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Review Article

ALOE VERA: NOVEL PROTAGONIST IN PERIODONTAL HEALING

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ABSTRACT

Aloes have been used therapeutically, certainly since the Roman times and perhaps long before. Aloe vera (synonym: Aloe barbadensis Miller) belongs to the Liliaceae family, of which there are about 360 species. It has been used therapeutically. Recent interest and current in the field of alternative and ayurvedic medicine has promoted the use of various herbal and natural products for multiple uses in the field of medicine in various treatments. The aloe vera plant has a long history of healing power. Now a days its used in dentistry and periodontology is common and have vital role in healing.

Keywords: Aloe Vera, Herbal Products, Healing, Periodontology

INTRODUCTION

Aloes have been used therapeutically, certainly since the Roman times and perhaps long before^{1,2}. Aloe vera (synonym: *Aloe barbadensis Miller*) belongs to the *Liliaceae* family, of which there are about 360 species. It has been used therapeutically³. Recent interest and current in the field of alternative and ayurvedic medicine has promoted the use of various herbal and natural products for multiple uses in the field of medicine in various treatments. ⁴The aloe vera plant has a long history of healing power. Its ability to heal burns and cuts and soothe pains well as in dermatological field has been documented as far back as the 10th century⁵.

Over the last decade, herbal and Ayurvedic drugs has become a subject of world importance, with both medicinal and canonical implications. There are number of traditional herbal remedies for the treatment and management of diseases related to teeth, gum and oral hygiene. Aloe Vera Original, AVO, has been developed in Sweden with Swedish Dental experts from hospital clinical surgeons and dentists to university teams researching the cure for these ailments, foremost being the internationally renowned experts Professor Lars G. Pettersson and Professor Doven Birkhed of Sweden.

It suppresses and relieves inflammation and also helps greatly the many who suffer from for instance Aphthous ulcer, canker sores. Thanks to the high concentration of pure *Aloe Vera Barbadensis Miller*, 45%, the use of the toothpaste shows noticeable results in a very short time on treated gum disease.⁶ Ideal environment to grow this plant is tropical climate and low-rainfall areas. fig:1 and 2

The Aloe vera leaf consists of 2 different parts: central mucilaginous part and peripheral bundle sheath cells. The parenchymal tissue makes up the inner portion of the aloe leaves and produces a clear, thin tasteless jelly-like material called Aloe vera gel⁴.

History:

Aloe Vera has been used medicinally since the last few thousand years. History states that wars have been fought, as by Hannibal, in order to obtain control over its growing area in North Africa around 1750 BC. Its uses are mentioned in various books and Mesopotamian clay tablets in various countries like Egypt, Greece,⁷ South Africa, India, China, Mexico, Japan⁴ for various ailments like burns, hair loss, skin infections, hemorrhoids⁶, sinusitis, gastrointestinal (GI) pain. It is also a wound healer for bruises, x-ray burns⁵, insect bites; and anti-helminthic, somatic, anti-arthritis^{7,8}.

Aloe vera is a handy home remedy that can be used as a moisturizing agent.⁹ Aloe vera has been used for various skin conditions, including radiodermatitis, frostbite, psoriasis and genital herpes infection with good results. Reported pharmacological actions of Aloe vera include anti-inflammatory,⁵ antibacterial, antioxidant, antiviral and antifungal actions, as well as producing hypoglycemic effects.² Dental uses of Aloe vera are multiple. It is extremely helpful in the treatment of gum diseases like gingivitis, periodontitis.³ It reduces bleeding, inflammation and swelling of the gums. It is a powerful antiseptic in pockets where normal cleaning is difficult, and its antifungal properties help greatly in the problem of denture stomatitis, aphthous ulcers, cracked and split corners of the mouth. It is a powerful healing

promoter and can be used following extractions. It has been used in root canal treatment as a sedative dressing and file lubrication during biomechanical preparation.

Various forms of Aloe Vera used:

1. As a toothpaste, mouthwash¹
2. As gel for promoting healing in burns, stings, insect bites and many skin lesions; it protects and promotes healing⁴As Aloe activator topical spray, which is used for throat infections, painful teeth eruptions and joint pains
3. Aloe vera juice, which is taken systemically as a drink for irritable bowel syndrome and as a strong detoxifying agent. It also acts as neurosedative and an immune enhancer
4. As powerful nutritional supplement and antioxidant.

