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An Introduction to Herbal Remedies in Endodontics

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Abstract

Folk medicine has utilised natural ingredients since prehistoric times. Plant-based pharmaceuticals known as herbal medicines are used to cure illnesses and achieve or preserve better health. A valuable and efficient means of treating a wide range of illnesses are herbs having therapeutic qualities. The origins of many pharmaceuticals used in allopathic treatment, or Western medicine, can be traced back to medicinal plants. The numerous natural medications and items that are utilised as phytomedicine in endodontics are the main topic of this review.

Keywords:

Endodontics; Herbal; Phytomedicine; Dental caries

Introduction

Herbs, herbal materials, herbal preparations, and finished herbal products that have plant parts or other materials as active components are referred to as herbal medicines (also known as botanical medicine, phytomedicine, or phytotherapy). Because of their strong antibacterial activity, biocompatibility, anti-inflammatory, and antioxidant qualities, herbal or natural products are becoming more and more popular these days [1] . Researchers are becoming more interested in alternate treatments and products for oral disorders as a result of the increased occurrence of pathogenic bacteria resistance to currently used antibiotics and chemotherapeutic medicines. Therefore, natural phytochemicals that have been extracted from plants and utilised in conventional medicine are thought to be good substitutes for artificial chemicals.

According to the World Health Organization (WHO), as many as 80% of the world's people depend on traditional medicine (herbal) for their primary healthcare needs [2] . Herbal remedies have a long history of use for gum and tooth problems. In many traditional cultures, the use of herbal "chewing sticks" taken from plants, shrubs or trees with high anti-microbial activity are common. A herb may exhibit one or more following unique therapeutic properties like anti-bacterial, anti-inflammatory, astringents, anaesthetic, immune strengtheners, anticariogenic, anti plaque agents and tooth whitener [3] . Herbs may be good alternatives to current treatments for oral health problems but there is lack of information about the effect of herbs in oral tissues, mechanism of effect, and side effects. So the more research is required to

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explore these traditional medicines [3]. Dental caries are still one of the most common diseases in the world. Streptococcus mutans has the central role in the initiation of caries on tooth surfaces [4] . Today, herbal medicines are introduced into the tooth pastes to prevent dental caries. The anti-cariogenic property of polyphenols is mainly due to a direct effect against *S. mutans*. It inhibits the adherence of bacterial cells to the tooth surface by interacting with the microbial membrane proteins [5] . In endodontics herbs are mainly used for the disinfection of the root canal. There is increased research towards the herbal irrigants due to the some adverse effects of the most of synthetic intracanal medicaments. *E. Faecalis* is most common bacteria responsible for root canal treatment failure cases [6] . Sodium hypochlorite is used to eliminate *E. faecalis* from the root canal but there are several disadvantages of sodium hypochlorite like unpleasant taste, toxicity, and potential weakening of the tooth structure by decreasing the hardness and structural integrity of the dentin within the root canal [7] . Thus the aim of this review is to enlist and describe the various herbal alternatives available today for use as effective endodontic medicaments and caries control agents. Articles were collected using PubMed and Google Scholar search engine in relation to herbal medicine, dentistry and endodontics.

Aloe Barbadensis (Aloe vera gel)

Aloe vera plants have a clear gel inside their green leaves that is used to make juice. Its primary chemical components are barbadoins and alloins. Aloe vera is used in dentistry to treat lichen planus, alveolar osteitis, and apthous ulcers [8] . Because of anthra quinine, gel inhibits the growth of S. pyogens and E. faecalis [8] . In a small amount of time, gutta-percha cones from S. aureus, E. coli, and E. faecalis were successfully disinfected using aloe vera gel [9] . In primary teeth, endodontic therapy using a zinc oxide powder and aloe vera gel mixture has demonstrated good radiographic and clinical results [10] .

Azadirachta aindica (Neem)

It is known as Indian neem tree having medicinal property by each part of the tree. It has anti viral, anti fungal, anti bacterial and anti carcinogenic activity [11] . Nimbidin is a major active component isolated from seed of A. indica. From nimbidin other constituents like nimbin, nimbinin, nimbidinin, nimbolide and nimbidic acid has been isolated which are responsible for its biological activities [12] . The dental gel containing Neem extract was responsible to reduce plaque index and bacterial count significantly [13] . The antimicrobial effects of Neem have been reported against *S. mutans*, *E. faecalis* and *C. albicans* [14] . The Minimum Inhibitory Concentration (MIC) of the aqueous neem extract were 1.88%, 7.5% and 3.75 % for *E. Faecalis*, *S. Mutans*, *C. albicans* respectively [14] . Leaf extract has significant antimicrobial effect against *E.faecalis* derived from infected root canal samples thus can be used as an alternative to sodium hypochlorite [15] .

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Acacia nilotica (Babool)

Acacia nilotica also known as the gum Arabic tree, possesses good anti microbial, anti oxidant, anti fungal, anti viral and antibiotic activity [16,17] . It contains tannins, phenolic compounds, essential oil, and flavonoids which are responsible for antimicrobial activity [18] . Babul plant has medicinal used as anticancer, anti tumours, antiscorbutic, astringent, anti-oxidant, natriuretic, antispasmodial, diuretic, diarrhea, malaria, sore throat and toothache [18] . Babool has antibacterial activity against *S. mutans* and *E. faecalis* [19] . It was found that babool at a concentration of 50% had the highest activity against *E.faecalis*[19] .

Arctium lappa

Arctium lappa is widely used in popular medicine all over the world for its well-known therapeutic applications. A. lappa showed the significant antimicrobial activity against microorganisms specifically found in endodontic infections [20]. It was used as intracanal medicament in teeth infected with *C. albicans, S. mutans, E. coli, P. aeruginosa and L. acidophylus*, was showed inhibition of microbial growth after 14 days [20] . Similarly the phytotherapeutic agent extracted from A. Lappa inhibited the growth of *S. mutans*, C. albicans, *E. coli*, *P. aeruginosa* and *L. acidophilus*, [21] .