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Research Paper

ALTERNATIVE MEDICINE IN THE MANAGEMENT OF ORAL MUCOSAL LESIONS- A REVIEW

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ABSTRACT **The term Alternative Medicine is used to denote a form of medicine that falls outside the main stream of western medicine. These kinds of medicines exist in all cultures to some ome degrees and terms such as traditional medicines, indigenous medicines, holistic medicines, folk medicines and oriental medicines are used. These medicines when used in dentistry, the term holistic dentistry is used. Alternative medicines or therapy encompasses a variety of disciplines including acupuncture, chiropractic treatment, guided imagery, yoga, biofeedback, hypnosis, aromatherapy, herbal remedies, relaxation, massage etc. There is common patient belief that these therapies are safe to use. However, there is lack of sufficient scientifically proved data regarding their safety and proven to be effective for a specific condition. The emphasis with most alternative therapies is based upon the natural healing capability of the body. This article emphasis the use of various alternative therapies, their advantages, mechanism of actions, side effects and implications in dentistry.**

KEYWORDS :Alternative medicine, Anti-oxidant, Herbal medicines, Holistic, Oral

INTRODUCTION

Alternative therapy is a generalized term applied to all methods of treating a disease or condition. This therapy aims at co-operating with the natural forces and various defensive mechanism of the body against pathogens. W.H.O has identified more than 150 systems of alternative medicines. Most practiced ones are : Ayurveda, Homeopathy, Naturopathy, Unani medicine, Magneto therapy, Aroma therapy, Acupuncture, Yoga, Biofeedback Training, Mud Therapy, Massage therapy etc.

Complementary and alternative medicine (CAM), according to **National Center for Complementary and Alternative Medicine (NCCAM)**, represents a group of diverse medical and health care systems, practices, and products that are not presently considered to be part of the conventional medicine. **Complementary medicine** is used together with conventional medicine. Example: Using aromatherapy to help reduce patient's discomfort following surgery.

Alternative medicine is used in place of conventional medicine. Example: Using a special diet to treat cancer instead of undergoing surgery, radiation, or chemotherapy that has been recommended by a conventional doctor.

National Center for Complementary and Alternative Medicine (NCCAM) classifies CAM therapies into five categories 1, 2

- Alternative Medical Systems.
- Mind-Body Interventions.
- Biologically Based Therapies.
- Manipulative and Body-Based Methods.
- Energy Therapies.

1. Alternative medical systems – These systems are built as a result of various theories and consequently practice and expertise. They are evolved apart from and earlier than the conventional medical approach in treating various diseas Divided into therapies that fall into **western culture** (Homeopathic and Naturopathic medicine) and **Non-Western cultures** (Traditional Chinese medicine and Ayurveda).

2. Mind-Body Interventions – The connection between the mind and the body uses a variety of techniques designed to enhance the mind's capacity to affect bodily function and symptoms. Example: Meditation, prayer and therapies that use creative outlets such as art, music, or dance.

3. Biologically based therapies- These therapies uses natural substances such as herbs and vitamins to cure a diseas Example: Dietary supplements, herbal products and the use of other natural but as yet scientifically **unproven** therapies (Example, using shark cartilage to treat cancer).

4. Manipulative and Body-Based Methods –These methods are based on manipulation and/or movement of one or more parts of the body. Example: Chiropractic or osteopathic manipulation and massag

5. Energy therapies - Energy therapies involve the use of energy fields. They are of two types:

a) Biofield therapies: The biofield therapies are intended to affect energy fields that surround and penetrate the human body. However, the existence of such fields has not yet been scientifically proven. Some forms of energy therapy manipulate biofields by applying pressure and/or manipulating the body by placing the hands in, or through, these fields. Examples include qigong, Reiki and Therapeutic touch.

b) Bioelectromagnetic based therapies: Unconventional use of electromagnetic fields such as pulsed fields, magnetic fields, or alternating-current or direct-current field

The use of alternative medicine aims at prevention of a disease whereas traditional medicine tends to intervene once disease is present.

Alternative medicines when compared with traditional medicine has lesser side effects and less expensive since most of them are manufactured using plant extracts. However, there is very little scientifically proven data regarding their safety when compared to traditional medical methods.

Alternative therapies commonly used in management of oral mucosal lesions.

1) Aloe vera- The name Aloe vera derives from the Arabic word "Alloeh" meaning "shining bitter substance," while "vera" in Latin means "true."

The botanical name of Aloe vera is ***Aloe barbadensis miller.*** It belongs to Liliaceae family.

Constituents of Aloe vera

Vitamins: It contains antioxidant vitamins such as A, C and E. It also contains vitamin B12, folic acid, and

choline.

