



RATIONAL AYURVEDIC APPROACHES IN PREVENTING ORAL DISEASES: A SCIENTIFIC REVIEW

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ABSTRACT

Oral health plays a crucial role in maintaining overall well-being, serving as the gateway to the gastrointestinal tract and influencing various systemic diseases, including cardiovascular disease, gynecological disorders, and carcinoma. India records the highest prevalence of oral cancer globally, with 19 cases per 100,000 populations, making it the most common cancer in men and the third most common in women. Despite its significance, oral health surveys in India have been insufficient, leading to a lack of comprehensive data and proper intervention strategies. Ayurveda emphasizes oral hygiene as an essential daily practice ('Dinacharya') and offers various preventive and curative measures against oral diseases. Ayurveda has described several regimens for oral care which includes, 'Kavala', 'Gandusha' etc to maintain oral hygiene and prevent oral diseases. Various medicinal formulations such as Tila Kalka, Madhu udaka (honey water), and Dhanyamla (fermented preparations) have been traditionally used for oral care, targeting diverse oral pathologies based on dosha predominance. Ayurvedic herbs and compounds, including Tila taila (sesame oil), Honey, Kshara jala (alkaline water), and Triphala, Trikatu have been scientifically analyzed for their therapeutic potential in oral health care. Studies indicate their role in maintaining oral mucosal integrity, inhibiting microbial growth, and modulating immune responses. These drugs and formulations exhibit antibacterial, anti-inflammatory, antioxidant, and anticancer properties, contributing to oral disease prevention. The Ayurvedic perspective provides a promising preventive and therapeutic approach through simple formulations as a daily regiment and lifestyle recommendations. Inculcating such potent phytochemical compounds with preventive regimens, ensures sustained oral hygiene thereby mitigating the rising burden of oral diseases and thereby promotes a sustainable and effective oral health strategy.

Key words: Oral health, Gandusha, Kavala, Dinacharya

I. INTRODUCTION

The mouth serves as the gateway to the gastrointestinal tract, marking the beginning of the intricate journey of digestion. An optimal oral health prevents the risk of many systemic diseases like cardiovascular disease, Gynecological disease, carcinoma.¹ Considering Global level, the highest prevalence of oral cancer in the world is occupied by India with 19/100,000 populations. It is the most common cancer in men and the third most common cancer in women, constituting 13%–16% of all cancers. Lack of oral health survey is one of the key factor in the upsurge of oral diseases in India. In 2016, the first attempt was made to assess the state-wise Global Disease Burden (GDB) of India. However, oral health, an essential component of general health, was completely overlooked and not documented in the survey (Panchali Batra. et.al)³. The survey revealed the 0.4% prevalence of oral cancers. This decrease in this prevalence points towards the relevant method of diagnosis or inaccurate recording of

cancer cases. 80,000 new cases of oral carcinoma cases are detected every year. Among them 95% cases are squamous cell carcinoma (Panchali Batra. et.al).⁴ Indian population lack in enduring and maintaining Oral hygiene. This is considered as one of the chief causes of Oral diseases like tooth cavities, periodontal diseases, tooth decay, oral lesions and finally oral cancer. Ayurveda gives importance to Oral hygiene as a daily routine which is included in 'Dinacharya'. Just like contemporary recommendation of brushing, *Dantha dhavana* is recommended by Ayurveda acharyas which should be practiced in morning and after meals.⁵ As a causative factor for Mukha roga (Oral disease), 'Dvishatho dathadhavana', abstaining from brushing / Oral hygiene is included by Acharya Vagbhata in Ashtanga Hridaya.⁶ Various regiments have been recommended in Ayurveda scriptures as a part of prevention and cure of oral diseases and to sustain an ideal oral health

Material and Methods:

The present work is to introduce certain Ayurveda regiments and formulations which can be used in daily practice to maintain oral health and thereby preventing oral diseases which ends in carcinomas.

