

A Review of Various Allied Therapies for Treatment of Oral Submucous Fibrosis

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Abstract

Oral Submucous Fibrosis (OSMF) is a precancerous, chronic, scarring condition involving oral mucosa, the oropharynx, and rarely the larynx. It is progressive in nature and one of the most poorly understood and unsatisfactorily treated precancerous condition. The various conventional treatment modalities used for its treatment provide symptomatic relief. This article is the review of published literature on the allied medicine therapies in treating OSMF. The literature gives evidence in the use of physiotherapy, Ayurveda, homeopathy as allied treatment modalities for OSMF. The relevant literature proves that these allied modalities promise a natural and cost effective treatment option. Their use along with lifestyle modification will help in curing the disease. Though relevant randomized control trials need to be evaluated to enhance its awareness and use by patients as a primary non invasive therapeutic modality.

Keywords: *Allied Treatment; Ayurveda; Homeopathy; Oral Submucous Fibrosis; Physiotherapy*

Abbreviation

OSMF: Oral Submucous Fibrosis

Introduction

Oral submucous fibrosis (OSMF) was defined by Pindborg and Sirsat as “an insidious, chronic disease affecting any part of the oral cavity and sometimes the pharynx, although occasionally preceded by and/or associated with vesicle formation, it is always associated with juxtaepithelial inflammatory reaction followed by fibroelastic change of the lamina propria, with epithelial atrophy leading to stiffness of the oral mucosa and causing trismus and inability to eat” [1]. OSMF is progressive in nature and one of the most poorly understood and unsatisfactorily treated disease. The persistent chewing of areca nut plays a primary role in the etiology of OSMF. The other predisposing factors include poor nutritional states, chilly consumption, hereditary susceptibility, autoimmunity and collagen disorders [2]. This precancerous condition is most prevalent in India with a reported frequency ranging up to 0.4% in the rural population, followed by Bangladesh, Sri Lanka, Pakistan, Taiwan, and China. In India OSMF is observed in Bihar, Maharashtra, Gujarat and Madhya Pradesh [3]. The various treatment modalities used to cure the disease are corticosteroids, hyaluronidase, placenta extract, IFN, microwave diathermy and surgical treatment options which include excision of fibrotic tissues and covering the defect with graft [4]. Along with these treatment mo-

dalities scientific literature shows that other allied treatment therapies involving Ayurvedic preparation, Homeopathy and Physiotherapy can provide a safer, low cost, and effective allied modality to the present conventional treatment, which can be useful in a country like India. This article discusses the etiopathogenesis of this dreaded condition in brief, with a review of the clinical trials previously performed at various allied medical fronts as promising therapeutic modalities for OSMF.

Discussion

Etiopathogenesis: The pathogenesis of OSMF is believed to be multifactorial. OSMF is considered to be a collagen metabolic disorder. As the most important risk factor is recorded to be chewing of betel quid, following is the flowchart of the pathogenesis of OSMF on intake of areca nut [5] (Figure 1 and 2a, 2b).

