



## ASSESSING THE EFFICACY OF OXITARD CAPSULES IN THE MANAGEMENT OF ORAL SUBMUCOUS FIBROSIS

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### ABSTRACT

Oral Submucous Fibrosis is a chronic debilitating disorder affecting the oral cavity, pharynx and the upper digestive tract. The present research assesses the role of Oxitard capsules in the management of Oral Submucous Fibrosis considering various parameters like improvement in mouth opening, tongue protrusion, cheek flexibility and reduction in burning sensation in the oral cavity on 30 patients who attended the Outpatient Department of Dr. D. Y Patil Dental College and Hospital, Pimpri, Pune. The study concluded that the administration of Oxitard capsules showed improvement in mouth opening, tongue protrusion, cheek flexibility and decrease in the burning sensation in the oral cavity.

**Key words:** Oral Submucous Fibrosis, Oxitard Capsules, Antioxidants.

### INTRODUCTION

Oral Submucous Fibrosis (OSMF) is defined as an insidious, chronic disease which affects any part of the oral cavity and sometimes the pharynx [1] and is occasionally preceded by and/or associated with vesicle formation [2] and is always associated with a juxta-epithelial inflammatory reaction which is followed by progressive hyalinization of the lamina propria [3] leading to stiffness of the oral mucosa and deeper tissues with progressive limitation in opening of the mouth and protrusion of the tongue leading to difficulty in eating, swallowing and phonation [4].

It is a precancerous condition seen most commonly in the Indian sub-continent and has a reported incidence of between 0.2–1.2% of the urban population who attend the dental clinic [5]. The condition shows a female: male predilection of 3:1 and characteristically first presents in adulthood between the ages of 45–54 years.

The etiology is multifactorial origin for this condition and the various hypothesis implicated include the

role of local irritants such as capsaicin [6], tobacco [7], areca nut [8-12], pungent and spicy foods [13], and alcohol [14], iron and vitamin B-complex deficiency, anaemia [15], and a genetic predisposition to the disease.

There are different treatment modalities for this condition, here one such treatment modality in the form of administration of antioxidants in the form of Oxitard capsules was carried out on 30 patients who attended the Outpatient Department of Dr. D.Y Patil Dental College and Hospital, Pimpri, Pune -18.

### Aim of the study

To assess the efficacy of Oxitard capsules in the management of patients with Oral Submucous Fibrosis.

### MATERIALS AND METHODS

#### Source of data

Thirty (30) adult patients who enrolled with signs and symptoms of OSMF were included in the study.

Following parameters were included in the establishment of diagnosis and these two parameters were satisfied for inclusion in the study. A. Positive history of chewing of areca nut or one of its commercial preparations, difficulty in chewing and swallowing, and having burning sensation on eating spicy food. B. Restricted mouth opening and changes in oral mucosa including presence of palpable vertical fibrous bands, stiffness and blanching.

Following establishment of diagnosis, each patient was informed about the condition, its precancerous potential and advised to discontinue use of areca nut in all forms. A detailed case history including habit of history with details of duration, in years, frequency of chews per day was taken. All patients underwent oral prophylaxis to remove extrinsic stains, in order to motivate the patient towards recovery and to inform the investigator if patient resumes habit. Each patient was screened for diagnosis and inclusion, examined on three occasions, day 1 which is the first day of starting treatment, day 30, day 60, day 90 which is the fourth and last day of evaluation. Each patient was administered Oxitard capsules, 2 capsules twice a day for 60 days.

**METHOD OF DATA COLLECTION**

**Patients were evaluated for the following criteria**

**1. Mouth opening based on interincisal separation**

Distance between the upper and lower central incisors when maximally extended with mouth wide open. Normal values: Males-35-45 mm. Females-30-42 mm (Figure 1).

**2. Tongue protrusion**

Measured on the distance from the mesial incisal edge of central incisor to the tip of the protruded tongue. (Figure 2). Normal values: Males-5-6 cms. Females-4.5-5.5 cms.

