

# Study of Serum Malondialdehyde and Calcitriol Level in Oral Submucous Fibrosis Patients

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## ABSTRACT

**Introduction:** oral submucous fibrosis is a frequently seen precancerous condition of oral cavity. Chewing of areca nut is the most common etiological agent associated with it. Malondialdehyde is a toxic product formed as a result of lipid peroxidation reacts with DNA leading to its mutagenic transformation. Calcitriol is believed to have antineoplastic properties. The aim of the present study was to evaluate the levels of serum malondialdehyde and calcitriol in patients with oral submucous fibrosis.

**Material and methods:** the study was conducted over a 4 months period and 100 patients were enrolled in the study. Patients were divided into case and control group. Each group had 50 patients. 5 ml of blood was withdrawn from antecubital vein and used for estimation of serum calcitriol and malondialdehyde. Student's t test was used for analysis.

**Result:** The mean level of malondialdehyde amongst case group was 396.76 +/- 12.21 and that amongst control group was 250.34 +/- 9.80. This difference was statistically significant. The level of serum calcitriol amongst case group was 24.57 +/- 10.21 ng/ml and that among control group was 30.32 +/- 11.39 ng/ml. The difference between the groups was statistically not significant.

**Conclusion:** Calcitriol is believed to have antineoplastic activity but its level does not decrease significantly amongst patients with OSMF. Malondialdehyde levels show a marked increase in OSMF patients.

**Keywords:** Anticubital, Antineoplastic, Calcitriol, Malondialdehyde

## INTRODUCTION

Oral submucous fibrosis is a commonly occurring precancerous condition that affects the oral cavity. It is most commonly seen in individuals residing in Indian subcontinent and in South Eastern Asian region like Taiwan.<sup>1</sup> In 1952, Schwartz described it as "A trophic Idiopathica (Tropica) Mucosae oris". Later it came to be known as Oral submucous fibrosis.<sup>2</sup> By definition it can be described as insidious chronic disease affecting any part of oral cavity and sometimes pharynx. Although occasionally preceded by and/or associated with vesicle formation, always associated with Juxtaepithelial inflammatory reaction followed by fibro elastic change of lamina propria with epithelial atrophy leading to stiffness of oral mucosa and causing trismus and inability to eat.<sup>3</sup> It has a multifactorial etiology which includes genetic susceptibility, nutritional deficiencies, consumption of chillies, areca nut chewing, alteration in salivary constituents, collagen disorders etc.<sup>1</sup> Amongst this areca nut chewing is considered as the most common etiological agent associated with generation of free radicals. It stimulates excessive collagen synthesis by human fibroblasts in culture leading to formation of dense fibrotic bands.<sup>4</sup> Cytotoxic effects of areca nut chewing are mediated by the production of reactive oxygen species

which causes lipid peroxidation, thus modifying the structure and function of cell membrane leading to loss of cell membrane homeostasis.<sup>5</sup>

Malondialdehyde is a toxic product formed as a result of lipid peroxidation reacts with DNA leading to its mutagenic transformation. It also reacts with functional group of lipoproteins and proteins leading to carcinogenesis.<sup>6</sup> Calcitriol are believed to have antineoplastic properties. It induces apoptosis and inhibits invasiveness and formation of new blood vessels. The aim of the present study was to evaluate the levels of serum malondialdehyde and calcitriol in patients with oral submucous fibrosis.

## MATERIAL AND METHODS

The study was conducted Dept of Pharmacology, RIMS, Ranchi over a period of 4 months (August, 2015- December, 2015). A total of 50 patients diagnosed with oral submucous fibrosis were included in the study. Diagnosis was based on history, clinical and histopathological examination. Patients above the age of 25 years without any underlying systemic disease were included in the study. ASA grade III and IV patients were excluded from the study. Two groups were made, Group I (OSMF patients) and Group II (Control). All the patients were informed about the study and a written informed consent was obtained from all. Ethical committee clearance was also obtained.

## Procedure

5ml of venous blood was withdrawn from antecubital vein by trained personnel. The blood was then centrifuged at 3000 rpm for 10 minutes. The separated serum was used for estimation of malondialdehyde and calcitriol levels. Malondialdehyde was estimated by thiobarbituric acid reactive species method and calcitriol was estimated by radioimmunoassay.

