

A comprehensive drug review on the role of ayurvedic medicinal plants in mukharogas with special reference to oral diseases

Abstract

Ayurvedic drugs have been used since ancient times in periodontal therapy and Oral diseases. It also reflects the quality of life of the individual. Due to the high prevalence rate, these oral, periodontal and dental diseases continue to be a major threat in India. There are limited references available on the prevention of these diseases in conventional medicines. At this juncture, a glimpse into classical Ayurvedic texts reveals huge potential of many medicinal plants being used. Hence an effective makeshift from synthetic chemicals can be through the medicinal plants mentioned in traditional science. These also serve as a promising approach in prevention and therapeutic strategies of dentistry. Hence, an attempt has been made to understand the phytochemicals contributing to specific actions in oral diseases. Hence, a thorough review has been made in the science of Ayurveda regarding the detailed descriptions of oral diseases (Mukha rogas) by various Acharyas with respect to its diagnosis, examination, management and prevention. A concept has been framed accordingly as a guide to practitioners focusing mainly on the possible role of Ayurveda in the management of Oral Diseases and also to create awareness regarding the usage of medicinal plants in oral diseases.

Keywords: dentistry, ayurveda, oral diseases, ayurveda, medicinal plants

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Introduction

Oral diseases ranging from dental cavities to cancer are all serious threats to oral health.¹ Oral health are an integral part of one's overall health. It is a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing. At present, the distribution and severity of these diseases vary among different parts of the world and within the same country or region. The most common oral diseases are dental cavities, periodontal (gum) disease, oral cancer, oral infectious diseases, trauma from injuries, and hereditary lesions. Worldwide, 60–90% of school children and nearly 100% of adults have dental cavities, often leading to pain and discomfort. Severe periodontal (gum) disease, which may result in tooth loss, is found in 15–20% of middle-aged (35–44 years) adults.² Dental cavities and periodontal disease are major causes of tooth loss. Complete loss of natural teeth is widespread and particularly affects older people. Globally, about 30% of people aged 65–74 have no natural teeth. The incidence of oral cancer ranges from one to 10 cases per 100 000 people in most countries. The prevalence of oral cancer is relatively higher in men, in older people, and among people of low education and low income. These are also risk factors for the four leading chronic diseases – cardiovascular diseases, cancer, chronic respiratory diseases and diabetes – and oral diseases are often linked to chronic disease. Poor oral hygiene is also a risk factor for oral disease. The prevalence of oral disease varies by geographical region, and availability and accessibility of oral health services.¹

Ayurveda mentions the diseases pertaining to Mukha rogas (diseases of the face and oral cavity) as Osta roga (diseases of

lips), Danta moola roga (diseases of gums), Danta roga (diseases of teeth), Jihwa roga (diseases of tongue), Talu roga (diseases of palate), Gala roga (diseases of throat), Mukha dhi (sarvaja), Ganda roga (diseases of face). Each subheading has been elaborated along with its classification, risk factors, management and prevention aspect. Although there are detail descriptions of oral diseases in Ayurveda, dentistry needs to be explored further and should be established as a potent complementary therapy and an alternative choice of treatment for better future to make an impact in the management of pain and suffering, impairment of function and reduced quality of life.

Methodology

Ayurvedic Classical Texts like Sushruta samhitha,³ Charaka samhitha were thoroughly screened for medicinal plants used in oral diseases. The literature showed that there are numerous Ayurvedic drugs, which can be used in prevention as well as management of oral and dental diseases. Most frequently repeated medicinal plants were shortlisted as important ones. This paper has made an attempt to review various herbal drugs mentioned in Ayurvedic literatures that can be used as an adjunct for the maintenance of oral and dental health (Table 1).