**3. Cheek flexibility (CF)**

Based on the distance between specified points on the cheek skin, V1 and V2, in normal position and with cheeks blown out  $CF = V1 - V2$  where V2= is marked at one third the distance from the angle of the mouth on a line

joining the tragus of the ear and the angle of the mouth. (Figure 3) V1=the subject is then asked to blow his cheeks fully and the distance measured between the two points is marked on the cheek. Mean value for Males-1.2 cms, Females-1.08 cms

**Inclusion Criteria**

Patients suffering from chronic oral mucous fibrosis lesions characterised by burning sensations in the mouth, particularly while taking hot and spicy foods. Adult patients of either sex aged between 18-50 years were included. Patients who had not participated in a similar investigation in past four weeks. Patient willing to give a written informed consent and follow the schedule.

**Exclusion criteria**

Patients suffering from severe systemic disorders pertaining to cardiac, respiratory, central nervous system, renal or hepatic disorders. Patient who have participated in a similar clinical investigation in the past four weeks. Patient who has used a similar product in the past four weeks. Patients who refused to sign informed consent. Patients having a known history or present condition of allergic response to similar pharmaceutical products, pre-existing systemic disease necessitating long-term medications and pregnant and lactating women were excluded from the study.

**Method of data analysis**

Results were analysed statistically by means of a paired t-test analysis.

Thus it is seen that there is increase by 8.05% in mouth opening, 7.18% increase in tongue protrusion, 7.07% increase in cheek flexibility and 31.54% decrease in burning sensation from starting treatment (day 0) to last day of evaluation (day 90). Thus it is concluded that mouth opening showed highest increase, followed by tongue protrusion, and cheek flexibility from starting treatment (day 0) to last day of evaluation (day 90). Burning sensation showed a significant decrease from starting treatment (day 0) to last day of evaluation (day 90).

**RESULTS**

**Table 1. Distribution of Mean and SD values of mouth opening (mm) at Day 0, Day 30, Day 60 and Day 90**

Duration	Mouth Opening (mm) (n=30)	Student's Paired 't' test value	'p' value	Significance
	Mean ± SD			
Day 0	28.19±7.80	50.11	p<0.01	Highly significant
Day 30	29.23±7.86			
Day 60	30.04±8.02			
Day 90	30.66±8.07			

By applying Student's Paired 't' test there is a highly significant increase in mean mouth opening (mm) from starting treatment i.e. day 0 to last day of evaluation i.e. day 90 (p<0.01). The average increase is 2.46 mm±1.08 mm.

**Table 2. Distribution of Mean and SD values of Tongue Protrusion (mm) at Day 0, Day 30, Day 60 and Day 90**

Duration	Tongue Protrusion (mm) (n=30)	Student's Paired 't' test value	'p' value	Significance
	Mean ± SD			
Day 0	38.31±9.06	569.72	p<0.01	Highly significant
Day 30	38.62±11.10			
Day 60	40.65±9.04			
Day 90	41.43±9.09			

By applying Student's Paired 't' test there is a highly significant increase in mean Tongue Protrusion (mm) from starting treatment i.e. day 0 to last day of evaluation i.e. day 90 (p<0.01). The average increase is 3.11 mm±0.921 mm.

**Table 3. Distribution of Mean and SD values of Cheek Flexibility (mm) at Day 0, Day 30, Day 60 and Day 90**

Duration	Cheek Flexibility (mm) (n=30)	Student's Paired 't' test value	'p' value	Significance
	Mean ± SD			
Day 0	42.44±3.75	93.13	p<0.01	Highly significant
Day 30	43.69±3.58			
Day 60	44.72±3.79			
Day 90	45.67±3.94			

By applying Student's Paired 't' test there is a highly significant increase in mean Cheek Flexibility (mm) from starting treatment i.e. day 0 to last day of evaluation i.e. day 90 (p<0.01). The average increase is 2.97 mm±0.96 mm.