Enzymes: It contains enzymes such as : alkaline phosphatase, amylase, bradykinase, carboxypeptidase, catalase, cellulase, lipase, and peroxidase. Bradykinase helps to reduce excessive inflammation when applied to the skin topically, while others help in the breakdown of sugars and fats.

Minerals: It contains calcium, chromium, copper, selenium, magnesium, manganese, potassium, sodium and zinc. They are essential for the proper functioning of various enzyme systems in different metabolic pathways.

Sugars: It contains monosaccharides (glucose and fructose) and polysaccharides (glucomannans, Acemannan)

Anthraquinones: It has12 anthraquinones, which are phenolic compounds traditionally known as laxatives. Aloin and emodin act as analgesics, antibacterials and antivirals.

Fatty acids: It provides 4 plant steroids; cholesterol, campesterol, β-sisosterol and lupeol. All these have anti- inflammatory action and lupeol in addition possesses antiseptic and analgesic properties.

Mechanism of action

a) Healing properties: Glucomannan, a mannose-rich polysaccharide, and gibberellin, a growth hormone, interacts with growth factor receptors on the fibroblast, thereby stimulating its activity and proliferation, which in turn significantly increases collagen synthesis.3

b) Effects on skin exposure to UV and gamma radiation: Topical application of aloe vera in gel form result in generation of metallothionein (Antioxidant) scavenges hydroxyl radicals and prevents suppression of glutathione peroxidase and superoxide dismutase which inturn decreased production and release of IL-10 which prevent UV-induced suppression of delayed type hypersensitivity.

c) Anti-inflammatory action: Aloe vera inhibits the COX pathway and reduces PGE2 production from arachidonic acid.

d) Effects on the immune system: Alprogen inhibit calcium influx into mast cells, thereby inhibiting the antigen-antibody mediated release of histamine and leukotriene from mast cells.

e) Antiviral and antitumor activity: These actions may be due to indirect or direct effects. Direct effect is due to anthraquinones. The anthraquinone inactivates various enveloped viruses such as herpes simplex, varicella zoster and influenza while indirect effect is due to stimulation of the immune system.

An induction of glutathione S-transferase and an inhibition of the tumor-promoting effects of phorbol myristic acetate has also been reported which suggest a possible benefit of using aloe gel in cancer chemoprevention.4

Indications in oral mucosal lesions: Aloe vera may be indicated in the management of Recurrent aphthous stomatitis , Lichen planus, Radiation mucositis, OSMF, Leukoplakia.

Oral lichen planus

A randomized controlled trial study was conducted to check the efficacy of Aloe vera gel in the treatment of oral lichen planus (OLP). The author concluded that Aloe vera gel is statistically significantly more effective than placebo in inducing clinical and symptomatological improvement of OLP. Therefore, Aloe vera gel can be considered a safe and alternative treatment for patients with OLP. 5

Oral submucous fibrosis

A study was conducted in 2012 to compare the efficacy of antioxidants and aloe vera in treatment of OSMF, where the subjects under the Aloe vera group showed a better treatment response compared to the antioxidants group. It reduced the burning sensation and also improved mouth opening. 6

Recurrent aphthous stomatitis

The authors conducted a double-blind clinical trial to evaluate the topically administered *A. vera* gel on oral cavity minor aphthous. It was concluded that *A. vera* 2% oral gel is not only effective in decreasing the patient's pain score and wound size, but also decreased the aphthous wound healing period. 7

Side effects: Topical application may cause redness, burning, stinging sensation and rarely generalized dermatitis in sensitive individuals. Allergic reactions are mostly due to anthraquinones such as aloin. When administered orally may cause abdominal cramps, diarrhea, constipation, red urine and hepatitis,

2) Curcumin

Curcumin (diferuloylmethane) is the chief component of the spice turmeric and is derived from the rhizome of the East Indian plant *Curcuma longa*. Turmeric contains a class of compounds known as the curcuminoids, comprised of curcumin, demethoxycurcumin and bisdemethoxycurcumin. Curcumin has anti-oxidant, antiseptic, analgesic, antimalarial and anti-inflammatory properties

Antioxidant Activity:

i) Curcumin has been shown to inhibit lipid peroxidation using linoleate, a polyunsaturated fatty acid that is able to be oxidized and form a fatty acid radical. It also scavenges various reactive oxygen species (ROS) produced by macrophages (superoxide anions, hydrogen peroxide and nitrite radicals). 8

ii) Down regulates the Nitric oxide synthase (iNOS) activity in macrophages, thus reducing the amount of ROS generated in response to oxidative stress. 9

Anti-inflammatory Activity :

Curcumin supresses the activation of NF-kB, an inducible transcription factor that regulates the expression of a host of genes involved in the inflammation such as COX-2, TNF-a, Cyclin –D1, ICAM-1. 10