Discussion

Oral malodor is a major social and psychological problem that affects the majority of the general population.^{4,2} This review evaluated the clinical efficacy of the available Ayurvedic drugs in the literatures which are advocated in the management and prevention of Oral and Dental diseases. The aim was to collect the available evidence to clinically review and conceptualise the use of herbal plants mentioned in our classics. Many Ayurvedic herbal plants, which were reviewed,

possess kapha and vata dosha mitigating properties together with deepana (appetiser), pachana (digestive), ruchya (taste enhancer), vrana ropaka (wound healing and anti-ulcerogenic), rasayana (anti-oxidant), shothahara (anti-inflammatory), krimihara (anti-microbial), raktashodhaka (blood purifier), raktasthambaka (styptic), vedanasthapaka (analgesic) and daha prashamaka (reduces burning sensation). The phytoconstituents which are common in herbal drugs used in Mukha rogas are flavonoids like kaempferol, quercetin, terpenoids, glucosides, saponins, β -sitosterol, steroids, gallic acid, terpenoids, coumarins, vitamin C, tannins, and alkaloids. These drugs possess potent anti-inflammatory, anti-microbial, astringent, antioxidant properties, decrease blood lipids, lower cancer risks, when reviewed according to the modern parameters. However, among these very negligible herbals extracts and drugs are being used in routine clinical dental practice. Cloves are widely used in dental care since 13th century and are effective against a large number of bacteria. The main component of clove oil is eugenol, with β -caryophyllene and eugenyl acetate.⁴¹ Similarly, research data has revealed that *Ricinus communis* can improve the clinical condition of denture stomatitis in institutionalized elderly patients, showing similar results to Miconazole.⁴³

The irrigating solution used in dentistry must combine maximum antimicrobial action with minimum toxicity, physical and chemical properties associated with a feasible cost to the professional. It has been proved that castor oil and sodium treatment of root canals with pulpal necrosis. The antimicrobial action of sodium hypochlorite and castor oil was found to be significant for streptococci.⁴⁴ Similarly *Pinus roxburghii* is highly popular as a potent analgesic and anti-inflammatory agent.⁴⁵ Likewise, also *C. deodara* have many qualities and features including anti-inflammatory, antitumor, anti-bacterial, antifungal.⁴⁶ The drug *Glycyrrhiza glabra* has multiple actions in oral diseases.⁴⁶ *G. Glabra* has been proved as an appropriate candidate to control dental caries and endodontic infections.⁴⁷ In yet another study, Babool and *Glycyrrhiza glabra* (Liquorice extracts) are effective in inhibiting the growth of cariogenic pathogens like streptococcus mutans and Babool and Clove extracts are effective antimicrobial agents against *Enterococcus faecalis* and can be used to reduce root canal microflora and root canal failures.⁴⁸ Dental caries is a chronic, infectious, transmissible, and biobehavioral disease that extends throughout the life span. By selectively killing or inhibiting the cariogenic bacteria within a pathogenic Dental plaque, a non-pathologic, commensal microbial community could be established. This healthy plaque would then serve as an effective barrier to prevent the subsequent colonization of cariogenic bacteria on the tooth surface, leading to a sustained anti-caries therapeutic effect. Hence, *Glycyrrhiza glabra* be used as cavity-fighting components in mouthwash and toothpaste because of its agreeable taste.⁴⁸ Honey is yet another valuable medicine used in oral disease because of its multiple benefits. The potent and anti-inflammatory property of honey rapidly reduces pain and inflammation. Topical application of honey has many advantages including antibacterial, antifungal, and anti-inflammatory properties. The antimicrobial activity of honey is due to high osmotic pressure, physical properties, and enzymatic glucose oxidation reaction. Honey consists of polyphenols that have beneficial effects on dental caries, oral cancer, and periodontal diseases. Topical application of bee honey seems to be effective in the treatment of some common oral lesions where they are routinely treated with cortisone therapy, and so it seems promising for some oral lesions aphthous stomatitis, as well as other oral lesions such as recurrent herpes labialis,

recurrent intraoral herpes, atrophic/erosive oral lichen planus, oral candidiasis, and oral psoriasis can be successfully treated with honey. Honey significantly increased the resolution of the inflammatory and ulcerative oral lesions. It has been shown to significantly lower the pain sensation, reduce the duration of some lesions, and increased the number of pain-free days.⁴⁹ The data suggested that topical application/chewing of honey might help prevent gingivitis and caries in patients undergoing orthodontic treatment.⁵⁰ Hence, Honey can be used to develop oral hygiene products such as toothpastes and mouthwashes to prevent dental caries.

