

Comparison of Intralesional Infiltration of Dexamethasone plus Hyaluronidase in Management of Patients with OSMF

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Abstract:

Background: The purpose of this investigation was to compare the efficacy of intralesional dexamethasone and hyaluronidase therapy with and without ultrasound therapy in the treatment of OSMF patients.

Methods: The present investigation included 30 OSMF patients of both genders based on their medical history and clinical manifestations. Patients of all ages, gender, and stages of OSMF were randomly divided into two groups using a single-blind randomization procedure. Each cohort had 15 individuals.

Results: In group A, the mean age was 35.4 years, while in group B, it was 32.8 years. 14 males and 6 females were enlisted in the study out of a total of 30 participants. All patients in group A experienced a complete reduction in burning sensation, while two patients in group B experience a moderate persistence of burning sensation. All patients demonstrated a highly significant increase in mouth opening, although group A demonstrated a marginally greater degree of improvement than group B.

Conclusion: Future directions for the management of OSMF should therefore include the development of treatment regimens that combine multiple medications or employ sequential therapy.

Keywords: Dexamethasone, Hyaluronidase, OSMF, Ultrasound Therapy, Intralesion.

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Introduction

Oral Submucous Fibrosis (OSF) is a chronic disease that occurs almost exclusively in Indians and to a lesser degree in other Asians [1]. Dentists in many developed nations will encounter this disease in the near future [1] due to the increase in immigration from the Indian subcontinent. Numerous treatments, including medication management, surgical therapy, and physiotherapy, have been tried with varying degrees of success, but none have been able to cure this disease [2]. This is primarily due to the lack of a complete understanding of the disease's aetiology and its progressive nature. The idiopathic nature of this condition suggests new avenues for its management [3], as opposed to continuing the limited available modalities of therapy.

Several factors play a role in the etiopathogenesis of OSMF, and current evidence suggests that arecoline in the areca nut is the causal agent [4-6]. The practise of chewing betel quid is prevalent in India and Southeast Asia. And it is widespread among adolescents and young adults [7]. The buccal mucosa, faucial column, and soft palate are

primarily affected. Additionally, underlying and masticatory muscles may be implicated. The mucosa in affected areas progressively turns white, followed by progressive stiffening of the subepithelial tissues [8]. In OSMF patients, the incidence of malignancy is approximately 8% higher than in the affected Indian population as a whole [8].

Numerous studies on the effects of various pharmaceuticals and physical therapies for the treatment of OSMF [4] have been conducted. However, physical therapy, such as ultrasound therapy, which has been found to be beneficial in musculoskeletal disorders such as fibromyalgia, acute periarticular inflammatory conditions, and osteoarthritis, has been less studied in OSMF [5]. Ultrasonic waves penetrate the epidermis to cause vibrations in tendons and soft tissues, resulting in gentle deep tissue heating that reduces pain and inflammation and accelerates the healing process in OSMF patients [6]. The purpose of this study is to objectively compare the efficacy of oral pentoxifylline and conventional intralesional steroid therapy with dexamethasone and

hyaluronidase in the treatment of osteochondritis dissecans.

Materials and Methods

The present investigation included 30 patients of both sexes with OSMF based on their habitual history and clinical findings, which included the presence of a burning sensation in the mouth, blanching and loss of oral mucosal stiffness, presence of fibrous bands, and restricted mouth opening. Then, patients who met the following inclusion and exclusion criteria were chosen. After the final selection, patients of all ages, gender, and stages of OSMF were randomly assigned to one of two groups in a single-blind fashion.

Group A: Pentoxifylline group

Group B: Dexamethasone group

Inclusion Criteria

- Patient with age group of 20 to 60 years, both Gender.
- Patients who satisfy the characteristic clinical features of OSMF
- Patients who are not taking any medication for their disease condition.

Exclusion Criteria

- Patients with chronic systemic diseases like cardiac, cerebrovascular, Respiratory, Renal, Hepatic, Gastrointestinal complications, collagen disorders, infectious diseases, bleeding disorders and diabetes mellitus.
- Patients with severe restricted mouth opening (< 15mm).
- Pregnancy and lactation.
- Patient intolerance to caffeine and theophylline.
- Patients not willing to participate in the study.

Data Collection

In the study evaluating the effectiveness of the medications, burning sensation and mouth opening were included as clinical parameters. The USG parameters submucosal thickness and echogenicity were included.

