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CONCEPT OF HEALTH PROMOTION W.S.R. TO ORAL HYGIENE

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ABSTRACT

As oral cavity is considered as the gateway to the body. The shape, coating, color and texture of oral cavity can give clues to overall health especially related to digestive system. So, oral hygiene is of prime importance which has significant impact on quality of life. The Global Burden of Disease Study 2016 estimated that oral diseases affected at least 3.58 billion people worldwide, with caries of the permanent teeth being the most prevalent of all conditions assessed. Ayurveda, the life science, mentions *Dinacharya*, a very unique and important aspect of life-style. In *dinacharya, acharyas* recommended *dantadhavana, jiwha nirlekhana* and *kavala-gandusha vidhis* pertaining to oral cavity. Nowadays, in this modern busy life with many unhealthy habits, incorporation of these procedures proves helpful in maintaining the heathy status of oral cavity and preventing its diseases. This paper focuses on the role of *dantadhavana, jiwha nirlekhana* and *kavala-gandusha* in promoting the health by maintaining the hygiene of the oral cavity.

Keywords: oral hygiene, *dinacharya, dantadhavana, jiwha nirlekhana, kavala-gandusha*

INTRODUCTION

The human body is composed of a complex system which are interconnected with other parts. Because of the way, the human body is made, one area of the body can have an impact on different parts of the body. As mouth is considered as the gateway to body. Ayurveda pays special attention to the oral cavity. Not

only as a care for healthy teeth and gums, but also as a diagnostic center of the body condition. As the shape, coating, colour and texture of oral cavity (tongue being considered as mirror of the body) can give clues to overall health especially related to *annavaha srotas* (digestive system), as it is the beginning of *annavaha srotas*. Oral cavity is one among the nine external orifices of the body and of considerable size compared to others. As it is route of entrance of raw materials (food, water etc.) hence it is vulnerable for many infections which enter the body through this route. So, oral hygiene is of prime importance. Oral hygiene is an important factor which has a significant impact on quality of life. The Global Burden of Disease Study 2016 estimated that oral diseases affected at least 3.58 billion people worldwide, with caries of the permanent teeth being the most prevalent of all conditions assessed[1]. Ayurveda recommends *danta-dhavana, jiwha nirlekhana* and *kavala-gandusha* a specialized therapy for good oral hygiene. It will maintain and promote the oral hygiene by exerting cleansing action and by increasing the defence mechanism in the oral cavity. It is used as both preventive and curative for oral diseases. Hence explained as one of the routine procedures under the context of *dinacharya*. In the context of treatment, *acharyas* mentioned these procedures in various *urdhwa jatrugata vikaras* under *shalakya tantra*.

***Dantadhavana-Jiwhanirlekhana*:** *Dantadhavana* and *jiwhanirlekhana* are to be done with twigs of certain plants like *nimba, nyagrodha, arjuna, arka, khadira, karanja* etc. The twig, which is used for *dantadhavan* should be straight, knotless and free from cavity[2]. Each time fresh twigs should be collected from a tree grown in good and clean land. Factors like season, *doshic* predominance of the person, *rasa* and *virya* of twig etc. must be considered before selection of the twig. The tip of twig is made like a brush by biting with teeth. This is used to clean teeth gradually one after the other without causing injury to the gum. This removes foul smell, tastelessness, dirt from tongue, bring freshness of mouth and increase taste perception of food[3]. *Dantadhavana* can be done with *amra* twig, *sirisha* twig and in absence of twig powder of *triphala, trikatu* can be used to improve the good oral health[4]. After cleansing of teeth, tongue cleaning should be done with the help of same twig by dividing it longitudinally and bending it or an instrument which is smooth, soft, 10 angula in length made of silver, gold or iron can be used. It removes bad taste, odour of mouth, cures oedema, stiffness of tongue and gives taste[5].

