



AYURVEDIC APPROACH IN ORAL HEALTH & HYGIENE: A REVIEW

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ABSTRACT

Oral diseases continue to be a major health problem world-wide with the incidence of oral cancer and other disorders are on the rise in developing countries. Oral health also reflects the body health. For prevention and the treatment of oral diseases, modern medicine has had only limited success. There is a global need for safe and effective alternative prevention and treatment. Ayurveda is good alternative for that and may lead to the development of novel preventive or therapeutic strategies for oral health. This 5000-year-old system of medicine not only recommends treatments with specific herbs and minerals to cure various oral diseases but also recommends some daily use therapeutic procedures for the prevention of and maintenance of oral health.

Recently, there is renewed interest in use of Ayurvedic drugs for oral health. Various Ayurvedic herbs and natural products have been used for their pharmacological applications viz. antiulcer, wound healing, anti-inflammatory, antimicrobial and antioxidant properties and have been proven to be safe and effective for oral disease and hygiene including various therapeutic Ayurvedic procedures. Scientific validations of the Ayurveda oral health practices could justify their incorporation into modern oral care. In this paper, an attempt has been made to scientific evidence based review various therapeutic procedures for the prevention and maintenance of oral health and hygiene mentioned in Ayurveda.

KEYWORDS: Ayurveda, Oral health and hygiene, *Dantapavan, Kavala, Gandoosha.*

INTRODUCTION

Oral diseases are one of the most important problems in public health and are on the rise in developing countries. 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. 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.^[1] Oral health also reflects the body health.

There is evidence that oral biofilm-associated diseases may affect systemic health by mechanisms such as spreading infections to adjacent tissues and spaces, hematogenous dissemination of oral biofilm organisms or inflammatory mechanisms.^[2] Further, evidence suggests that oral biofilm-associated chronic periodontitis enhances the risk of coronary heart disease and cerebrovascular disease and that poor glycaemic control in diabetic patients with periodontitis is a concern for clinicians.^[3-5]

Hence the prevention and treatment of oral diseases is not only important for maintenance of good oral health but also for general health. For prevention and the treatment of oral diseases, modern medicine has had only limited success. Oral hygiene is the practice of keeping the mouth and teeth clean for dental health and to avoid bad breath. Tooth brushing, dental floss, toothpicks

and gargling are main techniques for oral hygiene in modern science.

Oral health care professionals need to put home oral hygiene at the priority of their advice on preventive practice. There are umpteen numbers of indigenous natural medicinal products which deserve recognition for their contribution in the improvement of oro-dental health.^[6] Various plants and natural products have been used for their pharmacological applications viz. antiulcer, wound healing, anti-inflammatory, antimicrobial and antioxidant properties etc.^[7]

Ayurveda is good alternative for that and may lead to the development of novel preventive or therapeutic strategies for oral health. This 5000-year-old system of medicine not only recommends treatments with specific herbs and minerals to cure various oral diseases but also recommends some daily therapeutic procedures for the prevention and maintenance of oral health and these have been proven to be safe and effective. Recently, there is renewed interest in use of various Ayurvedic drugs and therapeutic procedures for oral and dental health.

Bacterial infections are considered as causative factors in most of the dental diseases and it has been well-documented that Ayurvedic medicament produce considerable antibacterial activity against microorganisms, including bacteria responsible for periodontitis and dental caries.^[8]

Ayurveda recommends and insist on the use of herbal brushes. Chewing sticks have been widely used in the Indian subcontinent, the Middle East and Africa since ancient times. *Dattuna* can be a good alternative to the toothbrush as a means of preventing oro-dental diseases. It is suitable for cleaning the teeth; costs little, possess various medicinal properties and are easily available in the rural areas of developing countries including India. It is also an oral hygiene tool that requires no expertise or special resources for its production and marketing.^[9]