'Mukharogas' are described as *Kapha pradhana* tridoshaja rogas.⁷ Seventy-four Mukha rogas are described by Acharya Sarangadhara⁸ which are categorized as disease pertaining to teeth, periodontal area, tongue, throat etc. Ayurveda describes regiments like Kavala, Gandusha, Dhavana, Dhumapana and Sodhana therapies like 'Vamana', 'Siravyadha' for Mukha rogas. these regiments are thus recommended to prevent oral diseases thereby maintain a healthy oral mucosa or to cure. They are also prescribed as a part of cure for different oral ailments. Apart from regular brushing which may be correlated with 'Dantadhavana,' 'Kavala' and 'Gandusha' may be considered as first line regiments in oral health care. They may be easily suggested and practiced by individuals as a home remedy. They are recommended in all major and minor diseases pertaining to oral cavity. Based on the dosha predominance, the drug may be selected optimally. Different Gandusha dravya include sneha (medicated oil, ghee etc.) Dhanyamla, Madhu udaka (Honey water), Tila Kalka (Paste of seshamum), Mamsarasa, grita, Kshira, Kshara jala (alkaline water), Sukha ushna Jala are mentioned by Acharya Vagbhata in Ashtanga Hridaya.⁹ These are opted for specific pathologies of oral cavity. Acharya Sarangadhara more likely accepting the same drugs adding Nilotpala, Trikatu, Rajika, Ardraka, Triphala. Vridha Vagbhata has included certain drugs which are opted for a curative approach for mukha roga include Patola, Nimba, Jambu, Amra, Malati, Utpala, Madhuka.¹⁰ Furthermore he has opined that for 'Arbuda' (solid tumors) after excision and scrapping, gandusha with Svarjikshara, Nagara and Madhu is indicated.¹¹

Table 1: Specific drugs for Gandusha and their corresponding indication according to Acharya Vagbhata¹²

Sl. No	Drugs mentioned	Indications
1.	Tila Kalka udaka (Ushna / Sheeta)	Danta harsha – Danta chala – vatika mukha roga
2.	Taila – Mamsa rasa	Nitya Gandusha
3.	Grita / Ksheera	Conditions like Mukhapaka associated with Usha and Daha, Aganthuja kshata -Visha – Kshara – Agni
4.	Madhu	Vaishadya, Mukha vrana sandhana, Daha Trishna shamana
5.	Dhaanyamla (with lavana)	Mukha Vairasya, durgandha due to dantha mala
6.	Dhaanyamla (without lavana)	Mukha sosha hara
7.	Kshara Jala	Kapha roga
8.	Sukha Ushna Jala	Mukha Laghava

Table 2: Specific drugs for Gandusha and their corresponding indication according to Acharya Sarangadhara ¹³

Sl. No	Drugs mentioned	Indications
1.	Tila Kalka Udaka + Ksheera/ Sneha	Snaihika Gandusha
2.	Tila + Nilotpala + Grita + Sarkara+ Ksheera+ Madhu	Daha nashana , Vaishadya , Mukha vrana hara
3.	Grita / Ksheera	Conditions due to Visha – Kshara – Agni
4.	Taila + Saindhava	Dantha chaala
5.	Kanjika	Mukha Sosha , Mukha Vairasya
6.	Saindhava + Trikatu+ Rajika + Ardraka	Kapha roga
7.	Triphala + Madhu	Kapha -Rakta -Pitta roga

Discussion

Considering the drugs which are mentioned for the Gandusha or Kavala, a critical analysis on the phytochemical study was carried out based on some previous research. It revealed the rationality in using these drugs as a part of preventive and curative mode in oral diseases.

'Taila' ('Tila taila') is recommended for gandusha on daily basis ('Nitya Gandusha'). Tila (sesamum indicum) included in Pedaliaceae family possess phytochemicals like sesamin, 'sesamol', 'sesaminol' and 'sesamol'. Sesame seed possess antioxidant activity which is supposed to be the synergistic effect of tocopherol and lignans content in it. 'Sesamin' is anti-inflammatory antioxidant, Sesamol, 5-hydroxy-1,3-benzodioxole or 3,4-methylene-dioxyphenol an effective antioxidant. It has a benzodioxole group, which is able to scavenge hydroxyl radical to produce 1,2-dihydroxybenzene. 'Sesamol' has also been found to exert chemopreventive effect and anti-mutagenic effects. 'Sesamol' is the commonly known furofuran lignan isolated from the seeds of Sesamum indicum. Sesamol has the molecular formula $C_{20}H_{18}O_7$. Sesamol has an effective growth inhibition activity which points towards its anticancer pharmacological property. ¹⁴

'Honey' (used as honey water in gandusha), contains Amino acids such as *proline, arginine, glutamic acid, cysteine and aspartic acid. flavonoids, glucose oxidase, catalase, phenolic acids, ascorbic acid,* and carotenoids in honey are expected to possess antioxidant and antibacterial properties.¹⁵ Honey helps in inducing apoptosis to cancer cells by depolarising the mitochondrial membrane and stimulating expression of caspase 3 and 9 in cancer cells. ¹⁶ Honey is also expected to prevent cancer due to its antimutagenic activity against physical and chemical mutagens. It suppresses the error-prone repair pathway in bacterial cells thereby decreasing mutations in these bacteria during division. The high sugar content, low pH, hydrogen peroxide, polyphenol compounds, and antimicrobial peptides exerts its defence against various pathogenic organisms.¹⁷

