

Use of Aloe Vera and Turmeric Paste as a Supplementary Medicine in Oral Submucosal Fibrosis: A Pilot Study

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Abstract Oral submucosal fibrosis is the major health issue affecting 2.5 million Indian population under the age of 40 years. All the available treatments give only symptomatic relief which is short lived. The incidence of Oral submucosal fibrosis still rising alarmingly and there is a dire need to search for an effective and safe remedy because of lack of present therapies to either provide a complete cure or treating the patients at the cost of adverse effects. A total of 140 clinically diagnosed patients with Oral submucosal fibrosis (diagnosed on the basis of reduction in interincisal distance on maximum mouth opening and palpable fibrous bands involving oral mucosa) within the age range of 18–50 years with decreased interincisal opening were selected (time period 1.5 year). These patients were given Inj. Triamcinolone (40 mg) and Inj Hyaluronidase every 21 days. Pt was divided in 2 groups (each containing both males and females) those receiving Triamcinolone ointment alone BD (control) and those receiving Triamcinolone ointment BD along with turmeric & aloe vera paste combination (test). A statistically significant improvement was seen in both burning sensation and mouth opening in both males and females. The result of the study shows that the synergistic action of these herbs results in higher efficacy and highly potent Oral submucosal fibrosis treatment.

Keywords Oral submucosal fibrosis · Interincisal distance · Triamcinolone · Hyaluronidase · Aloe vera

Introduction

Throughout the human history, there are many concern for health care and the definite remedy of the disease, even though the process itself took a very long time to evolve into a body of knowledge. From time immemorial, we have been using our natural resources to attain the state of well-being, and it is becoming important in the developing world.

Aloe Vera

Aloe Vera- aloe term was originated from the Arabian word “alloeh” which means shiny and bitter, vera from the Latin language which means true or genuine. Commonly known as first aid plant because of its rejuvenating, healing or soothing properties. Aloe-Vera has vitamins, enzymes, minerals, amino acids, salicylic acids. It has anti-cancer, anti-inflammatory, anti-oxidant, anti-bacterial, anti-fungal, anti-viral, chemo-therapeutic, radio-protective properties [1, 2]. Because of all these properties aloe-vera is used to treat aphthous stomatitis, canker sores, oral lichen planus, oral submucous fibrosis, oral leukoplakia, herpes simplex infections, herpes zoster, oral candidiasis, benign pemphigus, geographic tongue, burning mouth syndrome, angular cheilitis, denture stomatitis and radiation induced mucositis.

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Turmeric

It is a rhizome of *Curcuma longa*, a flavourful yellow orange spice belonging to the family Zingiberaceae. It is a traditional medicine used from the ancient times as a dye, flavoring agent, for therapeutic and cosmetics. It is used in both Ayurvedic and Unani medications and the main ingredients are named curcuminoids, which include mainly curcumin (diferuloyl methane), demethoxycurcumin, and bisdemethoxycurcumin. It has anti-inflammatory, anti-oxidant, anti-microbial, neuro-protective, cardio-protective, thrombo-suppressive and anti-diabetic actions (4). Curcumin has a potent antitumor activity, it induce apoptosis and inhibits cell growth of the malignant cells. It is also associated with downregulation of nuclear factor b (NF-b), and expression of cyclooxygenase-2 (COX2), lipoxygenase (LOX), iNOS (inducible nitric oxide synthase), matrix metalloproteinase (MMP-9), tumor necrosis factor (TNF), chemokines and cyclin D1. It is available in powder, oil forms and used topically in treatment of oral lichen planus and oral submucousfibrosis. Curcumin inhibits the prostaglandin and leukotrienes and also has scavenging effect on superoxide radicals, hydroxyl radicals and lipid peroxidation. Furthermore, curcumin has been found to have fibrinolytic action and thus inhibits collagen synthesis [3, 4].

Science and Turmeric

Scientists have started realizing the usefulness of turmeric/curcumin in the treatment of various modern disease. Turmeric is considered to fight cancer in various ways: It neutralizes those substances and conditions which can lead to cancer; it helps the cell retain its integrity if exposed to carcinogen. If a tumor grow then the curcumins can often destroy it. There are numerous ways by which turmeric helps to downstage or prevent cancer. It happens due to the capability of curcumin to inhibit the enzyme Topoisomerase, which is used for the replication of cancer cells. "Topoisomerase acts on the nucleus of the cell, its first gets attached to the supercoiled DNA, it then cause transient double strand break which allows passage of one DNA helix through another, further allowing cell replication to occur. Therefore it stops Topoisomerase which will stop the replication, ultimately stopping the cancer" [5]. Curcumin is also natural COX-2 inhibitors, which inhibits the enzyme cyclooxygenase-2. This is useful since the COX-2 enzyme helps make carcinogens more active and allows cancer cells to survive by neovascularisation.