Using a Visual Analogue Scale (VAS) ranging from 0 to 10 with 10 mm division, the intensity of burning sensation was measured, with 0

representing no burning sensation and 10 representing the worst conceivable burning sensation. The patients were instructed to place a mark on the VAS that best reflected their level of symptoms. At each successive visit following the administration of the drug therapy, the score was recorded.

The interincisal mouth opening was measured and recorded in centimetres using a divider and scale from the mesio-incisal angle of the upper central incisor to the mesio-incisal angle of the lower central incisor. If the corresponding teeth are absent, contralateral or adjacent teeth will be taken into account. Different intraoral sites were examined for mucosal blanching, consistency, fibrous bands, and the presence of other lesions.

Statistical Analysis

The statistical analysis was conducted using version 18 of the SPSS computer software. The percentage distribution of age groups and gender within each group was calculated, as was the aggregate distribution. The overall distribution of OSMF stages in the sample population was determined. In relation to stages, the distribution of searing sensation, mouth opening, and submucosal thickness was also calculated. In each study group, the arithmetic mean and standard deviation were estimated for various variables.

A test based on independent samples was used to analyse the association between staging and the variables used in this study. Using a paired sample test, variables within each group were analysed. The independent t test was used to compare group variables. The Pearson Co-relation test was used to determine if there was a correlation between mandible opening and submucosal thickness. In this investigation, $p < 0.05$ was considered to be statistically significant.

Results

The study included 30 patients ranging in age from 23 to 54 years, with a mean age of 35.4 years in group A and 32.8 years in group B (Table 1). The maximum number of participants was between the ages of 26 and 30, and the minimum was between 46 and 55. Table 1 displays that 14 of the 30 study participants were male and 6 were female. Male preference was observed.

Table 1: Demographic Distribution

		Group A	Group B
Age (years)	Mean age	35.4	32.8
	Range	23-54	23-43
Sex (n=30)	Male	12	12
	Female	3	3

In the present study, all patients in group A experienced a complete reduction in burning sensation, while two patients in group B experienced a moderate persistence of burning sensation. In contrast, both groups demonstrated a highly significant decrease ($p < 0.001$) in searing sensation (Table 2).

Table 2: Comparison of burning sensation between groups

Group	Pre-Operative		Post-Operative		p value
	Mean	SD	Mean	SD	
Group A	6.66	± 2.58	0.00	± 0.00	0.000**
Group B	6.53	± 2.26	0.13	± 0.35	0.000**

In the present study, all patients in both groups demonstrated a highly significant increase in mouth opening ($p < 0.001$), but group A demonstrated a slightly greater degree of improvement (mean- 4.53mm) than group B (mean- 2.83mm) (Table 3). In group A, the maximum increase in mouth aperture was 7mm and the minimum was 3mm, whereas in group B, the respective values were 4mm and 2mm (Table 3).

Table 3: Mouth Opening in Groups A and B

	Group A		Group B	
	Mean	SD	Mean	SD
Before	25.66	± 5.32738	27.20	± 5.69712
After	30.20	± 6.02613	29.93	± 5.79984
Difference	4.53	± 1.18723	2.73	± 0.70373

In this study, the aggregate mean pre-operative submucosal thickness of buccal mucosa ranges from 0.43mm to 1.12mm, with a mean of 0.722 mm. The mean preoperative submucosal thickness of buccal mucosa in group A ranges from 0.46 mm to 1.12 mm and is approximately 0.715 ± 0.166 mm. For the right side, it is approximately 0.698 ± 0.157 mm and for the left side, it is approximately 0.731 ± 0.157 mm. The overall mean post-operative submucosal thickness of buccal mucosa in group A is approximately 0.4943 ± 0.14628 mm with a range of 0.26 mm to 0.84 mm (Table 4). The corresponding values for the right side are approx-

imately 0.482 ± 0.134 mm and the left side is approximately 0.506 ± 0.161 mm, both of which are highly significant. In group B, the mean submucosal thickness ranges from 0.43 mm to 1.08 mm and is approximately 0.729 ± 0.188 mm, whereas the right side is approximately 0.748 ± 0.197 mm, and the left side is approximately 0.709 ± 0.183 mm. The overall improvement is approximately 0.598 ± 0.181 mm, ranging from 0.43 mm to 1.08 mm, while the improvement on the right side is approximately 0.6207 ± 0.18786 mm and the improvement on the left side is approximately 0.5753 ± 0.17948 mm (Table 4).

