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## Original Research Article

# Comparative study of rebamipide & betamethasone in managing stomatopyrosis in oral submucous fibrosis (OSMF) patients

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### ABSTRACT

**Background:** Oral sub mucous fibrosis (OSF) is commonly seen in the Indian subcontinent affecting individuals of all age groups. It is a potentially malignant disorder caused almost exclusively by the use of smokeless form of tobacco products. The malignant transformation rates vary from 3 to 19%. The standard of care (SOC) in managing OSF includes habit cessation, intralesional steroid and hyaluronidase injections, and mouth opening exercises.

**Objectives:** To evaluate the efficacy of rebamipide to reduce the oral burning sensation associated with OSMF as compared to conventional Betamethasone intralesional injection.

**Materials and Methods:** After providing information about the study and obtaining consent, these individuals were divided into two groups of 15 each using random sampling method. Patients in the rebamipide group (group I) were prescribed 100 mg tablets of rebamipide thrice a day for 21 days. The other 15 patients (group II) were given SOC, intralesional betamethasone injection 4 mg/mL once a week for 4 weeks. Visual analog scale (VAS) with 11 points (0–10) was used to assess burning sensation in the first visit, and change in the burning sensation was assessed after every 7th day on VAS in both the groups.

**Results:** The improvement in the VAS score in each visit was significant ( $p < 0.05$ ) in the 1st, 2nd, 3rd, and 4th visit. The VAS score between the 4th and 5th visit failed to reach a statistically significant level ( $p > 0.05$ ). The VAS score was significantly different between the rebamipide and betamethasone group ( $p > 0.05$ ) in third & fourth visit.

**Conclusion:** Our results showed that rebamipide was equally efficacious if not better than the betamethasone intralesional injections.

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## 1. Introduction

The incidence of Oral sub mucous fibrosis (OSF) is commonly seen in the Indian subcontinent. It affect individuals of all age groups It is a potentially malignant disorder caused almost exclusively by the use of smokeless form of tobacco products. The malignant transformation rates vary from 3 to 19%.<sup>1–3</sup> Oral sub mucous fibrosis

causes progressive debilitating symptoms affecting the oral cavity, such as burning sensation, loss of cheek elasticity, restricted tongue movements, and limited mouth opening. Chronic inflammation, oxidative stress, and cytokine production caused by the injuries due to the continuous local irritation by paan masala, gutkha, or areca nut. Oxidative stress and subsequent reactive oxygen species (ROS) generation can induce cell proliferation, cell senescence, or apoptosis, depending upon the amount of ROS produced. Such events can lead to preneoplastic lesions in the oral

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cavity that can subsequently transform into malignancy.<sup>4</sup> Oral sub mucous fibrosis is an irreversible condition and the management strategies are aimed at alleviating the symptoms. The standard of care (SOC) in managing OSF includes habit cessation, intralesional steroid and hyaluronidase injections, and mouth opening exercises. It affects the oral cavity and in severe forms can involve the pharynx. The characteristic symptoms of burning sensation and stiffness of the oral mucosa. It is estimated that 33% of men and 18% of women use smokeless form of tobacco in India.<sup>5</sup> Carcinogenesis occurs by generation of ROS, which act by initiating lipid peroxidase. In OSF, lipid peroxidase was found to increase according to the severity of the disease.<sup>6</sup> Rebamipide anti-inflammatory action is due to the reduction of inflammatory interleukin (IL)-6 and IL-8, reduction of neutrophil migration, and scavenging of free radicals.<sup>7</sup>

## 2. Aim and Objective

To evaluate the efficacy of rebamipide [2-(4-chlorobenzoyl) amino]-3-(2-oxo-1Hquinolin-4-yl) propanoic acid], essentially a mucosal protective agent, to reduce the oral burning sensation associated with OSMF as compared to conventional Betamethasone intralesional injection.

## 3. Materials and Methods

After obtaining the institution ethical committee approval, this prospective clinical study was undertaken among OSMF patients reporting to the OPD of department of oral Medicine & Radiology.

### 3.1. Inclusion & Exclusion Criteria

The inclusion criteria included all clinically diagnosed immune-competent OSMF patients complaining of burning sensation in the mouth.

Patients who were already taken treatment for OSMF, pregnant or nursing mothers, and those with known systemic illnesses or history of drug allergies were excluded from the study.

### 3.2. Methodology

After providing information about the study and obtaining consent, these individuals were divided into two groups of 15 each using random sampling method. Patients in the rebamipide group (group I) were prescribed 100 mg tablets of rebamipide thrice a day for 21 days. The other 15 patients (group II) were given SOC, intralesional betamethasone injection 4 mg/mL once a week for 4 weeks. Visual analog scale (VAS) with 11 points (0–10) was used to assess burning sensation in the first visit, and change in the burning sensation was assessed after every 7th day on VAS in both the groups. Patients were followed up for 4 weeks and were

advised to report adverse events if any. During the follow-up visit, number of tablets remaining was evaluated to ensure compliance to therapy.

