

DANTADHAVANA AN AYURVEDIC APPROACH IN MAINTANCE OF ORAL HEALTH-A REVIEW

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ABSTRACT

Ayurveda, the science of life has been practiced in India from Vedkala. The aim of *Ayurveda* is to maintain the healthy state of an individual and cure of the diseases. 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. modern medicine has had only limited success For prevention and the treatment of oral diseases. There is a global need for safe and effective alternative prevention and treatment. To achieve these goals *Ayurveda* described *Dinacharya* (Daily routine) in detail. *Ayurveda* recommends some daily use therapeutic procedures - Upakrama for the maintenance of oral health. Recently, there is renewed trend in use of Ayurvedic drugs for oral health. Various Ayurvedic herbal 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 of Dantadhavana for the prevention and maintenance of oral health and hygiene mentioned in Ayurveda in context of dental plaque, dental calculus, and malodour.

KEYWORDS: Ayurveda, Oral health and hygiene, Dantadhavana.

INTRODUCTION

Oral health is integral to general well-being and relates to the quality-of-life. 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. 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.^[32,33] 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.^[16]

Ayurveda emphasis upon the maintenance of positive health as is its primary objective. For the maintenance 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 Upakramas- procedures like Danta-dhavana (Brushing the tooth), Pratisarana (Massaging the teeth and gums), Jivha nirlekhana (Tongue cleaning), Gandoosha and Kavala (Gargling)et . 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 in “Matrashitiyaadhyaye”. Acharya Sushruta had told about oral hygiene in the “Anagatabhadapratished” chapter, while Acharya Vagbhatta described it in “Dincharya” chapter.^[1,2] These daily routines have physiological effects on proper functioning of the body thereby maintaining a state of normal equilibrium of three *doshas*, *Sapta Dhatus*, *Mala* and the *Agni*. Ayurveda prescribes *Dinacharya* modalities like *Achmana* (Slipping of water), *Dantadhavana* (Brushing of teeth), *Jihvanirlekhana* (Tongue cleaning) *Kavala* (Swishing)

and *Gandusha* (Gargling) to keep up the health of the oral cavity, prevention and treatment of diseases of the oral cavity. *Dantadhavana* is important procedure in daily routine. According to *Ayurveda* its regular and judicious use is having a prime role in maintaining of the oral health. In today's life, however due to lack of time and poor hygiene, oral hygiene is not properly maintained. In addition to this, habits like tobacco chewing, smoking etc. have increased incidences of diseases of oral cavity. Now a day's many people are suffering from dental problems and oral health problems, because of lack of knowledge of "*Dantaswasthya*". Hence, *DantadhavanaUpakrama* mentioned in *Dinacharya* can play important role in present situation. Therefore, this review article attempts to explain *Dantadhavanain* detail as mentioned in *Ayurvedic* classics and its importance and also explain which precautions should be taken during the time of Teeth brushing Oral diseases are one of the most important problems in public health and are on the rise in developing countries.^[3,4]

Various plants and natural products have been used for their pharmacological applications viz. antiulcer, wound healing, anti-inflammatory, antimicrobial and antioxidant properties etc.^[17] *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.^[18]

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. 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.^[19] The cost of *Ayurvedic* dravyas 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.^[20]

MATERIALS AND METHODOLOGY

Literature from various Ayurvedic samhitas and classical texts reviewed.

Literature from modern dentistry texts reviewed.