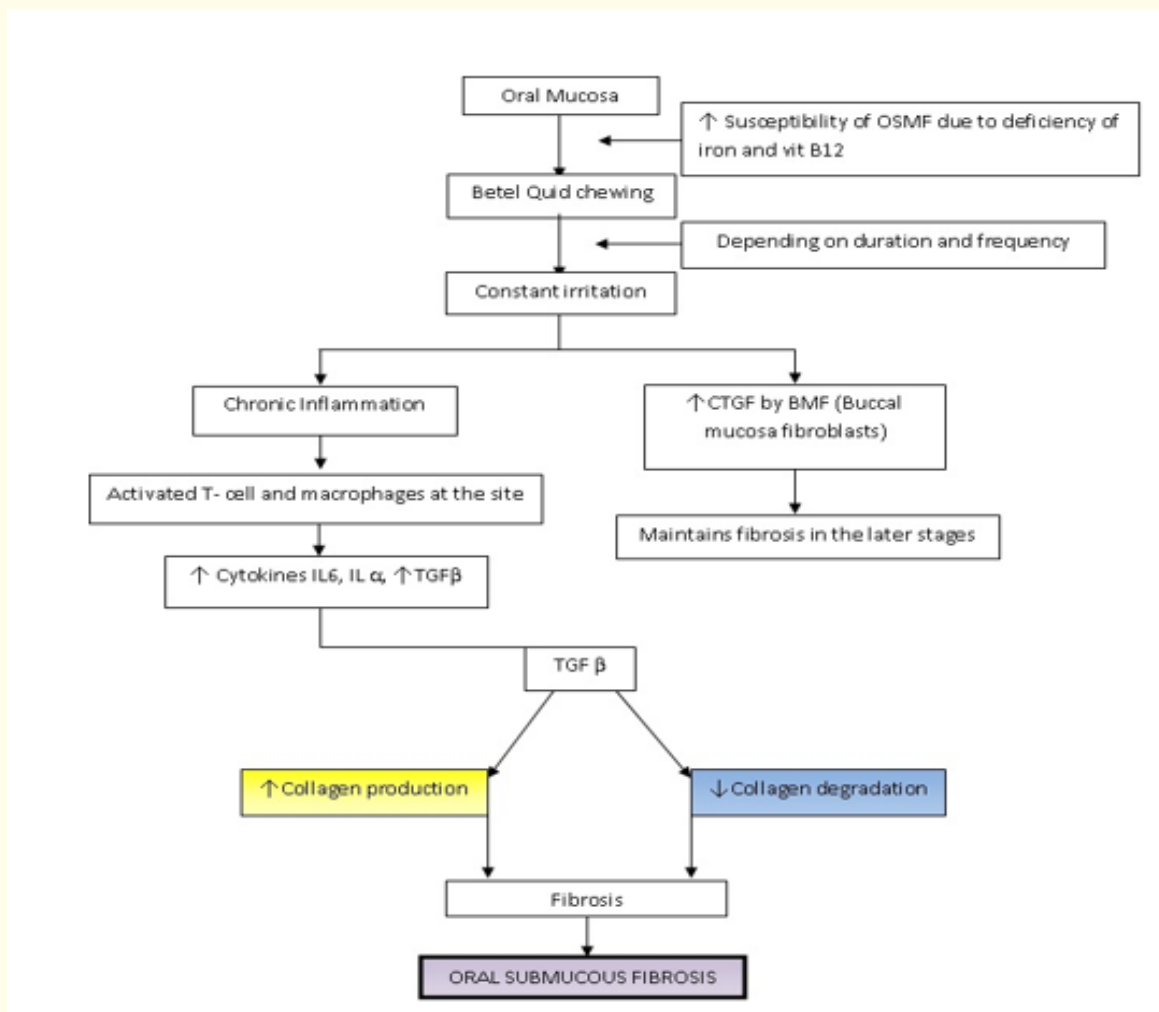


Figure 1: Pathogenesis of OSMF on consumption of arecanut.

