternative medicine important to maintain disease free oral health. Hence, the search for alternative products continues and plant extracts used in traditional medicine (ayurveda) are considered as good alternative to allopathic medicine. Aim: to study and determine various applications of ayurved products and herbs in oral health care.

Objective: To bring about an understanding regarding integration of dentistry and ayurved.

Material & Method: A PUBMED, MEDLINE, Medknow literature search was conducted using keywords Ayurveda, dentistry, oral health, Oil pulling, integration Apart from indexed journals, peer reviewed and non-indexed journals were also reviewed.

Result: Traditional medicine can treat various infectious and chronic conditions. Research has shown that all kinds of chewing sticks described in ancient Ayurveda herbs have medicinal and anti-cariogenic properties. Its oil pulling (Kaval, Gandush) practice is claimed to cure gum diseases. Amla is a general builder of oral health. Bilberry fruit and hawthorn berry stabilize collagen, strengthening the gum tissue. Liquorice root promotes anti-cavity action, reduces plaque, and has an antibacterial effect. The Jalandhar bandha is effective painless tooth extraction.

Conclusion: The traditional knowledge of the Ayurved should be integrated with modern dental practice and encouraged to use ayurved preparations and herbal product in various oral lesion and diseases.

Keywords: Ayurved; Dentistry; Oral Health; Herbs; Oil Pulling; Integration

Introduction

Oral disease is a major health problem worldwide and still considered as serious public health problem despite of the advances in various field of medicine [1,2]. The global need for ayurvedic alternative prevention and treatment options are safe, effective, economical and feasible. Currently many pathogens have developed resistance to currently used antibiotics against antibiotics, antiseptics and chemotherapeutics and some opportunistic infections in individuals with compromised immune system [2,3]. Despite several chemical agents commercially available, can alter oral microflora and have undesirable side effect such as vomiting, diarrhea and tooth staining [4]. It has been well documented that medicinal plant have considerable antibacterial property against various microorganisms and bacteria responsible for dental caries [5,6]. Even though dentistry was not a specialized branch of Ayurveda, it was included in its Shalaky Tantra which is a system of surgery. In ancient India, problems such as deformities of the oral cavity, plaques and infections could be managed and even cured [7]. Nowadays there is a raised demand towards the usage of various ayurvedic products and therapies for the management of oral diseases, due to their Anti-inflammatory, Antimicrobial, Antioxidant properties [8]. In this paper, an attempt has been made to review various ayurvedic herbal products and procedures that can be used in prevention as well as management of oral diseases.

Aim

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Concept of Health in Ayurveda

According to *Sushruta Samhita*, health can be defined as “the equilibrium of the three biological humors (*doshas*), the seven body tissues (*dhatu*s), proper

digestion and a state of pleasure or happiness of the soul, senses and the mind [9].” A balance among the three *Doshas* is necessary for health. When their actions in our mind-body constitution are balanced, one experience psychological and physical wellness. When the balance is disturbed, symptoms of sickness are observed and experienced in an individual [10,11].

Ayurved and Dentistry

In Ayurveda, dental health (*Danta Swasthya*) is considered to be very individualistic, varying with each person's constitution (*Prakriti*), and climatic changes resulting from solar, lunar and planetary influences (*Kala-parinama*) [12]. The branches of Ayurveda viz, *Shalyatantra* and *Shalakyatantra* 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. 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), *Jivha Lekhana* (Tongue scrapping) and *Gandoosha* (gargling) or oil pulling and tissue regeneration therapies. Some of the scientifically proven beneficial effects of these procedures are described below:

Dant Dhavani (Brushing Sticks)

Chewing sticks in the morning as well as after every meal to prevent oral diseases is recommended in ayurveda. Plant sticks (brush), approximately nine inches long and the thickness of one's little finger. One end of it is crushed and chewed to make them like bristle of tooth brush and then rubbed on teeth surface. These herb sticks should be either “*kashaya*” (astringent), “*katu*” (acid) or “*tikta*” (bitter) in taste [13]. 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 [14]. Most famous among herbal chewing stick is the *neem* (*margosa* or *Azadirachta indica*). Fresh stems of *liquorice* (*Glycyrrhiza glabra*), *black catechu* or the *cutch tree* (*Acacia Catechu* Linn.), *Arjuna* tree (*Terminalia arjuna*), *fever nut* (*Caesalipinia bouduc*) and *milkweed plant* (*Calotropis procera*) can also be used for brushing [15]. The chewing sticks described in ancient *Ayurveda* texts (Circa 200 BC) have medicinal and anticariogenic properties which is also proved in modern day research [16].