GENERAL USE AND MEDICINAL VALUE:

Different parts of the plant are used for different effects on the body and Aloe Vera has both internal and external applications. Aloe Vera contains over 200 active components including vitamins, minerals, amino acids, enzymes, polysaccharide, and fatty acids- no wonder it's used for such a wide range of remedies. The bulk of the Aloe Vera leaf is filled with a clear gel-like substance, which is approximately 99% water. Man has used aloe therapeutically for over 5000 years. The list of benefits and effects for this miraculous plant are many.⁷

Benefits and Medicinal Uses for Aloe Vera:⁸

1. Aloe Vera Is High in Vitamins & Minerals:

Aloe Vera contains many vitamins including A, C, E, folic acid, choline, B1, B2, B3 (niacin), B6. Aloe Vera is also one of the few plants that contains vitamin B12. Some of the 20 minerals found in Aloe Vera include: calcium, magnesium, zinc, chromium, selenium, sodium, iron, potassium, copper, manganese.

2. Aloe Vera is High in Amino Acids & Fatty Acids:

Amino acids are the building blocks of protein. There are about 22 amino acids that are necessary for the human body and it is said that 8 of these are essential. Aloe contains three plant sterols, which are important fatty acids- HCL cholesterol (which lowers fats in the blood), campesterol, and B-sitosterol. All are helpful in reducing symptoms of allergies and acid indigestion. Other fatty acids include linoleic, linolenic, myristic, caprylic, oleic, palmitic, and stearic.

3. Aloe Vera is an Adaptogen:

Aloe Vera is a well-known adaptogen. An adaptogen is something that boosts the body's natural ability to adapt to external changes and resist illness. It is thought that aloe's power as an adaptogen balances the body's system, stimulating the defense and adaptive mechanisms of the body. This allows you an increased ability to cope with stress (physical, emotional and environmental stress like pollution)

4. Aloe Helps with Digestion:

Poor digestion is related to many diseases. Aloe is known to soothe and cleanse the digestive tract and help improve digestion. The interesting thing about taking aloe internally is that, because it is an adaptogen, it helps with either constipation or diarrhea, helping to regulate your elimination cycles in whatever way you need. It's been a great remedy for

people with problems such as irritable bowel syndrome as well as acid reflux.

5. Aloe Helps in Detoxification:

Aloe Vera is a gelatinous plant food, just like seaweeds . The main benefit to consuming gelatinous plant foods in your diet is that these gels move through the intestinal tract absorbing toxins along the way and get eliminated through the colon. This will help the proper elimination of waste from your body and help the detoxification of your body.

6. Aloe Alkalizes the Body:

Disease cannot manifest in an alkaline environment. Most people are living and subsisting on mostly acidic foods. For great health, remember the 80/20 rule – 80% alkaline forming foods and 20% acidic. It alkalizes the body, helping to balance overly acidic dietary habits

7. Cardiovascular Health:

There hasn't been a lot of studies conducted in this but there has been some research to show that Aloe Vera extract injected into the blood, greatly multiplies the oxygen transportation and diffusion capabilities of the red blood cells. According to a study published in the 2000 issue of the British Medical Journal, beta sitosterol helps to lower cholesterol. By regulating blood pressure, improving circulation and oxidation of the blood, lowering cholesterol, and making blood less sticky, Aloe Vera juice may be able to help lower the risk of heart disease.

8. Aloe Helps Boost the Immune System:

I think given the stresses of our daily lives, every one can use a boost to their immune systems. Aloe is also an immune enhancer because of its high level of anti-oxidants, which help combat the unstable compounds known as free-radicals, contributing to the aging process. (Free radicals are a bi-product of life itself, it is a naturally occurring process but we can overload ourselves with unnecessary free-radicals by living an unhealthy lifestyle) Aloe is also an antipyretic which means it used to reduce or prevent fever.