The cost of *Ayurveda* is much lower, it is closer to the community, and patients get personal attention or the healing touch of the practitioner who speaks the same language. According to World Health Organization (WHO) 75% of the world's population uses herbs for basic health care needs. WHO has recommended for the incorporation of the traditional systems of medicine like Ayurveda into the primary health care system, for those communities where it is accepted. All the Ayurvedic medicines and local remedies are easily available in the rural areas where socioeconomic condition of the people is not good enough to buy costly toothpaste or curative medicines. *Ayurveda* must be reinterpreted in the light of our new knowledge and it must be incorporated in modern medicine along with other forms of traditional medicine.^[10]

Ayurveda and Orofacial diseases

Among the eight branches of Ayurveda, *Salakya-tantra* branch explains the treatment of ailments affecting eyes, ear, nose, mouth, etc. and mentioned 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.^[11]

Ayurveda recognizes nine openings of physical body and oral cavity as one of them.

It suggests cleaning these openings frequently and regularly. Hygiene of oral cavity is more important due to the chief entrance and digestion process begins in the mouth itself. Oral cavity includes the *Oshtha* (lips), *Dantamoola* (gingiva and tooth supporting structures), *Danta* (teeth), *Jihva* (tongue), *Talu* (palate), *Kantha* (throat) and *Sarvasara* (oral mucosa). For the treatment of these diseases Ayurveda advocates procedures such as oral cleansing, extractions, excisions, flap surgeries etc.

Ayurveda and Oral hygiene

Ayurveda emphasis upon the maintenance and promotion of positive health which is its primary objective whereas cure of diseases are only secondary. *Ayurveda* includes the preventive health care in "*Swasthya Samrakshana*". It well explains the importance of hygiene. For the maintenance and promotion of positive health, several regimens are prescribed in *Ayurveda* which include, *Dinacharya* (daily routines), *Ratricharya* (night regimen), *Ritucharya* (seasonal regimen), *Sadvritta* (right conduct of life), *Achara Rasayana* (behavioral conducts). The regimens which should be followed every day is known as *Dinacharya* in *Ayurveda* which includes oral hygiene, food hygiene, personal hygiene etc. Under the *Dinacharya* (daily routines) various procedures for maintaining oral hygiene are well explained in all classical texts of *Ayurveda*. These include procedures like *Danta-*

dhavana (brushing the tooth), *Pratisarana* (Massaging the teeth and gums), *Jivha nirlekhana* (tongue cleaning), *Gandoosha* and *Kavala* (gargling) etc.

Oral hygiene is not described as a separate chapter in Ayurveda but it comes under the different chapters of Ayurvedic literature. *Acharya Charak* described it under the topic "*Swasthyavrata*" which means personal hygiene in "*Mattrashitiyaadhyaye*". *Acharya Sushruta* had told about oral hygiene in the "*Anagatabhadapratishe*" chapter, while *Acharya Vagbhata* described it in "*Dincharya*" chapter. All the authors have given emphasis on personal hygiene which should be followed by each individual strictly.^[12]

Dantapavan/ Dattuna (Chewing sticks/brushing teeth)

Brushing of teeth helps to remove dental plaque and tartar from teeth to prevent cavities, gingivitis, and gum disease.

According to Ayurvedic texts, it is recommended that *Dattuna* (Chewing Sticks) in the morning as well as after every meal prevents oral diseases. The method of use is to crush one end, chew it and brush with it slowly. It is better to take from fresh plant. The stems used for *Dantapavan* should be healthy, soft, without leaves and knots. After cleaning the teeth with *Dattuna* it is torn into two parts and used to scrap the tongue coatings. According to *Acharya Sushruta*, *Dantapavan* should be fresh and straight. Its length should be 12 *Angul* (9 inches), while thickness should be equal to *Kanshtika anguli* (little finger).^[14] These herb sticks should be either *Kashaya* (astringent), *Katu* (pungent), or *Tikta* (bitter) in *Rasa*.^[15] *Acharya Sushruta* also includes *Madhura rasa*.^[16]