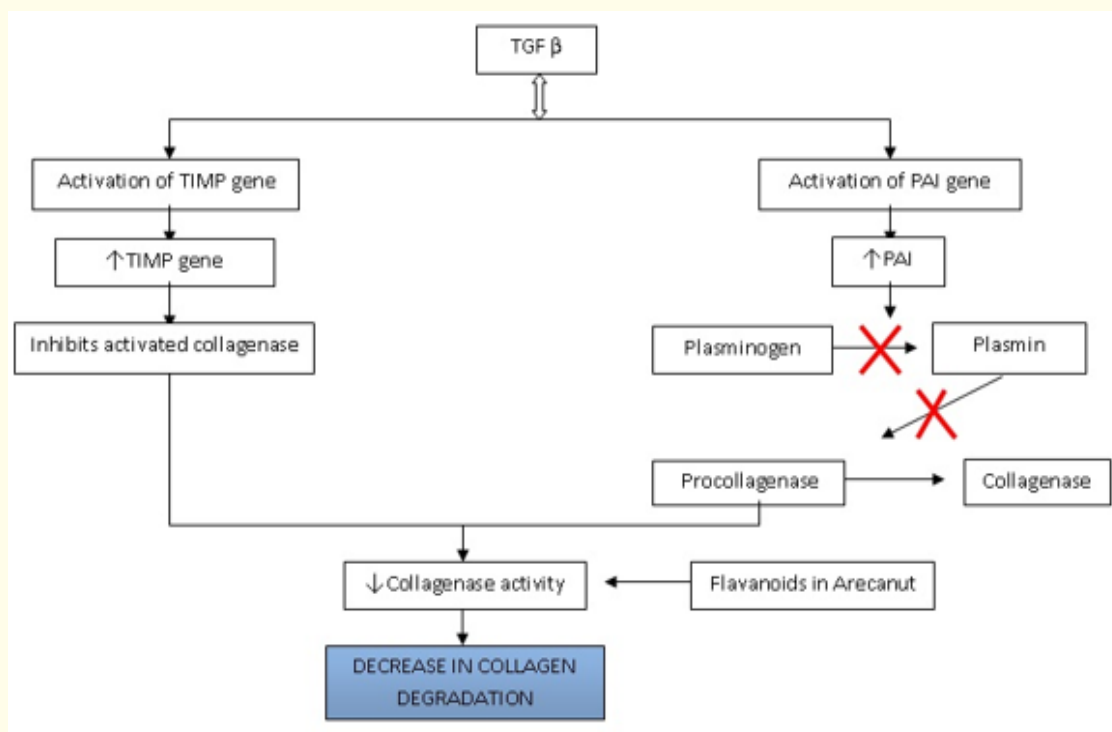


Figure 2a: Flowchart explaining the decrease in collagen degradation which increases the risk of OSMF.

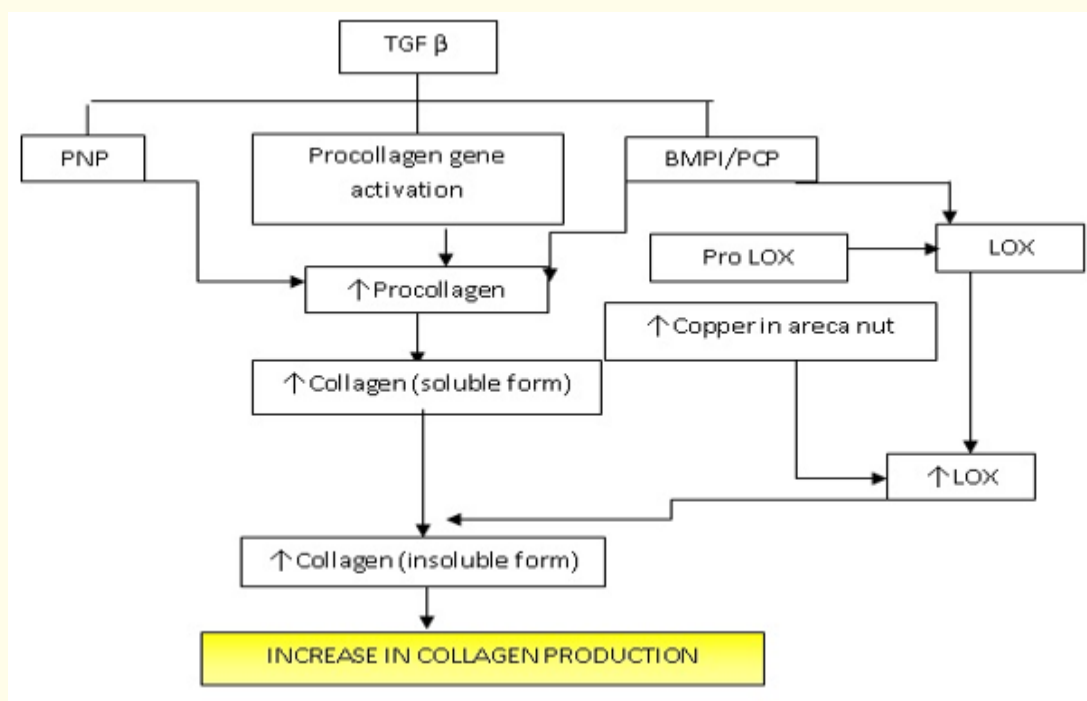


Figure 2b: Flowchart explaining the increase in collagen production which increases the risk of OSMF.

In order to achieve a long term relief, the treatment modalities should aim at crubing the flow of reactions occurring during the patho- genesis of the condition rather than just releiving the symptoms. Currently many allied medicine therapies aim at targetting this cascade of events. The available treatment modalities relieve only the symptoms and its effect is short lived. Hence to obtain more natural, effective and economic treatment option, research trials are being carried out to explore the allied treatment therapies which treat OSMF or act as an effective adjuvant to bring about symptomatic relief.

Allied medicine for treating oral submucous fibrosis

Allied medicine has a holistic approach for treating OSMF. Following listed are few of the allied medicine therapies used for treating OSMF which have been found in the scientific literature.