Jivha Lekhana (Tongue Scrapping)

It is U shaped metal strip 4-5 cm width with handle to hold. It is ideal to use metals like gold, silver, copper; stainless steel for the scrapping of the tongue. It is used to scrape the dorsal surface of the tongue (jivha). Tongue is protruded out of mouth and scrapped from posterior (inside) to anterior (outside) to clean the surface. Tongue scrapping stimulates the reflex points of the tongue. Removes bad odour (halitosis). Improves the sense of taste, stimulate the secretion of digestive enzymes. Removes millions of bacteria flora present on tongue surface. Clinical evidence also shows that use of tongue scrapers on a regular basis, has a significant Improvement on eliminating anaerobic bacteria and decreases bad odour [17].

Oil Pulling or Gandusha (Gargling)

Charaka Samhita describes Oil pulling as one of the method for maintaining oral health. It is also called as *Kavala* or *Gandusha*. Oil pulling is an ancient Ayurveda procedure that involves swishing oil in the mouth for oral and systemic health benefits and is claimed to cure about 30 systemic diseases ranging from headache, migraine to diabetes and asthma. It has been used as a traditional Indian tribal medicine for many years to prevent decay, halitosis, bleeding gums, dryness of throat, cracked lips and for strengthening teeth, gums and the jaw [18,19]. Oil pulling therapy can be done using oils like sunflower oil or sesame oil [20]. Oil pulling therapy is very effective against plaque induced gingivitis both in the clinical and microbiological assessment [21,22]. Sesame seed oil is used most commonly because of several medicinal properties and desirable health benefits. Occasionally sunflower oil is also used. Exact mechanism of the action of oil pulling is not known. It is claimed that swishing of oil in the mouth activates enzymes and draws the toxins out of blood. Sesame seed oil has a high concentration of polyunsaturated fatty acids which are good source of fat soluble vitamins [23,24]. Antioxidants present in the sesame are sesamin, sesamol and sesaminol. These lignans have certain actions on the living tissues like detoxification of toxins, antioxidant effect, potentiates the action of Vitamin-E. Sesamin has found to inhibit the absorption of cholesterol as well as its production. In the liver reduces lipogenesis and antibiotic effect in that it helps in the destruction of microorganisms [24]. A few studies were found in the literature which highlights the role of oil pulling therapy in the maintenance of oral health. Oil pulling therapy with sunflower oil significantly reduced plaque scores after 45 days. Oil pulling therapy was effective against plaque induced gingivitis both in microbiological and clinical assessment. The viscosity of

the oil probably inhibits bacterial adhesion and plaque co-aggregation. Other possible mechanism may be saponification process that occurs as a result of alkali hydrolysis of fatty acids. Significant reduction in *Streptococcus mutans* count in saliva and plaque after oil pulling therapy which in turn will reduce the incidence of dental caries. It has also known to prevent halitosis, xerostomia and angular cheilitis. Emulsification greatly enhances the surface area of the oil, thereby increasing its cleansing action. Sesame oil is relatively high in unsaponifiable substances. The unsaponifiable fraction can probably protect the oral cavity from infection and inflammation by its antioxidant property [25].