Various recommended plants are *Neem* (*margosa* or *Azadirachta indica*), Fresh stems of *Yastimadhu* (*Glycyrrhiza glabra*), *Arjuna* tree (*Terminalia arjuna*), *Vata* (*Ficus bengalensis*), *Vijaysara* (*Pterocarpus marsupium*), *Arka* (*Calotropis gigantea*), *Khadira* (*Acacia catechu*), *Karanja* (*Pongamia glabra*), *Karaveera* (*Nerium indica*), *Arimeda* (*Acacia farnesiana*), *Apamarga* (*Achyranthus aspera*), *Malathi* (*Jasminum grandiflorum*) or such other known herbs which possess the above mentioned tastes should be used. ^[17] *Acharya Sushruta* suggested that *Nimba* (*Azadirachta indica* A.juss) is better among bitter ones, *Khadira* (*Acacia catechu* Linn.f) among Astringent ones, *Karanja* (*Pongamia glabra* Vent) among pungent ones and *Madhuka* (*Bassia longifolia* Koen) among sweet ones. ^[18]

Various plants those are not suitable for brushing are also mentioned in Ayurveda as follows.

Twigs of *Sleshmathaka* (*Cordia dichotoma*), *Arishta* (*Sapindus trifoliatus*), *Bibhithaka* (*Terminalia bellerica*), *Dhava* (*Anogeissus latifolia*), *Dhanwan* (*Grewia tiliifolia*), *Bilwa* (*Aegle marmelos*), *Nirgundi* (*Vitex negundo*), *Sigru* (*Moringa oleifera*), *Tilwaka* (*Simplocus racemosus*), *Tinduka* (*Diospyros melanoxylon*), *Kovidara* (*Bauhinia variegata*), *Sami* (*Accacia suma*), *Pilu* (*Salvadora persica*), *Pippali* (*Piper longum*), *Ingudi* (*Puthranjiva roxburgh*), *Guggulu* (*Commiphora mukul*), *Paribhadra* (*Erythrina indica*), *Amlika* (*Tamarindus indica*), *Salmali* (*Bombax ceiba*), *Palasa* (*Butea monosperma*) and *Sana* (*Crotalaria retusa*) should not be used as *Dattuna* (Chewing Sticks). *Dattuna* is contraindicated in pathological conditions like facial paralysis, mouth ulcers, heart diseases, some eye and

ENT disorders. For these conditions Ayurveda recommends the use of soft and fine powders of drugs for cleaning the teeth.

The benefit of *Dantpavan* is to get rid from bad odour of mouth along with increase interest towards food due to removal of *Mala* from tooth, tongue and mouth.^[19]

Research has shown that *Dattuna* (chewing sticks) described in ancient *Ayurveda* literature, have medicinal properties and have the role in the maintenance of oral health.

Chewing on these stems is believed to cause attrition and levelling of biting surfaces, facilitate salivary secretion and possibly help in plaque control while some stems have an anti-bacterial action.^[20] Present day research has shown that all the chewing sticks described in ancient *Ayurveda* have medicinal and anti-cariogenic properties.^[21]

Neem (*Azadiracta indica*) is most commonly used herb for *Dattuna* all over the India. Some studies are done on *Neem* (*Azadiracta indica*) related to tooth brushing are as follows.

