ALOEVERA: A BOON TO DENTISTRY

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ABSTRACT

Naturopathy is now gaining its significance as the treatment choice in the western countries. Due to its minimal side effects and highly effective treatment results naturopathy treatment is in vogue. Aloe vera is one such plant. The aim of the article is to highlight the uses of aloe vera in medicine and its potential use in dentistry.

Keywords: Aloe vera, anti inflammatory, oral lichen planus.

INTRODUCTION

Aloe vera is a stemless or very short-stemmed plant growing to 60–100 cm height and spreads by offsets. The leaves are very thick and fleshy, green to greyish-green, with some of the varieties showing white flecks on the upper and lower stem surfaces. Aloe Vera plant is known as Aloe Barbadensis Miller and is commonly known as Babosa which belongs to family Liliaceace. There are more than 300 species of aloe plants. Ideal environmental conditions for growth of this plant is tropical climate and low rainfall area.
The common names in which this plant is known are Indian Aloe, Chinese Aloe, True Aloe, Barbados, Burn Aloe. It is also as “Lily of the Desert” as it is commonly seen in arid [tropical environment].

Aloe vera plant contains all nutrients in its leaf which is required for its survival. It seal the wound and regenerate in a short time if the leaves got damaged. It is one of the most durable plant of mankind. The plant consists of two different parts. The inner portion of aloe leaf made by parenchymal tissue, from which aloe vera gel, a clear, thin, tasteless, jelly like material can be obtained. The part of plant consist of a group of specialized cells known as pericyclic tubules, which is seen beneath the outer green rind of the leaves. These pericyclic cells produces an exudates that consists of a bitter yellow latex which has a powerful laxative-like action. Plant is 99.5% water and remaining is active ingredients which includes essential oils, amino-acids, enzymes, minerals, and glycoproteins.

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CHEMICAL COMPOSITION

Lignins: Found in the pulp of the leaf gel. The lignin present in aloe vera is a woody substance, inert in itself, endows topical aloe preparations with this penetrative ability they carry other active ingredients deep into the skin to nourish the dermis.

Saponins: Saponins are soapy substances form 3 per cent of the gel. Glycosides that promote cleansing as they are general cleansers, and provide an antiseptic quality. These act powerfully as anti-microbials against bacteria, viruses, fungi and yeasts.

Anthraquinones: Anthraquinones are the phenolic compounds found in the aloe vera. The aloes consist of free anthraquinones and their derivatives. In large amounts these compounds exert a strong purgative effect, are potent antimicrobial agents and possess powerful analgesic effects. Topically, they can absorb ultra violet light, inhibit tyronase activity, reduces the formation of melanin and any tendency for hyper pigmentation.

Minerals: Act for the benefit of the overall health of our bodies and are interactive with the vitamins, co-enzymes and proteolytic enzymes.

Vitamins: Essential for maintenance of our health and function best as catalysing agents. Mono and Polysaccharides: (carbohydrates) Essential nutrients.
Vitamins present are—B1, B2, B6, Choline, Folic acid C, Alpha tocopherol, beta carotene.

**Amino Acids:** Building blocks for repair and regeneration of traumatised tissue Aloe vera gel provides 20 of the 22 necessary amino acids required by the human body and seven of the eight essential amino acids which the body cannot synthesis.

**ROUTE OF ADMINISTRATION**

It is currently available in the market as an external applicator like gel, oil, face powder, face wash and toothpaste.

**BIOLOGICAL EFFECTS**

A number of investigation has been attempted to relate the chemical constituents in aloe vera to specific biological effects. Some of the biological effects are:-

- Moisturizing property
- Wound healing property
- Anti-inflammatory property
- Antibacterial property
- Antifungal property
- Antiviral property
- Pain relief property
- Treatment of minor burns, skin abrasion and irriations
- Treatment of psoriasis and frostbite.

**Moisturizing property**

The moisturizing effect of aloe vera gel is due to the mix of water and polysaccharide components, creating a jelly-like consistency which can holds the water within the mix and minimizes its evaporation, thus providing a sustained moist environment when applied to the dry tissues and humectant properties which promotes retention of moisture in tissues.²

**Wound Healing effects**

Several mechanisms were proposed for the wound healing effects of aloe vera gel, which are

# keeping the wound moist
# increasing the cell migration
# rapid maturation of collagen and reduction in inflammation³
Angiogenesis is the growth of new blood capillaries and it is a part of tissue regeneration. In 1993 a study showed that topical application of aloe vera gel re-established vascularity of burn tissue of a guinea pig, although no specific constituents were identified.\(^4\)

Shelton et al\(^5\)(1991) proved presence of salicylates in the gel giving aspirin like effects.