Indications in dentistry: Recurrent aphthous stomatitis

Studies have shown that in patients who used conventional antiseptic gel, the lesion healed only after the period as in previous attacks. They experienced no early reduction in pain or frequency of recurrence. Patient noticed there is a decline in the pain and also the curcumin oil initiated healing effects on ulcers at an earlier stage of the application. A follow-up for 1 year has shown no recurrence in these patients. 11

Precancerous lesions

Curcumin has a crucial role in the management of precancerous conditions like lichen planus, oral submucous fibrosis and leukoplakia. Various in vitro and in vivo animal experiments activities of turmeric extract oil have demonstrated. Symptoms of pain and burning sensation were decline and mouth opening was also reversed partially. 11

Dosages - Doses of 500-8,000 mg of powdered turmeric per day have been used in human studies. Standardized extracts are typically used in lower amounts, in the 250-2,000 mg range. 12

Adverse effects: May cause gastric irritation, stomach upset, nausea, diarrhoea, allergic skin reaction, and anti- thrombosis activity interfering with blood-clot formation in some patients.

3) Allicin

The word Allicin is derived from the Latin name of the garlic plant, Allium sativum.

Anti microbial action: Allicin has been reported to inhibit the growth of gram positive, gram-negative, and acid-fast bacterium, including multidrug-resistant bacterium by its chemical reaction with thiol groups of various enzymes, especially the oral bacteria in vitro.13 It also possess some degree of immunomodulatory effect by increasing the activity of natural killer cell. It inhibits TNF-alpha -induced secretion of IL-1, IL-8, IFN-ɣ in a dose dependent manner . It also suppresses the expression of IL-8 and IL-1. 14

Indications in dentistry: Recurrent apthous ulcer

Oral adhesive tablets (5 mg allicin): which can adhere to the oral mucosa and release allicin slowly at the site of the ulcer in 3 to 4 hours. In this way, a higher drug concentration and a longer-lasting release period could be achieved at the affected site to increase the efficacy.15

Side effects- Increases bleeding- should be stopped 2 weeks before surgery It can irritate GI tract -should be used in caution in digestive problem. Decreases Blood pressure. 16

4) Green tea- Green tea is made from unoxidized leaves and is one of the less processed types of tea and therefore contains one of the most antioxidants and beneficial polyphenols mainly catechins.

Constituents -Catechins (30 %), Caffeine, Vitamins (A, B2,E, Folic acid, B-carotene), Saponins , ɣ- aminobutyric acid, Minerals (Potassium, calcium, phosphorus, manganese) , Chlorophyll

Actions

i) Antioxidant: it has antioxidant activity either directly by scavenging of reactive oxygen and nitrogen

species or indirectly by inhibition of redox sensitive transcription factors, and induction of antioxidant enzymes. 17

ii) Antitumor effect : EGCG (epigallocatechin gallate) has shown to induce apoptotic cell death and cell cycle arrest in tumor cells. 18

iii) Antimicrobial activity: Catechins constitute the most important antibacterial agents on methicillin resistant Staphylococcus aureus, Helicobacter pylori and α-Hemolytic streptococcus. 19

Indications :

Oral lichen planus

Green tea, especially epigallocatechin-3-gallate, possesses anti-inflammatory and chemopreventive properties. It can inhibit antigen presentation, T-cell activation, proliferation and migration, keratinocyte apoptosis, nuclear factor-kappaB (NF-κB) activation and MMP-9 activity and can modulate the imbalance between TGF-β and interferon-γ signaling, all of which are involved in the pathogenesis of OLP. 20

Candidiasis

These results indicate that EGCG enhances the antifungal effect of amphotericin B or fluconazole against antimycotic-susceptible and -resistant *C.* albicans. Combined treatment with catechin allows the use of lower doses of antimycotics and induces multiple antifungal effects. 21

Side effects: Drinking more than 5 cups a day is unsafe.

It can cause side effects because of the caffeine. These side effects can range from mild to serious and include headache, nervousness, sleep problems, vomiting, diarrhea, irritability, irregular heartbeat, tremor, heartburn, dizziness, ringing in the ears, convulsions, and confusion. 22 It increases the excretion of calcium in the urine leading to osteoporosis. Caffeine should be limited to less than 300 mg per day (2-3 cups). 22

5) Honey

Honey, a thick sweet liquid made by bees from the nectar of flowers, is one of the oldest known medicines.