Ayurveda

Turmeric

Turmeric (*Curcuma longa Linn*) is made into a yellow powder with a bitter yet sweet taste [6]. It is known to have many therapeutic actions including anti- inflammatory [7], antioxidant [8], causes increased blood supply [9] and is believed to have anti-mutagenic action [10]. Turmeric constituents include three curcuminoids: Curcumin, demethoxycurcumin and bisdemethoxycurcumin. Curcumin (diferu- loylmethane), is an anti-inflammatory agent and suppresses cellular transformation, proliferation and metastasis by suppressing tumor necrosis factor (TNF)-induced NF-κB activation and NF-κB-dependent reporter gene expression [11]. Its site of action in treating OSMF can be illustrated in the following figure 3.

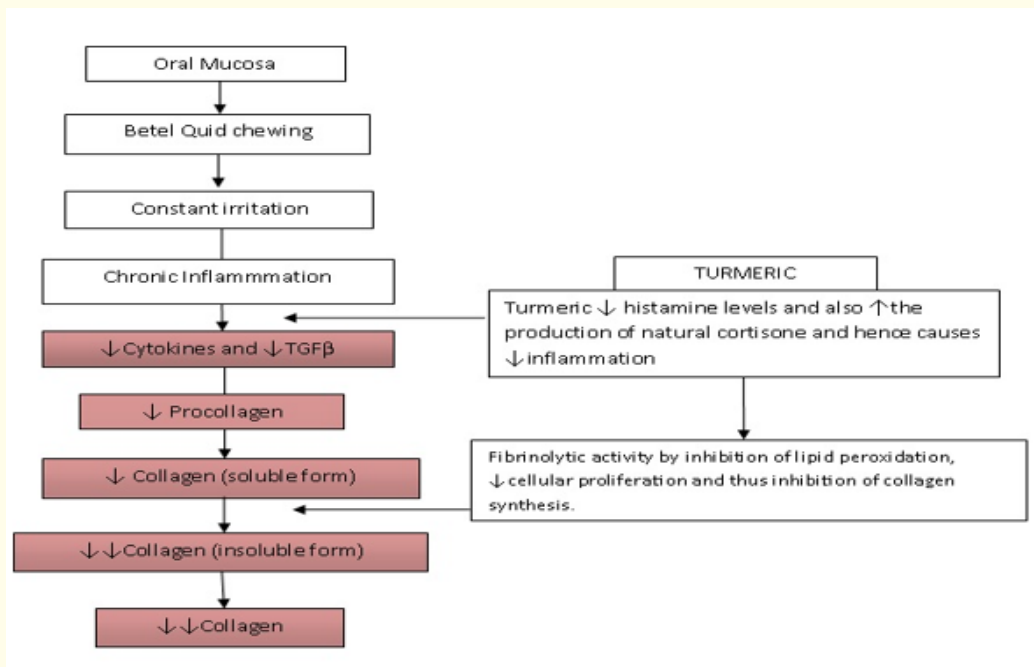


Figure 3: Flowchart explains the action of Turmeric in decreasing histamine levels to decrease inflammation and decrease in collagen production.

A study conducted by Hastak, *et al.* concluded that turmeric oil and turmeric oleoresin both act synergistically *in vitro* to offer protection against DNA damage. Thus, curcumin holds a promising future in the treatment of OSMF [12].

Tulsi

Ayurveda recommends Tulsi (*Ocimum sanctum Linn*) in several formulations to enhance immunity and metabolic functions. It helps in reducing inflammation by inhibiting the inflammation-causing enzymes [13]. Literature review of a study conducted by Adit Srivastava, *et al.* on the clinical evaluation of the synergetic effect of turmeric and tulsi for the management of OSMF showed that synergistic action of these two herbs results in higher efficacy and highly potent anti-OSMF treatment. It caused an early, sustained and significant fall in burning sensation, clinically and statistically in the first month of trial. Mouth opening was also significantly improved. Results were better in severe cases reflecting its higher efficacy [14].

Aloe vera

Aloe vera is an emollient resin and a mannoprotein containing many amino acids, called 'wound healing hormones' [15]. The polysaccharides contained in the gel of the leaves has anti-inflammatory, immunomodulatory, antioxidant and wound-healing properties, it also has antiseptic, antiviral, hypoglycaemic, antibacterial and antifungal properties. It is known to strengthen the immune system [16,17]. It improves wound healing by increasing blood supply, which in turn increases oxygenation. *Aloe vera* has soothing and cooling properties. This property of *Aloe vera* reduces pain and burning sensation in OSMF patients [18].