Oral Submucous Fibrosis

Oral Submucous Fibrosis (OSMF) is defined as an insidious condition affecting oral mucosa, pharynx, esophagus, causing dense collagen deposition in mucosa, submucosa. There is blanching and stiffness of oral mucosa, burning sensation, trismus, loss of gustatory sensation and loss of mobility of tongue. Majority of these cases are seen in Indian population [6].

The prevalence varies from 0.20 to 0.5% in India with a higher percentage being found in the southern parts of the country [7, 8]. A variety of physiological factors have been associated with it including betel nut chewing, capsaicin, autoimmunity and genetic predisposition [9, 10]. The OSMF, if not taken care of can lead to oral cancer. The conversion rate is about 2–10%. It is the major health issue affecting 2.5 million Indian population under the age of 40 years. Younger population has more rapid progression. All the available treatments give only symptomatic relief which is short lived [11, 12].

Lack of present therapies to either provide a complete cure or treating the patients at the cost of adverse effects and the alarmingly rising incidence of OSMF urge for a search for an effective and safe remedy of OSMF (Tables 1, 2, 3).

Therefore a combined effort by natural herbs and behavioural modification helps lowering the morbidity of OSMF.

Materials and methods

It was a prospective observational study.

Informed consent was taken from each patient for participation in the study. These patients were given Inj. Triamcinolone (40 mg) and Inj Hyaluronidase every 21 days

Pt was divided in 2 groups

1. Receiving Triamcinolone ointment alone BD (control)
2. Receiving Triamcinolone ointment BD along with turmeric & aloe vera paste combination (test).

One Fifty patients of recently diagnosed histologically proven cases were selected, which were to be followed up after giving them the above mentioned treatment. The study was completed with 140 patients as 10 patients did not turn up for follow-up. Patients were divided into 2 groups 70 each (all patients were selected by single blinding method). In test group there were 60 males and 10 females while in control group there were 58 males and 12 females.

1 gm of turmeric is mixed with aloe vera to form a thick paste which needs to be applied each time for three to four times per day after meals.

Table 1 Comparative statistics for IID for both the study groups

Interincisal distance				
Variables	Before treatment	After treatment	t value	p value
Mean mouth opening (mm) CONTROL	23.95 ± 1.599	26.09 ± 1.3455	1.1566	0.551
Mean mouth opening (mm) Test	23.99 ± 1.44	30.83 ± 2.011	3.46	0.000945

Table 2 Comparative statistics for visual analogue scale for spicy food for both the study groups

Visual analogue scale				
Variables	Before treatment	After treatment	t value	p value
Mean burning sensation (VAS) CONTROL	8.0 ± 0.506	7.187 ± 0.645	1.101	0.2743
Mean burning sensation (VAS) TEST	8.06 ± 0.45	5.66 ± 0.77	3.77	0.0003

Table 3 Comparative statistics for IID & VAS for both male and female in both study groups

Variables	Before treatment		After treatment		t value		p value	
	Male	Female	Male	Female	Male	Female	Male	Female
<i>Interincisal distance</i>								
IID (mm) CONTROL	23.96 ± 1.65	23.9 ± 1.34	26.13 ± 1.38	25.87 ± 1.17	11.38	2.55	2.09	0.034
IID (mm) TEST	23.95 ± 1.494	24.18 ± 1.23	30.77 ± 2.04	31.11 ± 1.9286	2.81	2.36	0.0067	0.03
<i>Visual analogue scale</i>								
VAS CONTROL	8.01 ± 0.51	7.99 ± 0.534	7.16 ± 0.65	7.31 ± 0.622	1.99	2.36	0.051	0.046
VAS TEST	8.06 ± 0.435	8.04 ± 0.55	5.64 ± 0.79	5.74 ± 0.72	3.046	2.48	0.003531	0.032

The physiotherapy was indicated for both the groups by mouth exercise device (MED). The patients were instructed to exercise for 20 min (10 min on each side) with the help of the MED three times a day for 3 months.