***Kavala-Gandusha*:** *Gandusha* is a procedure of 'holding any medicated / non-medicated liquid in the mouth to its full capacity for a specific time without allowing any movement inside the mouth. And the easy movement of medicated / non medicated liquid from one side to other, inside the mouth is known as *kavala*. These two procedures seem to be similar as both are having near similar indications and are related to oral cavity. However, the principle difference is that in *gandusha*, there is no space inside the oral cavity when the medicine is filled, but in *kavala*, there is a space. *Gandusha* is done by liquids alone, but *kavala* is usually done by herbal pastes (kalka), though medicated liquids are also used.

Procedure: As Acharyas mentioned, the procedure is to be performed in the morning on an empty stomach[7]. The person performing this procedure should be seated in erect posture with relaxed body and especially relaxed jaw muscles, in a place which is devoid of wind and direct sunlight. His shoulders, throat, cheeks and forehead should be massaged gently and fomented. Now, required quantity of liquid is to be poured in mouth (based on kavala gandusha and individual's capacity to hold) and without swallowing it, he should lift up his face. In such a way that it reaches upto the pharynx[8]. Here the liquid comes in contact with most of the anatomical structures of oral cavity i.e. gums, teeth, hard and soft palates, tongue, pharynx and whole of oral mucosa. He should be advised not to drink the liquid and hold it until oro-pharyngeal secretions and watery discharge appears from the nose and the eyes[9]. Then it should be spit out. In the same way the procedure should be repeated 3, 4 upto 7 times. The oral cavity must be thoroughly rinsed with normal water. By practicing this one enhances strength of mandible, resonance of voice, nourishment of face,

taste sensation and gives good taste. It prevents dryness of throat, cracking of lips, decay of teeth and makes the teeth strong. Person does not experience pain, tingling sensation after eating sour or hard food.

Types of *Kavala-Gandusha* Depending upon the *doshagnata* (*doshic* vitiation) and the *karmukata* (therapeutic effect) of *dravya*, the classical text books of Ayurveda have mentioned 4 types of *gandusha* as mentioned below- *Sneha/Snigdha*[10]- it is oleating type indicated in *vataja vikaras Shamana*[11] - it is palliative type indicated in *pittaja vikaras* (*Prasadana*[12] by Sushruta)

Shodhana [13]- it is purificatory type indicated in *kaphaja vikaras*. *Ropana*[14]- it is healing type indicated in *vrana ropana*. In *dincharya*, acharyas mentioned use of *sneha, kashaya* or *ushnaodaka* based on individual *prakritis*[15].

Mechanism of drug action *Kavala-gandusha* is a form of drug administration into the oral cavity in which the active ingredients and chemical constituents of the drugs reabsorbed through buccal mucosa and reach the blood stream. It is having both in local effect. Based on ayurvedic principle of pharmacokinetics we can state that, by virtue of rasa, the drugs exhibit their local effects within the buccal cavity[16]. As acharyas explained the *karmukata* of *dravyas*, by rasa are-

Coating of the oral cavity, *hitkara* to *kantha* and pacification of *vata pitta* by *madhura rasa*[17]. Excessive salivation, improving taste and pacifying of *vata* by *amla rasa*[18]. Increased taste perception, moistening of mouth, taste improvement by *lavana rasa*[19]. Stimulation of the tip of tongue, irritation in the mouth, taste improvement and pacifying of *kapha* by *katu rasa*[20]. Cleansing action of the mouth especially throat, improving the taste and pacifying the *pitta-kapha* by *tikta rasa*[21]. Stiffening of the tongue, healing of the ulcers and pacification of *pitta-kapha* by *kashaya rasa*[22]. Secondly, the drugs having inherent qualities like *vyavayi* and *vikasi* gets observed from the mouth and then gets distributed in the whole body. Therefore, herbs used in the form of *kavala-gandusha* can show systemic pharmacological actions. As we know, our *acharyas* have mentioned the *sthana* of *doshas*. As *kavala- gandusha* is related to buccal cavity, the predominant *doshas* coming under this *sthana* are- mainly *kapha* which is seated in *kantha pradesh* and *bodhaka kapha* is seated in *jiwha*[23]. *Prana vata* is also seated in *kantha pradesh* where as *udana vata* is located in *ura pradesh*[24].