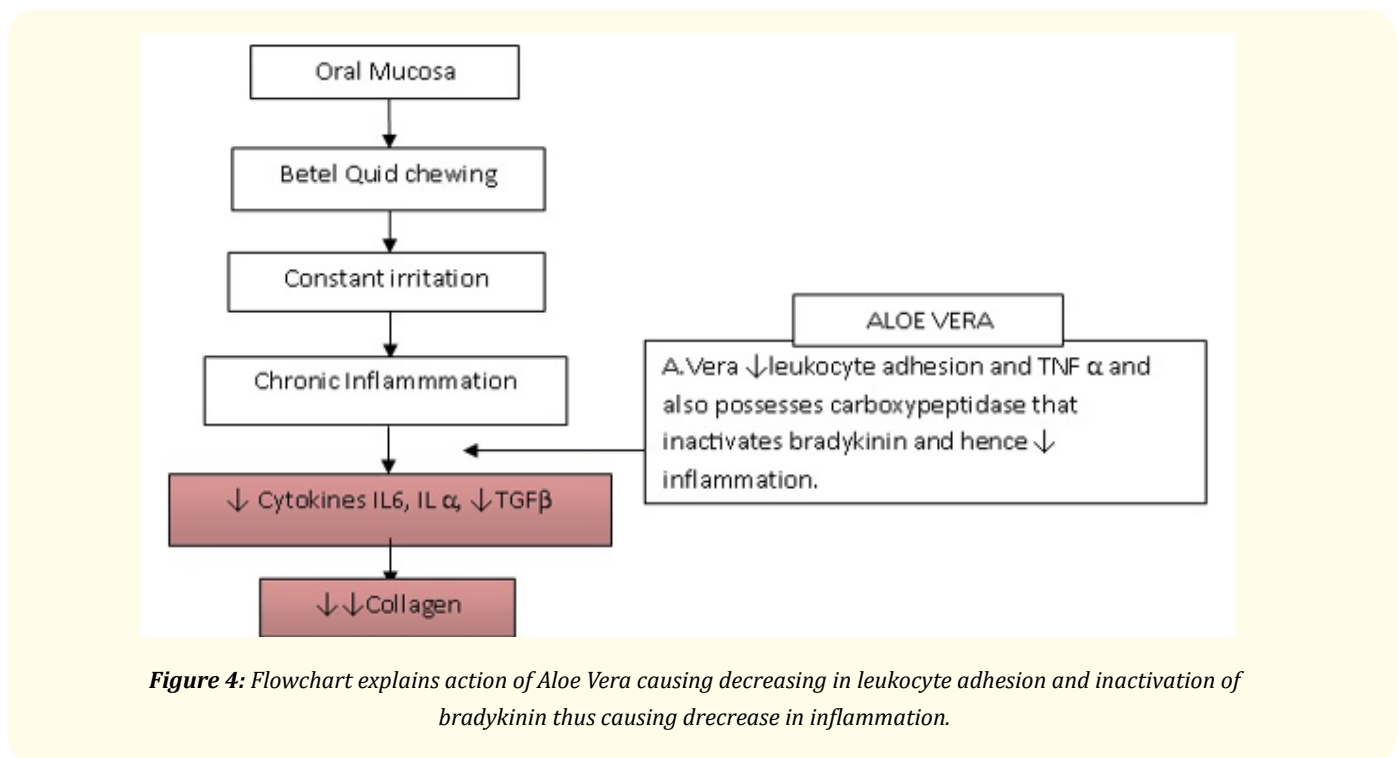


Figure 4: Flowchart explains action of Aloe Vera causing decreasing in leukocyte adhesion and inactivation of bradykinin thus causing decrease in inflammation.

In the study, conducted by Alam S., *et al.* the efficacy of *Aloe-vera* gel as an adjuvant therapy of OSMF showed that the groups receiving *Aloe vera* had a significant improvement in most symptoms of OSMF [15]. A study conducted by Ardra Anuradha., *et al.* involved administration of pure aloe vera gel and pure aloe vera juice to Group A and Group B respectively. The study resulted that both group subjects showed a statistically significant reduction in burning sensation. The reduction in burning sensation was rapid in Group A, whereas the reduction obtained in Group B subjects was more gradual [19]. Another study conducted by Sudarshan., *et al.* observed that *Aloe vera* significantly reduced burning sensation and improved mouth opening and cheek flexibility when compared to other antioxidants [20]. *Aloe vera* should be monitored cautiously as its use during pregnancy may cause uterine contractions in mothers and gastrointestinal distress in nursing infants. Oral administration of *Aloe vera* can cause abdominal cramps and low potassium levels [21,22].