Tissue Regeneration Therapies

In *Ayurveda*, the well-known herb, *Amla* (*Phyllanthus emblica*) is considered a general builder of oral health. *Amla* works well as a mouth rinse as a decoction. One to two grams per day can be taken orally in capsules for the long-term benefit to the teeth and gums. *Amla* supports the healing and development of connective tissue when taken internally [26]. Regular use of *Bilberry* and *hawthorn berry* fruits stabilize collagen and strengthens the gum tissue [27]. *Liquorice* root promotes anti-cavity action, reduces plaque and has an anti-bacterial effect [26]. Herbs such as *yellow dock root*, *alfalfa leaf*, *cinnamon bark* and *turmeric root* are taken internally to strengthen *Astidharu*, for example, the skeleton and the joints, have proven to be good for long term health of teeth [27].

Herbs used in Dentistry

Turmeric (Curcumin longa, Haldi)

Is useful for applying to the tooth surface for the prevention and reduction of dental caries. Dental Plaque detection system. Turmeric water used as a mouth rinses (boil 5 g of turmeric powder, two cloves, and two dried leaves of guava in 200 g water) gives instant relief from dental pain. Other various oral health diseases are treated using turmeric products such as gum diseases (gingivitis and periodontitis), as a pit and fissure sealant, to strengths the teeth and due to its specific anticancer activity, used to treatment potentially malignant disorders such as oral submucous fibrosis, leukoplakia and oral lichen planus [27,28]. Curcumin oil used for the management of recurrent aphthous ulcers [29].

Ginger (Adraka, Sunti, Zingiber officinale,)

Ginger is used in eliminating toothache. It is partially burnt, mixed with common salt and placed in close vicinity of aching tooth. It is also having mild anti-inflammatory property [30].

Garlic (*Allium sativum* L, Lahsun)

Garlic has been found to have antibacterial, antiviral and antifungal activity. It is effective against most dental infections.

Aloe Vera

Both topical and oral treatments with Aloe vera were found to have a positive influence on the synthesis of glycosaminoglycans (GAGs), thereby beneficially modulate wound healing. It has shown an interesting property of dentin formation. Acemannan (aloe vera extract) is helpful in proliferation of pulp cells and also promote dentin formation, differentiation, extracellular matrix formation and mineralization.

Guggul (*Commiphora Mukul*, Indian Bdellium Gum, Guggulipid)

It was traditionally combined with other herbs for the treatment of arthritis, skin diseases, and pains in the nervous system, obesity, digestive problems, infections in the mouth, and menstrual problems.

Amala (*Emblica Officinalis*)

It has antioxidant as well as astringent property which has been proven to be effective in treatment of toothache, gingival inflammation, aphthous stomatitis and other type of mouth ulcers.

Anar/Dalima (*Punica granatum*)

Topical application of pomegranate preparation have been found to be particularly effective for controlling oral inflammation as well as bacterial and fungal counts in periodontal diseases and candida associated denture stomatitis. The ellagitanin, punicalagin, is thought to be responsible for pomegranate's antibacterial activity [30-32].

Launga/Clove (*Syzgium aromaticum*)

Clove oil commonly used to relief pain in dental caries. Eugenol is considered as an active component (including beta caryophyllene) Eugenol is also widely used in conjunction with root canal therapy, temporary filling and general gum pain, dental abscess, 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 tooth brush and is said to be good in the treatment of pyorrhoea.

Gotu kola (*Centella Asiatica*)

It is effective in the treatment of mouth ulcer. It is known to heal wounds and promote connective tissue growth. Asiaticoside and hypaphorine are believed to be responsible for this action. Centella asiatica showed a significant improvement in decreasing plaque, periodontal pocket depth and attachment level at three months.

Guduchi (*Tinospora cordifolia*)

It has an anti-inflammatory, antioxidant, immunomodulator properties. It improves salivary flow and reduces the severity of mucositis in patients undergoing radiotherapy, thus has a role as a radioprotector.

Kantakari (*Solanum xanthocarpum*)

Dhoopana with seeds of kantakari, has been used for treatment of dental caries. This anti caries activity is attributed to the chemical composition such as Solanocarpine, carpesterol, solanocarpidine, solasodine, solasonine, solasonine.