The Decoction of fresh leaves of the drug *callicarpa macrophylla* is useful as a regular mouthwash for recovery from sores and gingivitis.⁵¹ It is a strange coincidence that lac has been used in many forms and in various ways since long time. Most of them use lac as a binding texture for dentures. In addition, lac is used in dental schools for preparation of moldings and artificial calculus. lac as a binding texture for dentures. Lac has been used in Ayurvedic medicine also for oral diseases.⁵²

Mustard seeds are effective in gastrointestinal and colorectal cancer, as mustard is rich in glucosinolate and phytonutrients. Salt in topical formulation is found to have anti inflammatory action. They both have shown promising results in the treatment of Chronic Periodontitis.⁵³ Chewing gum containing allylthiocyanate from mustard seed extract is effective in reducing volatile sulfur compounds responsible for oral malodor.⁵⁴ *Acorus calamus* is a sedative, hypnotic, tranquilizing, and memory enhancing, which justifies its use in some CNS diseases in the Ayurvedic system of medicine. It also has effective acetylcholinesterase inhibitory, antispasmodic, antimicrobial, anti-inflammatory, actions.⁵⁵ Oral squamous cell carcinoma (OSCC) is the most frequently diagnosed malignant cancer in the head and neck region, accounting for approximately 95% of oral cancers. *Holarrhena antidysenterica* is a potentially safe anticancer agent against OSCC growth and OSCC-mediated bone resorption.⁵⁶ *Triphala* is a novel drug with an array of therapeutic activities gifted by Ayurveda to the world. It is a combination of three drugs and has shown significant anti-bacterial activity. In addition, Anti-collagenase activity of *Triphala* Anti-microbial and anti-oxidant effect are well established. It has advantage as a herbal alternatives for root canal irrigant and against oral candida species.⁵⁷ Gallic acid present in it is said to be responsible to scavenge the free radicals. The drug *Symplocos racemosus* contains three principal alkaloids, viz. loturine, loturidine and colloturine. And the decoction of the bark is used as a gargle for bleeding gums.⁵⁸

Conclusion

The Dental and Oral diseases are one of the major concerns in recent times. Use of indigenous plants in the management of various diseases has been proven to be safe and effective, through several hundred to several thousand years of use. The natural phyto-chemicals could offer an effective alternative to antibiotics and represent a promising approach in prevention and therapeutic strategies for dental and other oral diseases. Access to oral health hygiene and clinical practice is limited in Ayurveda and is almost negligible. Thus it remains a major challenge to practitioners in Ayurveda to assess the efficacy of herbal drugs to improve and manage oral and dental diseases. There is need of potent Ayurvedic formulations to make an impact in the management of pain and suffering, impairment of function and reduced quality of life. Meanwhile the traditional

knowledge of Ayurveda should be integrated with the modern dentistry wherever necessary. For this, the active principles of plants should be incorporated into modern oral health-care practices and dentists should be encouraged to use natural remedies in various oral health treatments. This will make dentistry much safer, affordable and more accessible for the lower socio-economic groups in society. As this field is hardly explored part in the field of Ayurveda, there is an urgent need for integration of professional dental treatment modalities and complementary alternative medical (CAM) systems to provide the best and unique from each system to patients as a complementary therapy and an alternative choice of treatment for better future.

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Conflicts of interest

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