Oxitard

Oxitard is a natural antioxidant. Its use as an allied medicine for OSMF has been evaluated in various research clinical trials. A study conducted by Patil S., *et al.* involving the use of oxitard capsules in patients having OSMF reported significant improvement in the mouth opening, tongue protrusion, burning sensation, pain associated with the lesion, difficulty in swallowing and speech [23].

Spirulina

Spirulina is a source of proteins, carotenoids and other micronutrients and has antioxidant property with high amount of beta carotene and superoxide dismutase so it can be effectively used in treatment of OSMF [24].

Physiotherapy

The early signs of OSMF involve blanching of the oral mucosa followed by development of fibrous bands in the areas such as buccal mucosa, palate, posterior larynx, lips and tongue. This leads to difficulty in mouth opening most prominent feature of OSMF. In order to regain the tissue elasticity, studies have been conducted to use physiotherapy as an allied treatment option.

Kneading is a massage therapy used to improve the elasticity of fibrous tissues and used in mobilizing scar tissues. Soft tissue manipulation is extensively used in physiotherapy for improving tissue extensibility [25].

Muscle stretching exercises for the mouth may be helpful to prevent further restriction of mouth movements and to prevent relapse. Mouth gag, acrylic surgical stent, ballooning of mouth, hot water gargling, inter positioning spatula between the teeth and adding a new spatula every 5 - 10 days can be used for performing these stretching exercises [26].

Application of heat in the form of lukewarm water, hot rinses or selective deep heating therapies like short wave or micro wave diathermy is another intervention used in physiotherapy to reduce trismus caused by OSMF [4].

Ultrasound equipment (electroson) and Cryotherapy: In a study conducted by Vijayakumar M., *et al.* to improve mouth opening and tongue protrusion in patients suffering from OSMF various exercises were performed. During the study all the patients were treated with the same ultrasound equipment (electroson) followed by finger and thumb kneading at the buccal region inside the mouth with mild stretching over the fibrous bands with in tolerable pain limits. They were provided with cryotherapy before and after the treatment for 5 - 7 minutes to perceive less pain sensation. Gentle stretch over the buccal cavity was performed with the fingers. Temporomandibular joint mobilization by Antero-inferior glides to improve jaw depression; lateral glides for improving mandibular deviation with joint distraction were done. The study resulted with a mean improvement in mouth opening and significant improvement in tongue protrusion [27].

Thus physiotherapy interventions used in the initial stages of OSMF definitely show a significant improvement in the patients' condition with no side effects and could be used as a treatment protocol for patients with OSMF before a more invasive surgical intervention is sought.

Homeopathy

Recent scientific literature reports that people are opting homeopathy over allopathy for relieving medical conditions. Homeopathy enhances the holistic state of health as whole rather than just treating the disease. Though homeopathy cannot replace the mechanical art of dentistry but acts as an adjunct to conventional dentistry [28]. The literature supports use of homeopathy in dentistry to treat various dental problems of them being trismus. Calcarea phosphorica, a homeopathy medicament is used when mouth cannot be opened without pain. Cuprum metallicum is used for trismus of muscles. These can be used to reduce the trismus experienced during OSMF. With advantages of minimal side effects and favorable treatment outcome, homeopathy has emerged as one of the allied therapy in cases of treatment failure or poor response to conventional drugs. The knowledge and understanding of Homeopathic approach of treatment for treating OSMF is still an ongoing process and further research should be carried out in this regard [29].

Conclusion

All the allied treatment modalities discussed here promise a natural and cost effective treatment option. Due to their natural origin, their healing properties can be well exploited. As OSMF is a precancerous condition with multifactorial etiology, no single conventional treatment has proved to be definitive. Though literature supports the fruitful result of these allied therapies in the management of oral submucous fibrosis, there is lack of evidence regarding their use as a definitive treatment modality. Hence, relevant randomized controls trials need to be evaluated to enhance its awareness and use by patients as a primary non invasive therapeutic modality.

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