Saimbi et al. (1994) have reported that *Neem* extract had significant and higher antiplaque efficacy as compared to *Ayurvedic* tooth powder and commercial toothpastes.^[22] Venugopal et al. had found that the children (1-4 year of age) using *Neem* were less affected with dental caries. *Neem* contains the alkaloids margosine, resins, gum, chloride, fluoride, silica, Sulphur, tannins, oils, saponins, flavonoids, sterols and calcium.^[23] Khalid (1999) examined the antimicrobial activity of aqueous extract of *Neem* at various concentration and found antimicrobial activity at all the concentrations.^[24] Vanka et al. (2000) conducted a study to know the effect of indigenous *Neem* (*Azadiracta indica*) mouthwash on *S. mutans* and lactobacillus growth. Initial data of the study revealed that it has inhibiting effect on *S. mutans* which has reversed incipient carious lesions.^[25] Baswa et al. (2000) conducted a study which revealed that *Neem* oil have bactericidal activity independent of the temperature and energy. The activity was mainly due to the inhibition of cell-membrane synthesis in the bacteria.^[26]

Another study done on mango leaves as an oral hygiene aid done by Summant et al. (1992) and found higher soft deposit score compared to toothbrush with significant findings. Caries experience in the group using mango leaf was similar to that using tooth brush which shows the effectiveness of mango leaves. Mango leaves contain mangiferin a compound which had significant antibacterial property against certain stains of streptococci, staphylococci, pneumococci and lactobacillus acidophilus. *Mangifera indica* contains tannins, bitter gum and resins. At higher concentration extract of mango chewing sticks showed more antimicrobial activity which could be due to the contents in mango extract. Tannins and resins supposedly have an astringent effect on the mucous membrane forming a layer over enamel thus providing protection against dental caries.^[27]

Jivha nirlekhana (tongue scrapping)

It is to be done after *Danta pavana* (brushing tooth) using soft tongue scraper or massages over tongue. Tongue scrapping is done gently with a metal scrapper

from root to tip. It is ideal to use gold, silver, copper, stainless steel or branches of the tree for the scrapping of the tongue. Its length should be ten fingers. Its margin should be blunt so that it will not damage the tongue and should be curved so can be use easily.^[28] This stimulates the whole digestive tract and increases the *Agni* (digestive fire).^[29]

It removes millions of bacterial growth (approximately 500 varieties). Clinical evidences show that use of tongue scrapers on a regular basis, has a significant improvement on eliminating anaerobic bacteria and decreases bad odour. Tongue scrapping stimulates the reflex points of the tongue, removes bad odour (halitosis), improves the sense of taste and stimulate the secretion of digestive enzymes.^[30-32]

Pratisarana (Massaging the teeth and gums)

Pratisarana is done with paste or powder of herbs or by honey/oil with herbal powder. It can be apply with fingers and rubbed gently on teeth and gums with fine powder of *Vapya* or *Kushta* and three groups of three drugs - *Triphala*, *Trikatu* and *Trijata* mixed with honey. This process removes the food debris and plaque and helps to maintain the periodontal health. According to *Acharya Sushruta Dattuna* dipped in *Madhu*, *Trikathu*, *Trivargha*, oil and *Saindhavlavana* can be used as tooth powder. Recent researches has proved gum massage is good for dental and oral hygiene. some of the studies on this are as follows.

Suchetha et al. (2013) conducted a study for the effectiveness of Periocare® gum massage powder containing *C. zeylanicum*, *Piper nigrum*, *E. caryophyllata*, *G. glabra*, and *R. cordifoliac* in Ayurvedic formulae shows reduction in plaque scores, gingival score, aerobic CFUs, and anaerobic CFUs, revels significant result with mechanical plaque control.^[33]

Indeed, recent research shows that turmeric extract and turmeric oil may even reverse precancerous changes in oral submucous fibrosis in humans.^[34] The active constituent of turmeric is known as curcumin, which has been shown to have a wide range of therapeutic effects.^[35] Another study (done by cikrikci et al. 2008) revealed that applying a paste made from 1 tsp of turmeric with ½ tsp of salt and ½ tsp of mustard oil provides relief from gingivitis and periodontitis. It is recommended to rub the teeth and gums with this paste twice daily.^[36] A pilot study (done by Suhag et al, 2007) conclude that 1% curcumin solution causes resolution of inflammatory signs better than Chlorhexidine and saline irrigation as a subgingival irrigant.^[37]