Anatomical-physiological concept

For proper understanding of anatomical-phyiological significance of *kavala-gandusha* it is better to consider the involving anatomical structures their histology and physiology and general principles of mechanism. As in *kavala-gandusha* the anatomical structures which directly come in contact with medicated/ non-medicated liquid are gums, teeth, soft and hard palates, tongue, pharynx and whole of oral mucosa. All of the oral mucosa is made up of a thick stratified squamous epithelium, supported by a lamina propia[25]. The epithelium is thick because the epithelial lining of the oral cavity is subject to a lot of wear and tear. Underneath the oral mucosa, there is a tough collagenous submucosal layer, with accessory salivary glands, except where the oral mucosa ties over bone, where the submucosa is thin. Tongue is a muscular organ lying on the floor of oral cavity. It is lined by stratified squamous non-keratinized epithelium. Taste buds are the active centers of taste appreciation located on the different papillae of the tongue[26]. They are numerous in circumvallate papillae and are located near its groove, whereas they are very few or almost absent in case of filiform papillae. Taste buds are made up of three different types of cells with a gustatory pore at its apex and the cell are the following- gustatory cells/ receptor cells are the bipolar neuroepithelial cells are specialized for perception of the taste. Supportive/ sustentacular cells are long elongated epithelial cells aid the function of receptor cells and is supportive in function. Basal/ stem cells are the active stem cells, which give rise to receptor cells and supportive cell. Salivary glands are one of the important accessory organs of digestive system. Major salivary glands are 3 pairs in number which contribute about 90% of the total salivary secretions and they are parotid, submandibular and sublingual[27]. Parotid salivary gland is predominantly made up of serous glands and they secrete

thin watery saliva (which helps in maintaining oral hygiene). Sublingual salivary gland is predominantly made up of mucous glands and they secrete thick mucinous saliva. Submandibular salivary gland is made up of both serous and mucous salivary glands. There are many very small buccal glands also which secrete only mucus. Several types of glands provide the different types of alimentary tract secretions. First, on the surface of the epithelium of oral cavity are the billions of single cell mucous gland called simply mucous cells. They function mainly in response to local irritation of the epithelium. They extrude mucus directly onto the epithelial surface to act as a lubricant that also protect the surfaces from excoriation and digestion. The salivary glands are compound acinus glands which lies outside the wall of the alimentary tract and in this, differ from all other alimentary glands. They contain millions of acini lined with secreting glandular cells. These acini feed into a system of ducts that finally empty into the alimentary tract itself.

Stimulation of the salivary glands[28] The mechanical presence of medicated / non-medicated liquid in oral cavity usually causes the salivary glands to secrete moderate to large quantities of secretions. Part of this local effect, especially the secretion of mucus by mucous cells, results from direct contact stimulation of the surface glandular cells by the presence of liquid. In addition, local epithelial stimulation also activates the enteric nervous system. The types of stimulation that do this are- tactile stimulation, chemical irritation and distention of the gut wall. The resulting nervous reflexes stimulate both the mucous cell on the gut epithelial surface and the deep glands in the gut wall to increase their secretion.