Table 4: Submucosal Thickness in groups A and B

	Group A				Group B			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Right Side	0.69	± 0.15	0.48	± 0.13	0.74	± 0.19	0.62	± 0.18
Left Side	0.69	± 0.15	0.48	± 0.13	0.70	± 0.18	0.57	± 0.17
Both Sides	0.7150	± 0.16604	0.4943	± 0.14628	0.7290	0.18830	0.5980	0.18199

Discussion

In our study, patients in group A received 400 mg of pentoxifylline thrice daily for three months, while patients in group B received 1 ml of dexamethasone with 1500 I.U. of hyaluronidase in 0.5 ml of local anaesthesia biweekly for six weeks. The recommended adult dosage of oral pentoxifylline for hemorrhologic indications is 400 mg three times daily with meals, which is also prescribed for the majority of other clinical applications [9]. Few clinical trials on the efficacy of pentoxifylline in the treatment of OSMF have been reported as of yet. Anjum et al. conducted a study in which 400 mg of pentoxifylline was administered twice or thrice daily for three months [10]. This study demonstrated significant clinical improvement with minimal adverse effects. Therefore, we determined

on a three-month regimen of thrice-daily administration.

The study included 30 patients ranging in age from 23 to 54 years, with the mean age in group A being 35.4 years and in group B being 32.8 years. This study's age distribution correlates with that reported by other authors [11]. 24 males and 6 females were enlisted in the study out of a total of 30 participants. Male preference was observed. All 30 participants in the study had a propensity of pan chewing. In another study from Chennai, only one patient out of 185 did not have a history of consuming areca nuts [12].

Common symptoms include a searing sensation in the mouth, reduced mouth opening, decreased salivation, and an altered sense of taste. Burning sensation may be caused by an atrophic epithelium, but

morphologic evidence of increased cell mortality was not observed in OSMF epithelium when compared to adjacent healthy oral mucosa [13]. Stomatitis caused by nutrient deficiency may also result in a searing sensation. Several researchers have documented nutritional deficiencies in OSMF patients, including anaemia, vitamin, iron, and protein deficiencies [14]. The sensation of burning may also be exacerbated by xerostomia, which is observed in the advanced phases of the disease.

The most debilitating characteristic of OSMF is its restricted oral opening. As the disease progresses, the submucosal layer of the oral soft tissues develops dense fibrous bands. This progressive oral fibrosis is typically bilateral and produces a tightening of the mouth. In our investigation, the mouth opening ranged from 16 to 36 millimetres. 76% of patients in a study conducted in Chennai had a mouth aperture between 20 and 45mm [15]. All 30 participants in the study demonstrated a significant increase in mandible opening. However, the pentoxifylline group demonstrated a marginally higher percentage than the dexamethasone group (10.04%).

In the study by Anjum et al. [10], the dexamethasone group performed better than the pentoxifylline group. In contrast, all of the parameters in their study were clinical, including burning sensation, mouth opening, and facial flexibility. In addition, they prescribed pentoxifylline twice daily for the first four weeks, which may have affected the outcome of their study.

Conclusion

In this study, both pentoxifylline and dexamethasone significantly improved mandible opening and decreased burning sensation. It appears that pentoxifylline is well tolerated. Two patients experienced adverse effects, but neither had cause to discontinue treatment. Therefore, pentoxifylline can be a suitable alternative in the management of OSMF for patients who cannot make frequent visits or who wish to avoid injection-related pain and for whom intralesional steroids or hyaluronidase are contraindicated. And most importantly, pentoxifylline is more patient-friendly and cost-effective. Future directions for the management of OSMF should therefore include the development of treatment regimens that combine multiple medications or employ sequential therapy. Despite the fact that the individual response to pentoxifylline treatment showed significant improvement, additional research is necessary to establish the role of pentoxifylline in the observed therapeutic effects. There is an urgent need for high-quality randomised controlled trials and increased global awareness of the disease in order to increase the flow of research data and investigate potential treatment approaches. Lastly, OSMF is preventable; simple public health

education regarding the detrimental effects of chewing areca and other products could go a long way towards combating this debilitating disease.

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