**Table 4. Distribution of Mean and SD values of Burning Sensation (vas) at Day 0, Day 30, Day 60 and Day 90**

Duration	Burning Sensation (VAS) (n=30)	Student's Paired 't' test value	'p' value	Significance
	Mean ± SD			
Day 0	2.97±0.96	73.26	p<0.01	Highly significant
Day 30	2.77±0.93			
Day 60	2.27±0.90			
Day 90	2.03±0.88			

By applying Student's Paired 't' test there is a highly significant decrease in mean Burning Sensation (VAS) from starting treatment i.e. day 0 to last day of evaluation i.e. day 90 (p<0.01). The average decrease is 0.94 mm±0.02 mm.

**Table 5. Percentage Increase\* / Decrease\*\* from starting treatment (day 0) to last day of evaluation (day 90) of all parameters.**

Mouth Opening (mm) (n=30)	Tongue Protrusion (mm) (n=30)	Cheek Flexibility (mm) (n=30)	Burning Sensation (VAS) (n=30)
% increase*/decrease**from starting treatment (Day 0) to last day of evaluation (Day 90)			
8.05%* ↑	7.18%* ↑	7.07%* ↑	31.54%** ↓

**Figure 1. Mouth opening measurement**

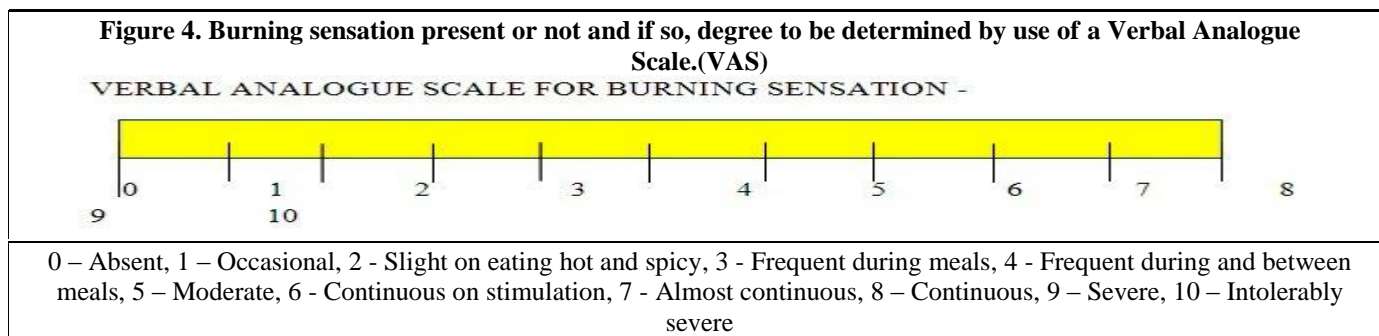


**Figure 2. Tongue protrusion**



**Figure 3. Marking for CF**





**DISCUSSION**

Oral submucous fibrosis is a precancerous condition affecting the buccal mucosa of the oral cavity most commonly leading to marked rigidity and inability to eat [16,17] however any part of the oral cavity may be involved including the pharynx [18] eventually leading to decrease in mouth opening.

Consumption of chillies, nutritional deficiency, chewing of areca nut, genetic susceptibility, altered salivary constituents, autoimmunity and collagen disorders have been postulated in the pathogenesis of this condition [19]. Malignant transformation rate of OSMF is as high as 7.6% in a study conducted in the Indian subcontinent over a 17 year period [20]. Diagnosis of OSMF cases is usually based on evaluating the clinical signs and symptoms, ie oral ulceration, burning sensation (particularly with spicy foods), paleness of the oral mucosa, and occasionally leukoplakia. Vertical fibrous bands within the cheeks along with stiffness of the buccal mucosa are most commonly seen with this condition which leads to trismus and inability to eat, however, successful intervention in the

early stages shows significant improvement in symptoms [21].

Treatment options include initially stoppage of habit followed by avoidance of spicy food and ingestion of chillies followed by intralesional steroid injections, placental extracts, pentoxifylline, lycopene, surgical excision and laser therapy can be used to a greater effect in reducing the signs and symptoms of OSMF. The antioxidant property of a particular food/drug is based on the ability of that particular drug to neutralize free radicals by means of a process known as oxygen radical absorbance capacity (ORAC). The ORAC score is directly proportional to the ability of the substance neutralizing free radicals. Oxitard, a phytopharmaceutical formulation from The Himalaya Drug Company, possesses ORAC value which is equivalent to vitamin C. Oxitard Capsules neutralizes the free radicals effectively and maintains the right REDOX balance by reducing the oxidative stress hence can be implicated as a treatment modality in coronary artery disease, diabetes mellitus, dermatosis, oral submucous fibrosis, and postoperative recovery [22].