Lemon /Nimbu

Lemon solution is a natural source of citric acid. With lower acidity because of its antibacterial property, a freshly prepared lemon solution is recommended as a root canal medicament.

Mango/aam

Mango leaf contains ascorbic and phenolic acid. Mango leaves possess antibacterial properties against anaerobic dental microflora and can be effectively used as adjunct for maintenance of oral hygiene.

Neem

Antibacterial, antifungal, antiviral, antioxidant, anti-inflammatory, analgesic, immune stimulant property of neem are well established. Antiplaque activity of neem stick is well known. Mouth rinse prepared from neem leaves is effective against periodontitis.

Orange

Orange oil is used in gutta-percha softening and in dissolving endodontic sealer.

Rumi mastagi/mastic gum

Used as a remedy for halitosis.

Tila /sesame

Used in oil pulling therapy reduces plaque index in treatment of gingivitis [28].

The various other herbal products and their medicinal uses in the management of oral diseases are mentioned below [29] (Table 1).

Herb/plant extract	Medicinal Action/Properties	Use in Dentistry
<i>Asgand (with aniasomnifera)</i>	Anti-anxiety	Management of the patients with dental anxiety
<i>Aloe Vera</i>	Anti-bacterial	Management of oral lichen planus
<i>Babul (Acacia arabica wild)</i>	Antibacterial activity against <i>P. gingivalis</i> and <i>P. intermedia</i>	Management of the gum diseases
<i>Clove oil (Syzygium aromaticum)</i>	Antiseptic, analgesic and antimicrobial.	Toothache, gum diseases and mouth ulcers.
<i>Nilgiri/ Eucalyptus (Eucalyptus Globules)</i>	Antibacterial	Management of periodontal diseases
<i>Garlic (Allium Sativum, Liliaceae)</i>	Antibacterial, Antiviral and Antifungal	Dental infections
<i>Haldi/Turmeric (Curcuma longa)</i>	Antibacterial, Antiviral and Antifungal, It suppresses metastasis of melanoma cells, and deactivates the tobacco containing carcinogens	For the management of dental pain, periodontal diseases, dental plaque detection, used as pit and fissure sealant, for the treatment of potentially malignant disorders of oral lesions.
<i>Honey (Apis Mellifera)</i>	Antibacterial, Anti-inflammatory and Immunostimulator	Management of oral ulcerative lesions.
<i>Jasmine (Jasminum)</i>	Antioxidant, Anti-ulcerogenic	Treatment of Odontalgia, periodontitis, ulcerative stomatitis, Skin lesions, Ulcers.
<i>Katha (Acacia catechu wi)</i>	Analgesic, Antibacterial, Anti-ulcer, and Antipyretic	Management of wound healing, gingivitis, dental caries, tonsillitis, & halitosis.
<i>Olive oil (Olea europaea)</i>	Antibacterial	management of periodontal diseases
<i>Pomegranate (Punica granatum)</i>	Antioxidant	Management of bleeding gums caused due to scurvy
<i>Piper cubeba (Piperaceae)</i>	Antibacterial & Anti cariogenic	To prevent dental caries
<i>Nettle (Urtica dioica)</i>	Analgesic	2-3 drops of root extract are applied to hollow tooth cavities to treat toothache
<i>Tulsi leaves (Ocimum sanctum),</i>	Antibacterial	prevents dental plaque, gingivitis and bad breath

Table 1: Herbal products and their medicinal uses in the management of oral diseases.

Conclusion

The traditional knowledge of the ayurveda should be integrated with modern dental practice and encouraged to use herbal products in various oral disease treatments. Dentists are now becoming aware about the advantages of ayurved herbs and procedures and are on the horizon of integration with ayurved. Most of the integrated researches are at basic level of trial and error basis. Improper usage of herbal products may lead to harmful effects and adverse reactions. To prevent, this awareness training, programmes about safe usage of herbal products should be conducted and more research and use of

ayurved in dentistry .There is a need for integration of professional dental treatment modalities and Ayurved to provide the best and unique from each system to patients as a complementary therapy and an alternative choice of treatment.

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