## STATISTICAL ANALYSIS

Data was analysed by SPSS software. Student's t test was used for analysis. P value of less than 0.05 was considered significant.

## RESULTS

The present study aimed at comparing the levels of malondialdehyde and calcitriol amongst patients with and without oral submucous fibrosis. Table 1 reveals the mean serum

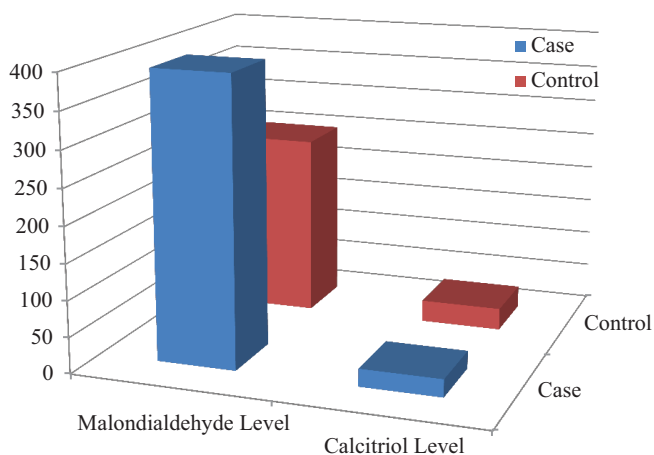
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	Malondialdehyde Levels		Calcitriol Levels	
	OSMF	Control	OSMF	Control
N	50	50	50	50
Mean	396.76	250.34	24.57 ng/ml	30.32 ng/ml
Standard deviation	12.21	9.80	10.21	11.39
P value	<0.05		>0.05	

**Table-1:** Estimated levels of malondialdehyde and calcitriol amongst patients



**Figure-1:** malondialdehyde level and calcitriol level in case and control.

levels of malondialdehyde and calcitriol amongst both case and control group. The mean level of malondialdehyde amongst case group was 396.76 +/- 12.21 and that amongst control group was 250.34 +/- 9.80. This difference was statistically significant. The level of serum calcitriol amongst case group was 24.57 +/- 10.21 ng/ml and that among control group was 30.32 +/- 11.39 ng/ml. The difference between the groups was statistically not significant.

## DISCUSSION

Till present date many studies have been conducted estimating the level of serum malondialdehyde, serum vitamin C, serum iron, superoxide dismutase amongst patients with or without OSMF. In our present study the level of malondialdehyde shows a significant increase in patients with oral submucous fibrosis. The results of our study are in accordance with various other studies estimating the levels of malondialdehyde. A study conducted by Tejasvi et al in 2017, showed that there was no significant difference in the levels of malondialdehyde amongst patients with different grades of oral submucous fibrosis. On the contrary, a study conducted by Bhat and Dholakia showed that increase in serum malondialdehyde levels as the grading progressed to higher levels. Rajendran et al showed that vitamin and iron deficiency leads to a state of malnourishment leading to derangement in inflammatory repair response which further leads to derangement in healing and hence oral submucous fibrosis.

Apoptosis i.e. programmed cell death is a genetically regulated phenomenon that lead to deletion of normal as well as malignant cells. Resistance to apoptosis is associated with carcinogenesis. Calcitriol is associated with antineoplastic activity by inducing apoptosis. Serum levels of calcitriol and vitamin D receptor acts as a guide during supportive treatment of patients with oral submucous fibrosis. In our present study no significant

difference was seen in calcitriol levels amongst patients with or without oral submucous fibrosis. A study done by Grimm et al in estimating the level of vitamin D and receptor amongst patients of oral cancer and precancerous lesions showed that vitamin D deficiency was detected amongst oral squamous cell carcinoma patients but the difference was not significant.

The present study had certain drawbacks associated with it. The sample size was very small, had the sample size being larger the results would have varied. Grading of oral submucous fibrosis was not taken into consideration. It would have given a better picture in relation to the level of malondialdehyde and calcitriol and oral submucous fibrosis.

## CONCLUSION

Oral submucous fibrosis patients show a, marked increase in level of malondialdehyde compared to mild decrease in calcitriol levels. Supplementing Vitamin D could lead to improvement in condition because of its antineoplastic activities.

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