Kavala and Gandoosha (Oil pulling)

The difference between the two is only in the dosage and procedure of using the drug. In *Gandoosha*, the oral cavity is filled completely with liquid medicine, held for specific period until there is lacrimation and nasal discharge and then spit out. Normally it is about 3-5 minutes. In *Kavala Graha*, a comfortable amount (three-fourths filled) of medicated fluid is retained with the mouth closed for a specific time (about 3 minutes), gargled and then spit out.^[38]

Four types of *Kavala* is mentioned in Ayurveda according to their effect as *Snaihika* (lubricating effect),

Samana (mitigating effect), *Sodhana* (purificatory) and *Ropana* (healing effect). The benefits of regular *Gandoosha* are *Swarabalam* (strength to voice), *Hanubalam* (strength to jaws), strength to face, *Ruchyam* (better taste perception), *Drudadantha* (strong and healthy teeth), and resistance against *Doshaja* or *Aaganthuja mukharogas*.^[39] *Kavala* and *Gandoosha* (Oil pulling) help in removing the odour, stimulates the taste buds, strengthens the gums and teeth and increases the appetite.^[40]

It can be used to clean the oral cavity in those cases where brushing is contraindicated e.g. mouth ulcer, fever, indigestion, those who have tendency to vomit, asthma, cough, thirst.^[41]

Scientific evidences show that the *Kavala* and *Gandoosha* (Oil pulling) have significant role in the maintenance of oral health. New researches have proved that the oral mucosa does not act as a semi-permeable membrane to allow toxins to pass through. The medicated oil and fluid used in *Kavala* and *Gandoosha* probably protect the oral cavity from infection and inflammation by its antioxidant property. These mechanisms could be probable mode of action for the reduction of plaque scores and colony count of the microorganisms in the oral cavity. The viscosity of used medicated oil probably inhibits bacterial adhesion and plaque co-aggregation.^[12] Oil pulling therapy is very effective against plaque induced gingivitis both in the clinical and microbiological assessment.^[42,43] Study showed that oil-pulling therapy could reduce the plaque index, modify gingival scores and the total oral bacteria count in gingivitis patients.

A study done by Asokan S *et al* (2009) to evaluate the effect of oil pulling with sesame oil on plaque induce gingivitis, and to compare its efficacy with a chlorhexidine containing mouthwash Significant reduction of the pre- and post-values of the plaque and modified gingival index scores in both the study and control groups ($p < 0.001$) was achieved. Total colony count of aerobic microorganisms in the plaque of adolescents also decreases.^[42] According to Prakash *et al* 2014, *Trifala* mouth rinse shows significant result in anti-cariogenic property and reduction in gingivitis and periodontitis.^[44]

CONCLUSION

Ayurveda is a holistic health system which also recommends some daily therapeutic procedures for the prevention and maintenance of oral health. The review of above Ayurveda oral health practices and scientific researches indicates that Ayurveda health promotive, modalities have sound scientific base and these scientific validation could justify their incorporation into modern oral health care. Most of the oral diseases are due to the bacterial infections. Material used in daily oral health care modalities of Ayurveda including medicinal plants have anti-bacterial activity against various microorganisms due to the presence of potential bioactive compounds. These helps to reduce bacterial load in the oral cavity and thus prevent the formation of plaque, dental caries, ulcers and other problems. Many Ayurvedic herbal plants also possess anti-inflammatory, analgesic, anti ulcerative properties. Ayurveda recommends and insist on the use of herbal brushes. *Dattuna* can be a good alternative to the toothbrush as a means of preventing oro-dental diseases. Research has shown that all kinds of *Dattuna* (chewing

sticks) described in ancient Ayurveda texts have medicinal and anti-cariogenic properties. *Kavala* and *Gandoosha* procedures are claimed to cure several systemic diseases. These procedures and herbs costs little, possess various medicinal properties and are easily available.

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