9. Aloe Vera is great for the Skin:

Because of aloe's well-known healing properties for the skin, aloe is one of the primary compounds used in the cosmetic industry. It is a known vulnerary, (meaning it helps heal wounds) and is great for applying topically to burns, abrasions, psoriasis and even to bug bites. Aloe acts as an analgesic, acting to help relieve pain of wounds. It's feels especially good to cut a stem of aloe, place it in the fridge and rub it on sun burnt skin – the immediate soothing effect feels like an absolute lifesaver. Aloe is also an antipruritic: A substance that relieves or prevents itching. Aloe Vera is an astringent: which causes the contraction of body tissues, typically used to reduce bleeding from minor abrasions.

10. Disinfectant, Anti-biotic, Anti-microbial, Germicidal, Anti-bacterial, Anti-septic, Anti-fungal & Anti-viral:

Aloe Vera's active ingredients are sulphur, lupeol, salicylic acid, cinnamic acid, urea nitrogen and phenol which are substances that prevent the growth of disease-causing microorganisms and act as a team to provide antimicrobial activity thus eliminating many internal and external infections, also active against bacteria. It also helps to treat fungal and viral infections.

11. Aloe Helps Reduce Inflammation:

Aloe Vera contains 12 substances, including B-sisterole, which can help to slow down or inhibit inflammation. This may be able to help with painful joints due to stiffness and help improve joint flexibility.

12. Weight Loss – A Secondary effect:

Improving your digestion, and detoxifying your will have a secondary effect in promoting weight loss because when we start to improve our digestion we naturally eliminate more efficiently, which is a primary way they we detoxify – through our bowels. This will lighten our toxic load on the body and will give us more energy.

ALOE VERA INTAKE PRECAUTIONS:

1. This plant is incredibly medicinal, yet there are some cautions against long-term use. Just because a little is beneficial, doesn't mean that a lot is more beneficial. This is an incredibly potent herb and should be used with a level of respect for its potency. Long-term use can lead to loss of electrolytes, especially potassium.
2. Avoid taking aloe internally during pregnancy, menstruation, if you have hemorrhoids or degeneration of the liver and gall bladder.
3. Aloe vera tooth gel is intended to perform the same function as toothpaste, which is to eliminate pathogenic oral microflora disease-causing bacteria in the mouth.

DENTAL APPLICATION:

There are eight main uses of aloe vera in dental practice:

1. Applications directly to the sites of periodontal surgery.
2. Applications to the gum tissues when they have been traumatized or scratched by toothbrush-dentifrice abrasion, sharp foods, dental floss, and toothpick injuries.
3. Chemical burns are relieved quickly from accidents with aspirin.
4. Extraction sites respond more comfortably and dry sockets do not develop when aloe vera is applied.
5. Acute mouth lesions are improved by direct application on herpetic viral lesions, aphthous ulcers, canker sores, and cracks occurring at the corners of our lips. Gingival abscesses are soothed by the applications as well.
6. Other oral diseases chronic in nature respond with Lichen Planus and Benign Pemphigus. Even gum problems associated with AIDS and Leukemia patients receive relief. Migratory glossitis, geographic tongue and Burning Mouth Syndrome are improved.
7. Denture patients with sore ridges and ill-fitting dentures and partials can benefit as fungus and bacterial contamination reduce the inflammatory irritations.
8. Aloe vera can also be used around dental implants to control inflammation from bacteria contamination.
9. Other oral disorders such as Candidiasis, Desquamative Gingivitis, Vesiculobullous diseases, acute monocytic leukemia, hematological disorders and nutritional problems all respond to aloe vera use. Even diabetes mellitus, Sjorgen's Syndrome, menopausal patients and medications which can cause Xerostomia or dry mouth.
10. Aloe latex contains anthraquinones, which are chemical compounds that are used in healing and arresting pain because they are anti-inflammatory in nature. But, because aloe vera tooth gel tends to be less harsh on teeth, as it does

not contain the abrasive elements typically found in commercial toothpaste, it is a great alternative for people with sensitive teeth or gingiva.