**Table 6. Formulation of Oxitard Capsules which has been obtained from the pamphlet which is part of the drug package**

Formulation	Each Oxitard capsule contains	Quantity of drug (mg)
Extracts	<i>Mangifera indica</i>	94 mg
	<i>Withania somnifera</i>	71 mg
	<i>Daucus carota</i>	47 mg
	<i>Glycyrrhiza glabra</i>	29 mg
	<i>Vitis vinifera</i>	12 mg
Powders	<i>Emblica officinalis</i>	141 mg
	<i>Syzygium aromaticum</i>	29 mg
	<i>Yashada bhasma</i>	2.5 mg
Oil	<i>Triticum sativum</i>	6.5 mg

Phytochemical studies of different parts of *Mangifera Indica* also known as mango, aam have shown the presence of phenol constituents, triterpenes, flavonoids, phytosterols, and polyphenols show potent anti-oxidant properties [23].

*Withania Somnifera* (Ashwagandha) known as Indian ginseng act as radical scavenger due to their hydroxyl groups. Also the flavonoids present with a scavenging or chelating process demonstrating its antioxidant properties [24] along with the other properties

like [25] anxiolytic, adaptogen, memory enhancing, antiparkinsonism, antivenom, antiinflammatory, antitumor properties.

Phenolic compounds present in *Daucus Carota* commonly known as carrot act as powerful chain breaking antioxidants and their radical scavenging properties is due to the presence of the hydroxyl groups and their ability to scavenge radicals like hydroxyl, superoxide and peroxy [26].

Roots of *Glycyrrhiza Glabra* Linn (Yashtimadhu), also known as licorice and sweetwood, show demulcent, antacid, anti-ulcer, anti-inflammatory, expectorant, tonic, diuretic, laxative and sedative properties along with antipyretic, antimicrobial, antiherpes and anxiolytic properties [27].

*Vitis Vinifera* also known as (Common Grape Vine) contains various phenolic compounds such as caffeic, chlorogenic, o-coumaric, p-coumaric, ferulic, ciringic, vanillic, quercetin, and rutin acids which show significant antioxidant properties [28].

*Emblica Officinalis* (amla) contains ellagic acid, quercetin, kaempferol, emblicanin, flavonoids, glycosides, proantocyanidins act as powerful antioxidants [29].

*Buds of Syzygium Aromaticum* ie clove buds and the isolated flavonoids present in it show effective activity as hydrogen donors and act as primary antioxidants by reacting with lipid radicals [30].

Yashada (zinc) is known to enhance endogenous antioxidant defense mechanism against free radicals [31].

Phenolic compounds of Wheat (*Triticum aestivum* L./Sativum) is mainly responsible for the antioxidant activity by reversing the effect of ROS

mechanism [32]. Also during germination, the various vitamins, minerals, and phenolic compounds including flavonoids get synthesized in wheat sprouts, and these wheat sprouts reach the maximum antioxidant potential [33].

## SUMMARY AND CONCLUSION

In this study the efficacy of Oxitard capsules was evaluated in 30 OSMF patients. Oxitard capsules due to its special antioxidant properties were found to be effective in the improvement of signs and symptoms of Oral Submucous Fibrosis.

Oxitard capsules were effective in reducing the objective signs of OSMF thereby improving the mouth opening (percentage of which was 8.05%), improving the tongue protrusion (percentage of which was 7.18%), improving the cheek flexibility (percentage of which was 7.07%) and decreasing the burning sensation (percentage of which was 31.54%). Thus, it can be concluded that Oxitard capsules appears to be a very promising drug in the improvement of the symptoms and management of Oral Submucous Fibrosis.

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