**Anti-inflammatory property**

Three mechanisms which explains the anti-inflammatory property of aloe vera are\(^6\):

1. Fujita and Teradaira\(^7\) (1976) said that carboxypeptidase’s in aloe inactivate bradykinen which is a principle participant of inflammation.
2. Robson MC, Haggres WJ\(^8\) (1982) said that salicylates are by-products of amodin, aloe-emodin and aloin.
3. Klein AD\(^9\) (1980) said that magnesium lactate inhibits histidine decarboxylase, hence preventing the formation of histamine from histidine in mast cells.

More recent studies, the peptidase bradykinase was isolated from aloe and shown to break down the bradykinin, which is an inflammatory substance that induces pain\(^10\). The gel was found to have an effective anti-inflammatory effects as Prednisolone and Indomethacin, without having the long term toxicity of either drug\(^11\).

**Antibacterial / antifungal / antiviral effects:** Streptococcus pyogenes and Streptococcus faecalis are two microorganisms that have been inhibited by aloe vera gel\(^12\). Heggers et al suggested that the antibacterial effect of the aloe vera gel in vivo could enhance the wound healing process by eliminating the bacteria that contributed to inflammation.\(^13\) Candida albicans growth was inhibited by processed aloe vera gel preparation.

**USES OF ALOEVERA IN DENTISTRY:** The oral cavity is a breeding ground for bacteria. This can cause severe issues if proper oral hygiene is not maintained. These bacteria’s can attack gums and teeth and causes bad breath, gingivitis, stomatitis and periodontitis. Aloe vera has got an effective defence mechanism against bacteria and prevent these diseases.

Aloe vera has been used in dentistry in various forms such as gel, dentrificers, mouth rinses and irrigations. Some of the use of aloe vera in dentistry are\(^14,15\):

1) Application in periodontal surgery
2) Application over the traumatic injuries caused by toothpick, floss etc.
3) Patients with sore gums
4) Abscess is also reduced using aloe vera
5) Chemical burns

The various use of aloe vera in oral conditions are elaborated as follows:

**Apthous ulcer:** the studies has shown that acemannan hydrogel can accelerates the patients with the history of recurrent apthous ulcers were divided into 3 groups. Each groups were treated with different medicines ie; either acemannan hydrogel, freeze–dried acemannan hydrogel, or an un specified over-the-counter product as an active control, for four times a day. The groups using acemannan hydrogel in either forms healed faster than the control group. The report also showed that the acemannan hydrogel did not have any disagreeable taste and texture in comparison with other traditional remedies. Combined use of allantoin, aloevera, silicon dioxide and its effect on apthous ulcer was studied, where the results showed that there was reduced duration of lesion and increase in the interval of lesions.17

**Lichen planus:** in a study a patient suffering from oral lichen planus and systemic involvement was treated by giving 2 ounces of stabilized aloe vera juice for 3 months and additionally topical application of aloe vera lip balm and aloe cream for itching hands. The oral lesion healed by 4 weeks and systemic lesion took longer time to heal due to interruption in the treatment18.

**Halitosis:** as aloe vera is a natural antibacterial and antifungal agent it kills bacteria as well as fight tooth decay. Aloe vera boosts ability of body to produce collagen which strengthen swollen gums.

Pure aloe vera gel is taken 1/4 cup and is dissolved in 1/2 cup water or apple juice. This increases acid indigestion, which is a common cause for bad breath19.

**Aloe Vera in Extraction Site**20:- In this study they compared incidence of alveolar osteitis in patients in patients treated either with Clindamycin soaked gel form or SaliCept.

SaliCept patch is a freeze dried pledget Acemannan Hydrogel which is made from clear inner gel of aloe vera.

Results showed that acemannan gel reduced the incidence of alveolar osteitis significantly more compared to clindamycin soaked gel form.
CONTRAINDICATION
Aloe vera is contraindicated in intestinal obstruction, acute inflamed intestinal disease, eg; Crohn’s disease, ulcerative colitis (anyone with Crohn’s disease or ulcerative colitis considering using aloe vera should be cautioned that aloe vera, when taken orally, has a laxative effect. In addition, it has qualities of an “immune booster.” A person with Crohn’s disease or ulcerative colitis should be careful about treatments that can boost an already overactive immune system) , appendicitis and undiagnosed abdominal pain. Oral aloe vera is contraindicated in pregnancy due to theoretical stimulation of uterine contraction and in breast feeding mother, it can sometimes causes gastro intestinal distress in the infants. Oral use of aloe is also contraindicated in children under 10 years of age.

SIDE EFFECTS
Topically used aloe vera can cause redness, burning and stinging sensation in sensitive skins. Orally taken aloe vera can cause abdominal cramps, diarrhoea, red urine. Prolonged uses can increase the risk of colorectal cancer.

FUTURE PROSPECTS
Though aloe vera is a promising herb with its various clinical applications in medicine and dentistry, more clinical research should be undertaken so that it can establish in the field of medicine and dentistry.

REFERENCES