Patients were involved irrespective of age, gender, occupation, social status, ethnicity, and stages of OSMF.

A total of 140 clinically diagnosed patients with OSF (diagnosed on the basis of reduction in interincisal distance on maximum mouth opening and palpable fibrous bands involving oral mucosa) within the age range of 18–50 years and decreased interincisal were selected (time period 1.5 year). These patients were asked to discontinue all the habits of tobacco or areca usage at the time of treatment. Out of total 140 patients, twenty two were females and One hundred eighteen were males.

The baseline and recall evaluations were done on the basis of:

- *Objective criteria:* Measurement of interincisal distance (I.I.D.) on maximum mouth opening over two fixed reference points with the help of digital vernier caliper.
- *Subjective criteria:* Visual Analogue Scale (VAS) for burning sensation with spicy food (not plain food, since spicy food is a better prognostic marker)

VAS is a 10 cm line without calibrations drawn with extreme negative & positive end. The patient is asked to mark one point on the VAS describing his/her present status of burning sensation. On further follow ups the previous markings on VAS scale were not shown to the patient to prevent bias on follow ups. The criteria for spicy food includes food item with addition of chilies. All the above criteria's were evaluated for baseline (objective and subjective criteria before the start of study), every month till 3 months.

Result

The patients were examined for mouth opening (measured by interincisal distance) and burning sensation to spicy food (measured by visual analogue scale).

From the above analysis it is clear that the test subjects ($p = 0.000945$) is having greater benefit than the control group in inter incisal distance ($p = 0.551$).

From the above analysis it is clear that the test subjects ($p = 0.000945$) is having greater benefit than the control group in visual analogue scale ($p = 0.551$).

Thus this study makes it clear that patients who are taking additionally turmeric and aloe vera are benefitted more than those taking medicines alone in short as well as long term.

Discussion

In present study it can be concluded that patients receiving turmeric and aloe vera paste are benefitted more than the patients not taking it and this hold true in both male in female, however the significance is more in male as compared to females.

The results of the present study were compared with the results of documented outcomes of other therapeutic procedures. In the study conducted by Alam S et al., the efficacy of aloe vera gel as an adjuvant therapy of OSMF has been assessed on 60 patients. They were divided into two categories: medicinal treatment (submucosal injection of hyaluronidase and dexamethasone, $n = 30$) and surgical treatment ($n = 30$). Each category was randomly divided into Aloe vera and without aloe vera group (with 15 patients in each category) [11].

The results showed that the group receiving aloe vera had a significant improvement in most symptoms of OSMF ($P < 0.01$) compared with the non Aloe Vera groups in both the medicinal and surgical categories [12]. Karemore TV et al., evaluated the effect of newer anti oxidant lycopene in the treatment of oral submucosal fibrosis. The study group included 92 patients with OSMF. Out of the 92 patients, 46 patients were given lycopene and remaining 46 were on placebo. Lycopene group patients received 8 mg Lycopene per day in two divided doses of 4 mg each, while placebo group patients received placebo tablet twice a day. Lycopene was found to be significantly efficacious as the percentage of the cases with improved maximal mouth opening was 69.56% ($P < 0.05$). It was observed that an increase in the mean mouth opening was 4.46 ± 3.65 mm in the lycopene group while 1.16 ± 1.3 mm in the placebo group.

The aims of study are therefore, to evaluate the safety of the medicines and the efficacy in the form of pre and postoperative difference in the interincisal distance, difference in the VAS score for normal and spicy food.

Conclusion

Since historic times, Ancient traditional medicines have been seen with an eye of speculation for their therapeutic properties. For the past decade there has been increase in the awareness and knowledge regarding folk medicine globally for the reason that they encompass antimicrobial,

antioxidant, anti-fungal, anti-viral, anti-inflammatory and anti-carcinogenic properties. This appraisal is an attempt in bringing to light some of the herbs which hold a promising future in treating oral mucosal lesions. These herbs are not stand alone managements but can be used as a viable substitute. More clinical trials need to be conceded for standardization of these natural merchandises to identify their efficiencies.

We found that Turmeric and Aloe vera are a good supplement agents which not only help in reducing the burning sensation of the patient to spicy food but also useful in reducing the fibrosis thereby allowing greater mouth opening better than applying injection Triamcinolone and hyalase and Triamcinolone ointment alone in patients of Oral submucosal fibrosis.

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