Parasympathetic stimulation[29] Stimulation of the parasympathetic nerves to the alimentary tract almost invariably increases the rates of alimentary glandular secretion. It is because the parasympathetic fibres activate the acinar cells and dilate the blood vessels of salivary glands. This is especially true of the glands in the upper portion of the tract which are innervated by the glossopharyngeal and vagus parasympathetic nerves such as the salivary glands, esophageal glands, gastric glands and so on. Chemicals in the food stimulate receptors in the taste buds on the tongue, and impulses are conveyed from the taste buds on the tongue to two salivary nuclei in the brain stem (superior & inferior salivatory nuclei). Returning parasympathetic impulses in fibers of the facial and glossopharyngeal nerve stimulate the secretion of saliva. The mouth is loaded with pathogenic bacteria that can easily destroy tissues and cause dental caries. The secretion of saliva plays an exceedingly important role for maintaining healthy oral tissues. Firstly, the flow of saliva itself helps wash away pathogenic bacteria as well as food particles that provide their metabolic support. Second, saliva contains several factors that destroy bacteria. The thiocyanate ions act as bactericidal and lysozyme, a proteolytic enzyme attacks the bacteria. Third, saliva often contains significant amounts of protein antibodies that can destroy oral bacteria, including some that cause dental caries[30]. In the absence of salivation, oral tissues often become ulcerated and otherwise infected and caries of the teeth can become rampant.

Sympathetic stimulation[31] Stimulation of the sympathetic nerves going to the salivary glands cause a slight to moderate increase in secretion, which is thick and rich in organic constituents such as mucus. It is because, these fibres activate the acinar cells and cause vasoconstriction. The neurotransmitters are noradrenaline. The sympathetic stimulation has a dual effect. First, sympathetic alone usually slightly increases secretion. But second, if parasympathetic or hormonal stimulation is already causing copious secretions by the glands, super imposed sympathetic stimulation usually reduces the secretion, sometimes significantly so, mainly because of vasoconstrictive reduction of blood supply. Mucus is a thick secretion composed mainly of water, electrolytes and a mixture of several glycoproteins, which themselves are composed of large polysaccharides bound with much smaller quantities of protein. The mucus secreted by the salivary glands have the lubricating qualities and often contains large quantities of bicarbonates and potassium ions which lubricate the oral mucosa and protects the oral cavity and its underlying structures.