11. It suppresses and relieves inflammation and also helps greatly the many who suffer from for instance Aphthous ulcer, canker sores. Thanks to the high concentration of pure Aloe Vera Barbadensis Miller, 45%, the use of the toothpaste shows noticeable results in a very short time on treated gum disease. Furthermore, the bacterial inhibitory substance propolis has been added. This is a natural substance used by bees for the sterilization of beehives and has a major contributing effect on the healing of periodontal disease. One side-effect of this combination of natural ingredients is that you will find almost no trace of tartar after having used this toothpaste for a period of at least two months, and tartar being one of the contributing factors to receding gums and the onset of periodontal disease.[9]
12. Aloe Vera Original, uses a very mild foaming agent, **Sodium Lauroyl Sarcosinate**, that moistens the gums and provides relief in that its antibacterial agent, propolis, will assist the Aloe Barbadensis Miller in fighting the bacteria causing gum and periodontal disease. The toothpaste leaves the teeth with a very smooth feeling which also prevents plaque and bacteria from attaching to the teeth, once again a very effective preventive action against periodontal disease. In Sweden AVO is used by surgical clinics after dental surgeries for its outstanding and healing properties and most people who start using it swear by its fantastic properties. Fluoride is added in a unique combination which leaves both the Aloe Barbadensis Miller and the fluoride free to do its work, which is to help you back to a fresh healthy mouth.
13. Periodontal disease will eventually lead to the loss of your teeth and leaving you with few options which are very costly and painful. This type of disease is very common and of course not only the toothpaste plays a part in your improved gum health and declination of your periodontal disease. It is quite possible to stop your problems using the help of Aloe Vera toothpaste together with the advice given to you by your dentist regarding how best to clean your teeth using floss and electric toothbrush. AVO, Aloe Vera Original is manufactured in Scandinavia following all ISO-standards. It contains 1,400 ppm fluoride and following our clinical study it has been proven to have 100% free effect to work, this meaning that the fluoride and aloe vera coexist perfectly, giving each other a boosting synergy effect leading to such fantastic results when treating gum disorders and periodontal disease.

PERIODONTAL POINT OF VIEW, CURRENT CONCEPT AND MECHANISM:

Figure : 7 application of aloe vera gel in periodontal flap case it will healing of flap.

Aloe vera is also use to treat gingivitis, Treatment of periodontal diseases by different types of local delivery systems has been investigated.^{1,10}

Periodontitis is an infectious inflammatory disease. Bacteria modulate the inflammatory response and alter the diversity of periodontal disease. Aloe vera is a cactus plant that belongs to

the Liliaceae family. More than 360 species of aloe plants exist, but only 2 species have been studied, which are Aloe barbadensis Miller and Aloe aborescens.²

Aloe Vera has been shown to enhance defense mechanisms, and it has a variety of components to help combat periodontal disease and other oral conditions. As a periodontist utilizing aloe vera in various consistencies for the last 14 years with over 6,000 documented patients who have been treated with applications, I've observed remarkable healing, reduced edema, and pain control.

DISCUSSION

Aloe vera used in pocket area has significant reduction in pocket depth when compared to controls and reduction in gingival index, which can be attributed to its anti-inflammatory, antibacterial, wound-healing properties. Aloe vera has numerous anti-inflammatory agents. Fujita *et al*, stated that carboxypeptidase in Aloe vera inactivates bradykinin by about 67% and relieves pain. Rocio Bautista in 2004 showed that carboxypeptidase in Aloe vera had good anti-prostaglandin synthesis properties and compounds inhibiting oxidation of arachidonic acid, which might decrease inflammation.¹¹ Aloe vera contains salicylate magnesium lactate decarboxylase, which is known to inhibit histidine, thereby preventing the formation of histamine from histidine in mast cells. Heggars and Robson in 1983 showed that barbolin and aloe emodin in aloe vera block prostaglandin (PG) synthesis. The decrease in gingival index can be attributed to presence of sterols as anti-inflammatory agents and lupeol as an antiseptic analgesic. Vazquez *et al*, stated Aloe vera decreases edema and number of neutrophils and also prevents migration of Poly morpho nuclear leucocytes (PMNL). Barrantes and Guinea in 2003 stated Aloe vera inhibits the stimulated granulocyte Matrix metallo proteinases (MMPs) inhibiting cyclo-oxygenase and lipo-oxygenase pathways. Payne,³ reported Aloe vera gel used in wound site lessened inflammation with less pain. Hart *et al*, in an *in vitro* study stated Aloe vera depleted the chemical and alternative pathways of complement activity to inhibit the production of free oxygen radicals by activated Poly morpho nuclear leucocytes (PMNs). Aloe vera is also shown to provide relief in swelling, bleeding gums and is an antiseptic for pockets and antifungal for thrush.^{1,11}