According to acharya charak Dantadhavana reduces Asyvairasya, Dantamala, Mukhadurgadhy and Dantamalinata. Acharaya mentioned that early in the morning we have to clean our mouth and teeth by Dantapavana (Dantakashtha) He describes about Dantapavana that it should be 12 Anguli long and the width is as our kanishthika Anguli. It should be similar, straight, fresh, resembles to Uttam Ritu and Dosha, Rasa and Virya. It should have Kashaya, Madhura, Tikta and Katu rasa. He described plants having Tikta rasa for Dantadhavana as Neem, Having Kashya rasa as Khadira, having Madhura rasa as Madhuka, and having katu rasa as karanja. Acharya Sushuta explained about Dantadhavana in Chikitsasthana Adhyaya 24 as^[1] Acharya Sushuta explained about Dantadhavana in Chikitsasthana Adhyaya 24 as we have to do Dantadhavana with Kashtha of above-mentioned trees.^[4] He also says that we can use Churna of above trees for Dantadhavana. This Dantadhavana Churna prevents us from many Mukha and Danta roga. Acharya Charaka Describe Dantadhavana in Sutrasthana as^[1]

Acharya Charaka said that Dantapavana bark should be of Kashaya, Kuta and Tiktarasa. He also says that we have to clean our Danta by using two times daily. Dantadhavana prevent us from Mukha Dourganthy, Virasata, Danta and Mukharata Malas. He also says that Dantadhavana is Ruchikara. Acharya Charaka describes the trees we have to use for Dantadhavana as-Karanja, Karaveera, Arka, Malati, Arjuna, Aasana, and other trees having same properties should use for Dantadhavana.^[3] Some other trees described in Smruthigrantha are-Khadir, Kadamba, karanja, Tintidik, Aamra, Nimba Apamarga, Bilva Arka Udumbar, Awasha. Ashtanga sangraha describe Dantadhavana as describe the trees

we have to use for Dantadhavana as Vata. Arka, Vijaysaar, Khadira, Karanja (Putikaranja) Kaner, Apamargo, Jai, Arjuna He also says that we should use the kashtha of these trees or of other trees having same properties. Ashtanga Hridayakara described Dantadhavana in Sutrasthana Adhyaya.^[7,8]

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, Katu, or Tikta in Rasa. Acharya Sushruta also includes Madhura rasa.^[16] Various recommended plants are Neem (or), Fresh stems of Yastimadhu, Arjuna tree, Vata, Vijaysara, Arka, Khadira, Karanja, Karaveera, Arimeda, Apamarga, Malathi or such other known herbs of above mentioned tastes should be used.^[17] Acharya Susrutha suggested that Nimba is better among bitter ones, Khadira among Astringent ones, Karanja among pungent ones and Madhuka among sweet ones.^[18]

Dantadhavana nishidhha

Various plants not suitable for brushing are mentioned in Ayurveda as - Twigs of Slesmathaka, Arishta, Bibhithaka, Dhanwan, Bilwa, Nirgundi, Sigru, Tilwaka, Tinduka, Kovidara, Sami, Pilu, Pippali, Ingudi, Guggulu, Paribhadraka, Amlika, Salmali, Palasa and Sana should not be used.

Pathologies related to teeth

Dantamala - Dental plaque^[18,19,20]

Dental plaque can define as the soft deposits that from the biofilm adhering to the tooth surface or other hard surface in the oral cavity including removable and fixed restoration. Plaque is differentiated from other deposits that may be found on the tooth surface such as bacteria and tissue cells that lack the organized structure of accumulation of dental plaque and are easily displaced with a water spray. Calculus is hard covered by layer of universalized plaque. Dental plaque broadly classified as -Supragibgival & Subgingival On basis of tooth surface.

Dental plaque is composed primarily of microorganisms, It has been estimated that more than 325 different bacterial species may be found in plaque. Nonbacterial microorganisms that are found in plaque include -Mycoplasma species yeasts protozoa and viruses. The intercellular matrix estimated to accounts for 20% to 30% of the plaque mass, consists of organic and inorganic materials derived from saliva, bacterial products. Glycoprotein from saliva initially coat. Clean tooth surface but become incorporated into developing plaque biofilm. The inorganic components of plaque is primarily I] calcium and II] phosphorus, with trace minerals such as III] sodium, IV] Potassium V] fluoride.