Properties

Hygroscopic properties: This effect is based on high osmotic properties so it can extract water from bacterial cells and cause them to die. It has been shown that wounds infected with Staphylococcus aureus are quickly rendered sterile by honey

Acidic pH: Honey is characteristically quite acidic, its pH being between 3.2 and 4.5, which is low enough to be inhibitory to many animal pathogens

Increased lymphocyte and phagocytic activity: Honey (at a concentration of 1%) stimulates monocytes in cell culture to release cytokines, Tumour Necrosis Factor (TNF)-alpha, interleukin (IL)-1 and IL-6, which activate the immune response to infection. 23

In a study, honey application reduced inflammation, accelerated healing process and increased the pain free days in those lesions with resolution of the erythema or ulceration without need for steroid therapy. The mean healing period in RAS was 4 days which is lower than the previous reported studies. 24 In the same study, application of honey in the prodromal period, in one case, accelerated healing process with resolution of erythema and tingling sensation and prevented vesicular eruption. When it was applied after eruption of vesicles, in other cases, there was rapid resolution of the vesicles with no crust formation within 8 days. 24

Denture stomatitis

A study was conducted to evaluate the clinical efficacy of new Brazilian propolis gel in the treatment of denture stomatitis. Patients were divided into two groups -one group treated with brazilian propolis gel and other group with miconazole gel. Both the group showed almost equal results. 25

Anti tumor effects of honey

Gribel and Pashinskii (1990) reported that honey revealed moderate antitumor and pronounced antimetastatic effects. Honey was also seen to potentiate the antitumor activity of 5 -fluorouracil and cyclophosphamide. 26

Wang et al. studied the anti-mutagenic effects of different types of honey against a commonly encountered dietary mutagen Trp-p-1 and found that all honeys exhibited significant inhibition of mutagenicity against this compound. 27

A study done on tumour development and metastasis in murine tumour models using various honey -bee products showed an important role in controlling tumour growth and metastasis in mammary carcinoma and a methylcholanthrene-induced fibrosarcoma in mouse. 28

6) Spirulina

Spirulina, or Arthrospira platensis, is a blue-green algae which

appears as long, thin, spiral threads. Spirulina contains a rich supply of protein (60-70 % dry weight), Carbohydrates, Iron, Vitamins (A, K and B complex), Carotenoids (β carotene, Zeaxanthin , Cryptoxanthin, Phycocyanin, Lutein, Xanthophylls.

The nutrients present in Spirulina boost the immune system and enhance the body's ability to generate new blood cells to prevent disease and cancer. 29

Mechanism of action :

β-carotene has antioxidant and anti-inflammatory activities – it inhibits the production of nitric oxide and PGE2 and suppresses the expression of COX-2, TNF-α and IL-1. Phycocyanin inhibits proinflammatory cytokine formation of TNFα, suppresses COX-2 expression and decreases PGE2 production. 30

Indications in dentistry: Oral submucous fibrosis-

A study was conducted on a group of patients with OSMF. The subjects were given spirulina 500 mg along with triamicolone 0.1%. After the end of 3 months the subjects showed significant improvement in burning sensations, mouth opening and painful ulcerations. 31

Leukoplakia

The evaluated the chemopreventive activity of Spirulina fusiformis (SF) (1 g/day for 12 mos) in reversing oral leukoplakia in pan tobacco chewers in Kerala, India. Complete regression of lesions was observed in 20 of 44 (45%) evaluable subjects supplemented with SF, as opposed to 3 of 43 (7%) in the placebo arm ($p < 0.0001$). 32

7) Homeopathy

The term homeopathy comes from the Greek word homoios, meaning similar, and pathos, meaning suffering or sickness. The basic law of homeopathy is "The law of similars." The law states that disease represents a disturbance in the body's ability to heal itself. "Remedies" are determined by noting the symptoms produced by large doses of a substance in a healthy individual and applying these substances in highly diluted doses to relieve the same symptoms.

8) Ignatia

It is a homeopathic medicine that is derived from the bean of a small tree that is native to the Philippine Islands and China. The tree belongs to the Loganiaceae family, and has long, twining, smooth branches. Ignatia homeopathic 30C in management of oral lichen planus (OLP).

A Single blind randomized control clinical trial was done on 30 consecutive patients with oral lesions consistent clinically and histologically with erosive and/or atrophic OLP were recruited. The patients were randomly divided into two groups to receive Ignatia or placebo. They were treated for 4 months. Mean lesion sizes and mean pain measures differed between control and treatment groups favoring Ignatia. 33

CONCLUSION

The complementary and alternative medicines along with various other extracts from the plants together along with main stream of western medicines can be used as preventive or treatment modalities for oral mucosal and precancerous lesions. The dentist needs to be informed regarding the use of herbal products that may have an impact the delivery of safe and effective dental treatment. In addition, the use of CAM treatments in dentistry should be based on evidence of effectiveness and safety as demonstrated in randomized clinical trials.

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