The low plaque index observed in these subjects could be explained by the fact that Aloe vera is a good antibacterial. Hegger *et al*, showed its antibacterial properties against *Candida albicans*, *Streptococcus pyogens*, *Streptococcus fecalis*. Noskova, used Aloe vera to treat early stages of periodontitis and got good results.

Davis, who stated that wound healing with Aloe vera was due to increased blood supply; increased oxygenation, which stimulates fibroblast activity; and collagen proliferation. Davis, in *in vitro* and *in vivo* studies showed healing with fibroblast proliferation. Wound healing by means of growth factors such as gibberellins, auxin and mannose phosphate,

which bind to insulin-like growth factor receptor to improve healing, is also seen. Yagi *et al*, stated presence of glycoprotein with cell proliferation improves healing. Aloe vera also contains vitamins A, C, E, B₁₂, folic acid. Vitamin C, which is involved in collagen synthesis, increases concentration of oxygen at the wound site because of dilation of blood vessels. Aloe vera penetrates and dilates capillaries going to an injured site, which improves healing.

Davis *et al*, showed that healing is better and wound tensile strength is increased after its application on wounds. Choonhakarn *et al*, used 70% Aloe vera gel for recurrent aphthous ulcers and lichen planus, which showed that healing was better and fast. Mandeville in 1939 used Aloe vera for the treatment of radiation ulceration of mucous membrane of the mouth.

CONCLUSION

Aloe vera has an unlimited future in new applications, and I sense in dentistry we are just on the cutting edge of promising utilization for anti-inflammatory procedure, antiviral, and immunological benefits for our patients.

REFERENCES

1. Crosswhite FS, Crosswhite CD. Aloe vera, plant symbolism and the threshing floor. *Desert Plants* 1984;6:43-50.
2. Morton JF. Folk uses and commercial exploitation of Aloe leaf pulp. *Econ Bot* 1961;15:311-9.
3. Neha Ajmera, Anirban Chatterjee. Aloe vera: It's effect on gingivitis, *Journal of Indian Society of Periodontology - Vol 17, Issue 4, Jul-Aug 2013:435-238.*
4. Geetha Bhat, Praveen Kudva, and Vidya Dodwad. *Journal of Indian Society of Periodontology - Vol 15, Issue 3, Jul-sept 2011:205-209.*
5. Tooth Gel: Healing Power Of Aloe Vera Proves Beneficial For Teeth And Gums, Too July 28, 2009.
6. dr.reuben titus,'aloe vera-the magical plant amongst US,
7. john heggars, M.D, http://www.miraclealoe.in/history_of_aloe_vera/history_of_aloe_vera.html
8. www.ncbi.nlm.nih.gov/sites/entrez CAM on PubMed@: nccam.nih.gov/research/camonpubmed/
9. B K Vogler and E Ernst: Aloe vera: a systematic review of its clinical effectiveness. *Br J Gen Pract.* 1999 October; 49(447): 823-828
10. DR. VIDYA DODWAD*, DR. SHUBHRA VAISH: local drug delivery in periodontics: a strategic intervention; *Int J Pharm Pharm Sci*, Vol 4, Issue 4, 30-34.
11. JaiDeep MahenDra, LittLe MahenDra: *Journal of Clinical and Diagnostic Research.* 2013 Oct, Vol-7(10): 2330-2333.



Figure 1: Aloe Vera gel



Figure 2: Press and Remove



Figure 3: Plant



Figure 4: Scraping with Spoon



Figure 5: Central Core



Figure 6: Core Material



Figure 7: Application of aloe vera gel in periodontal flap case it will healing of flap.

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