The source of inorganic constituents of supragingival plaque is primarily saliva; as mineral content increases, plaque mass become calcified to form calculus. Calculus frequently found in areas of dentition adjacent and buccal surface of maxillary first molars reflecting the high concentration of minerals available from saliva in those regions. Inorganic Component of sub gingival plaque is derived from plaque also results in calculus formation.

Formation of Dental Plaque Dental plaque may readily visualized on teeth after 1-2 days with no oral hygiene measures. Plaque is white or yellow and has a globular appearance. Movement of tissue and food materials over the teeth results in mechanical removal of plaque such removal is particularly effective on coronal 2/3 of the tooth surface. Plaque deposits also form preferentially in cracks, pits and tissue in the tooth structure.

Danta sharkara - Dental calculus

Although acquired bacterial coatings have demonstrated to be major etiologic factor in periodontal diseases, presence of calculus is of great concern to the clinician. The primary effect of calculus is not due to mechanical irritation but related to its always covered by bacteria. These calcified deposits play a major role in maintaining oral health.

Composition of calculus

Inorganic Contentsupra gingival calculus consists of inorganic (70% to 90 %) and organic components. The inorganic portion consists of 75.9 % calcium phosphate $\text{Ca}_3(\text{PO}_4)_2$, 3.1 % calcium carbonate CaCO_3 ; and traces of magnesium phosphate, $\text{Mg}_3(\text{PO}_4)_2$ and other metals. The principal inorganic components are Calcium, 39% Phosphorus, 19% Carbon dioxide 1.9% Magnesium, 0.8% and Trace amounts of sodium, zinc, strontium, bromine, copper, manganese, tungsten, gold, aluminum, silicon, iron, and fluorine. The four main crystal forms

and their percentage are: 1] Hydroxyapatite, approximately 58 % 2] Magnesium whitlockite 21 % 3] Octacalcium phosphate 21 % 4] Brushite, approximately 9 % .

Organic content the organic component of calculus of a mixture of protein polysaccharide complexes desquamated epithelial cells, leukocytes and various types of microorganisms. 1.9 % to 9.1 % of the organic component is galactose, glucose, rhamnose, mannose, glucuronic acid.

The process of plaque formation can divide in to 3 phases

- 1) The formation of pellicle coating on tooth surface.
- 2] Initial colonization by bacteria and
- 3] Secondary colonization and plaque maturation.

Bacteria associated with periodontal health

Gram +Ve Species	Gram -Ve Species
1) <i>S. sangis</i>	1) <i>P. intermedia</i>
2) <i>S. mitis</i>	2) <i>F. nucleatum</i>
3) <i>A. viscosus</i>	3) <i>Capnocytophaga</i>
4) <i>A. naeslundii</i>	4) <i>Neisseria</i>

DISCUSSION

Dantadhavana is one of the important procedures of Dinacharya for maintaining the health of oral cavity. 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 (*Azadirachta 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 strains of streptococci, staphylococci, pneumococci and *Lactobacillus acidophilus*. At higher concentration extract of mango chewing sticks showed more antimicrobial activity which could be due to the contents in mango extract. Dantadhavana upkrama has significant importance in maintenance of oral hygiene.

CONCLUSION

Ayurveda is a holistic health system recommends some daily therapeutic procedures- Upakrama for maintenance of oral health. The review of above Ayurveda oral health practice-Dantaadhavana and scientific researches indicates that Ayurveda Upakrama-Health 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. Dravyas used in Dantadhavana for daily oral health have anti-bacterial activity. This is due to the presence of potential bioactive compounds. These helps to reduce bacterial load in the oral cavity and thus prevent the formation of dental plaque, dental calculus, dental caries, bad odour from mouth and other problems. Many Ayurvedic herbal plants also possess anti-inflammatory, analgesic, antimicrobial properties. Ayurveda recommends use of herbal brushes. Datuna 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 properties. Nowadays we just started to witness herbal tooth brush era. These Dantadhavana procedure and herbs costs little, possess beneficial medicinal properties.

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