'Kshara ambu' is commented by Arunadatta as 'Svarjikadina'. ¹⁸'Svarjikshara' is prepared from 'Kshudra duralabha' (Fagonia cretica Linn.) belonging to family – Zygothaceae through kshara kalpana. Studies reveal that Svarjikshara possess the properties of Anti-inflammatory, Antioxidant, Anti-microbial, Antihaemorrhage Anticarcinomic, Anti-fertility, Antipyretic, Antitumor , Thrombolytic activity. Certain phytochemicals are detected in them which include Alkaloids, Flavonoids, Terpenoids, Saponins, Tannins, Coumarins, Sterols and Glycosides, Vitamin B2 (Riboflavin), Vitamin B5 (Niacin) and Vitamin C (Ascorbic acid) Proteins like Lysine, Threonine, Serine and Glutamate as major amino acid.¹⁹

'Dhanyamla' is a fermented preparation, categorized under 'Sukta' group of 'Sandhana Kalpana'. It is prepared by fermenting cereals Tandula (Rice), Pruthuka (parched – flattened rice), Laja (Fried – puffed paddy), and pulses Kulatha, seeds like Kangu beeja, Kodrava , Ajamoda, tubers like Nagara, sour fruits like Nimbu.²⁰ Research works have described that these ingredients possess several phytochemical properties like Anti – inflammatory, anti-oxidant, analgesic, Anti- bacterial, anti-adipogenic actions. The chemical constituents in the ingredients include Flavonoids, Glycosides, Alkaloids, Essential acids

phenols, Saponins which holds antiviral activity, anti-inflammatory, antimicrobial activities. They are also expected to modulate immune responses.²¹

'*Nilotpala*' (*Nymphaea stellata* Willd.) is identified to have pharmacological properties like tumour inhibition activities, anti-inflammatory activity. Nymphayol, a steroid isolated from the flowers is claimed to have the potential to reverse the damaged endocrine tissue and stimulate secretion of insulin in the β -cells.²²

'*Trikatu*' is a combination of three drugs (namely Pippali, Maricha and Sunti). It is widely used in numerous ayurvedic formulations irrespective of dosage forms. Trikatu holds several pharmacological activities like antioxidant, analgesic, anti-inflammatory, antimicrobial, antifungal, anthelmintic, antihyperlipidemic and antitumor activity.²³ '*Triphala*', a combination of three drugs namely Haritaki, Vibhitaki and Amalaki is widely accepted by researchers to exhibit anti-oxidant, antimicrobial, anti-tumour activity due to the presence of metabolites such as glycosides, phytosterols, alkaloids, oils, saponins, phenols and flavanoids.²⁴

'*Milk*' is considered as fat in water emulsion where fat globules are dispersed in an aqueous phase which contains dissolved proteins, lactose, minerals etc. Milk contains essential bioactive peptides that exhibit a range of beneficial biological activities, including antimicrobial, antihypertensive, antioxidant, antithrombotic, and immunomodulatory effects. Among its proteins, lactoferrin plays a significant role in defence mechanisms by demonstrating bacteriostatic and bactericidal properties through iron binding. Antimicrobial peptides (AMPs) effectively target both low- and high-affinity pathogens, enhancing their ability to circumvent pathogen resistance, making them crucial in the evolving field of antimicrobial therapy. Specifically, milk-derived AMPs contribute to innate immunity, particularly on mucosal surfaces such as the lungs and small intestine, which constantly encounter a diverse array of pathogens.²⁵

Conclusion

Mouth is the entrance to the digestive process, opening the pathway to the gastrointestinal tract. Oral health is an integral aspect of general health. Negligence in oral health care may lead to oral diseases including oral carcinoma. Ayurveda perspective provides a promising preventive and therapeutic approach through simple formulations as a daily regimen and lifestyle recommendations. Adopting regimens like Gandusha using suitable drugs in appropriate dosage form helps in attaining optimum oral health. Reviewing the research works conducted on various drugs mentioned by our Acharyas, a clear role of different phytochemicals in maintaining the oral health or curing the disease condition have been highlighted. Potent phytochemicals compounds with preventive regimens, ensure sustained oral health. Incorporating these practices which are described in our traditional Indian system of medicine into daily routines may help mitigate the rising burden of oral diseases. An innovative approach through modern dosage forms may also be adopted for easy incorporation of these drugs to the consumers. This may include mouth gargles, tooth paste, gels, oral troches etc. These dosage forms may increase the bioavailability of drugs when exposed to oral cavity promoting a sustainable and effective oral health strategy.

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