DISCUSSION

Oral hygiene is of prime importance as it is vulnerable for various infections. Because oral cavity being the *mula* of *annahavaha srotas* through which the edible substances enter the body in undigested form. Ayurveda believes in holistic approach as it lays more importance on preventive aspects. In the context of the unique concept of *dinacharya, Dantadhavana, Jiwha nirlekhana* and *Kavala-Gandusha* are mentioned. Cleansing of oral cavity in the morning after attending the urges specifies the importance of cleansing action and nourishment with particular *dravyas* as well as the importance of stimulation of enteric nervous system especially the glossopharyngeal, vagus and facial nerve after the expulsion of previously digested food. And it is also the *sthana* of *rasanendriya*. Nourishing the *indriya* itself is a big contributing factor in maintaining of health. And makes an individual understand his/her actual health status. *Dantadhavana* a procedure pertaining to cleaning of teeth. The *dravya* mentioned removes off the accumulated plaque, foreign particles and bad odour from the teeth and gums. The specific *rasa yukta dravyas* act based on *prakriti* of individual and maintain the normalcy of dosha in oral cavity. And prevents the *dantamulagata* and *danta rogas*. Removal of plaque prevents the infection in gums and *krimidanta. Jiwha* is one among the *pancha jyanendriyas* and being termed as an index for individual's alimentary system is usually prone to ulcerated wounds, loss of taste, bad breath and so on. The formation of *aam* in the body can be seen in the form of coating over the *jiwha* commonly noticed is a primary indication for further occurring diseases. It obstructs the pathway of receptor cells of taste buds which eventually are unable to transfer the signal to active stem cells. This leads to the improper appreciation of taste and disturbed digestion of carbohydrates in the mouth. Hence in disease like *Aruchi, Aasya vairasya* and so on, by cleaning *jiwha* in a proper specified way helps in maintaining the hygiene of the tongue and as well as improves the function of cells of taste buds. *Kavala-gandusha*, nowadays due to the influence of western culture popularized as oil pulling or oil swishing. Its pertaining to the whole of oral cavity upto the pharynx. The mechanical presence of *dravya* stimulates the activity of taste buds and the active ingredients of the *dravya* cause irritation to the oral mucosa. These together activate the parasympathetic nerve fibres of glossopharyngeal and vagus nerve. This induces the increased secretions by salivary glands. The use of *ushnodaka* (warm water) for day to day practice or in sore throat is beneficial as it liquefies the vitiated *kapha* of *gala Pradesh* and expels it out. It improves the taste by stimulating the taste buds. In case of oil swishing with plain *tila tail* nourishes the tissue of buccal mucosa. The *prakupita vata* leading to dryness, roughness and stiffness of oral cavity structures is perished by the presence of *taila*. As the salivary glands get stimulated by the presence and movement of the *dravya* in the mouth. The stimulated glands secrete water as well as mucus. The viscous (unctous) nature of the oil inhibit the bacterial adhesion. The watery portion of saliva destroys the pathogenic bacteria. The mucus secretion provides lubrication to the oral cavity structures. Due to the regular movement of *dravya* the oil disperses in the saliva which eventually increase the cleansing action of the oil. The tail due to its *vyavayi* and *sukhshma guna* gets absorbed faster and finer. It primarily acts locally and then shows systemic effects. This implies that *kavala-gandusha* is not just effective over the oral cavity but indirectly acts on the other structures as well. The major oral health conditions are dental caries, tooth sensitivity, loose tooth, gingivitis, stomatitis, pyorrhea, odonitis, bleeding gums, ulcerated wound, oral cancer and so on. In such pathological conditions we notice disturbance in the normal anatomy, histology and physiology. In inflammatory and infectious conditions, the *shothahara, shodhana* and *ropana dravyas* used in *kavala-gandusha* will helps to the expulsion of the dead cells and induce the regeneration of new cells. This happens by the inducing of sympathetic nerve fibres which reduces the secretion in case of *shotha* (due to hypersecretion) by vasoconstriction of blood vessels. The *shodhana dravyas* irritate the mucosa and eventually stimulate the secretion of both watery and mucus saliva in required quantity from salivary glands innervated by parasympathetic nerve

fibres of glossopharyngeal, vagus and facial nerve. The bactericidal action of saliva destroys the bacteria and the protein antibodies inhibit the further growth of pathogens. The *ropana dravyas* acts on the regeneration of the tissue. The lubricating and healing property of saliva fastens the healing of the damaged tissue. In conditions like Bell's palsy paralysis of facial muscles, loss of tonicity of muscles, loss of taste, decreased salivation, loss of ability to close the eyes is seen due to damage of the somatic motor nerve fibres of temporal, zygomatic and buccal branches of facial nerve. The chemical constituents of *snigdha* and *sneha yukta dravyas* like *Arimedadi taila, khadiraadi tail* and so on stimulate all branches supplying the muscles of facial expression and improve its tonicity. Similarly, the use of particular medicated *dravyas* in particular condition have their own effects based on the active chemical constituents acting upon the pathology of the condition in terms of bringing back it to normalcy.

CONCLUSION

In present era, where improper lifestyle is the main causative factor for several diseases. Ayurveda focuses on maintenance of health and prevention of diseases by following the *dinachayra*. In which, the particular time (i.e. *prathaha kala*) mentioned to perform *Dantadhavana, Jiwhanirlekhana* and *Kavala-Gandusha* specifies the importance of cleansing action and the nourishment of the oral cavity which is the main *sthana* for *rasanendriya* and other important structures. This procedure stimulates the entire enteric nervous system which eventually improves the coordination of the structures related to oral cavity. Practicing of *kavala-gandusha* with the view of preventive effect is advisable. As mentioned, "*acharata aayuh labhate*" incorporating the basic preventive principles of Ayurveda related to the oral cavity will surely prove helpful in maintaining the stable and good health.

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