## 4. Results

Mean & standard deviation of the evaluation of burning sensation by VAS score was calculated and comparison between the rebamipide and betamethasone group was done by using paired t-test. (Graph pad method). The age range of the study population was 19 to 65 years, with a mean age of the study population being  $32.2 \pm 10.09$  years. The rebamipide group had 13 males and 2 females, and the SOC (betamethasone) group had 14 males and 1 female. The VAS scores were evaluated for both the groups on 1st, 7th, 14th, 21st, and 30th day.

Table 1 summarizes the mean VAS scores of burning sensation in both the groups during their weekly follow-up visit. Patients who were in rebamipide group the burning sensation reduced from 4.7 to 0.8 on day 30. The burning sensation Patients in betamethasone group, reduced from 5.3 to 1.6 on day 30.

The improvement in the VAS score in each visit was significant ( $p < 0.05$ ) in the 1st, 2nd, 3rd, and 4th visit. The VAS score between the 4th and 5th visit failed to reach a statistically significant level ( $p > 0.05$ ). The VAS score was significantly different between the rebamipide and betamethasone group ( $p > 0.05$ ) in third & fourth visit (Table 2)

## 5. Discussion

Various treatment modalities had been tried with varying results like vitamin A supplementation, lycopene, pentoxifylline, hyaluronidase, corticosteroids, and placental extracts, all targeted at reducing inflammation for symptomatic relief to the patient.<sup>8–12</sup> The Complete cure of the disease has not been possible till date. Intralesional injections of steroids though very popular are purely palliative and have no curative value. It is also believed that repeated injection of the drug may further lead to fibrosis and associated trismus. Patient compliance is also poor due to the repeated painful intraoral injections.

Rebamipide work by reduces or blocking the ability of human mast cells to release an inflammatory mediator cyclic adenosine monophosphate phosphodiesterase, it also blocks proinflammatory substances and the production of substances that cause inflammatory reactions.<sup>13</sup> Rebamipide has been used as a gastroprotective drug and has demonstrated its ulcer healing properties in animal as well as human studies. It stimulates prostaglandin synthesis in the mucosa and improves the speed and the quality of ulcer healing<sup>14,15</sup> Rebamipide has been used effectively in managing aphthous stomatitis and Behcet's disease.<sup>16</sup>

**Table 1:** Mean VAS scores for burning sensation

Type of treatment	Visit	VAS Mean	Std .deviation
Rebamipide (gp-1 of 15)	First	4.7	1.94
	Second	3.2	1.68
	Third	1.8	1.68
	Fourth	0.8	0.91
	Fifth	0.8	0.91
Betamethasone (gp-11 of 15)	First	5.3	1.70
	Second	3.9	1.37
	Third	3.1	1.28
	Fourth	2.1	1.52
	Fifth	1.6	1.07

**Table 2:** Statistical comparative analysis between group 1 & group 11

Visits	t value	df value	P value
First	t=0.90	df=28	P=0.3753
Second	t=1.25	df=28	P=0.2214
third	t=2.38	df=28	P=0.0242
Fourth	t=2.84	df=28	P=0.0083
Fifth	t=2.38	df=28	P=0.024

Patient compliance to rebamipide therapy was assessed by asking the patient to carry the tablet strip with them during their weekly follow-up. All patients in the group completed the treatment. Significant reduction in burning sensation was seen from the initial visit to the 1-month follow-up, and none of the patients had worsening of the fibrosis or any adverse drug reaction. Our finding are consistent with study conducted by Joanna B et al(2016). It is further suggested that similar study with large sample size should be carried out to prove authenticity of efficacy of this drug in managing stomatopyrosis in OSMF. In OSMF Patients stomatopyrosis and trismus are the major cause for inability to eat. The use of newer adjunctive modalities, such as rebamipide will ease patients suffering and also encourage them to consume food.

## 6. Conclusion

Our results showed that Rebamipide was equally efficacious if not better than the Betamethasone intralesional injections. Patients treated with rebamipide shows better compliance and lack of iatrogenic fibrosis that commonly caused by repeated mucosal injections make rebamipide a painless alternative to alleviate burning sensation in patients with OSMF. More studies with large subjects should be carried out for more authenticity of findings and scientific basis of its clinical implications.

## 7. Source of Funding

None.

## 8. Conflict of Interest

The authors declare no conflict of interest.

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