

## ORIGINAL RESEARCH

# Analysis of iron levels in serum of oral submucous fibrosis patients

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### ABSTRACT

**Background:** OSMF causes iron deficiency as a result of inadequate eating patterns and burning sensations, making it impossible to consume a normal diet and resulting in poor feeding. This study was conducted to assess serum iron levels in subjects having oral submucous fibrosis. **Material and methods:** 50 OSMF patients with clinical diagnoses and histological confirmation participated in a hospital-based clinical research. Patients in the OSMF group had a habit of chewing areca nuts or one of its commercial preparations, burning sensation, difficulty eating spices, rigid buccal mucosa, vesicle development, ulceration, and blanching of oral mucosa. Patients who chewed solely tobacco, had any systemic issues, were afflicted with a serious illness, or had a habit of chewing areca nuts or one of their commercial preparations without OSMF were eliminated. According to Pindborg's staging, the OSMF group was clinically staged into stages I and II. 50 healthy adults, matched for gender and age, who had no recent serious illnesses or a history of chewing tobacco or areca nuts were included as controls. **Results:** The study group (OSMF group) comprised of 50 cases with age between 17 and 44 years with a mean age of 26.5 years. The maximum numbers of cases were between 21 and 25 years. The OSMF group showed male predominance with 43 males and 7 females. Mean value of serum iron levels of Control group was 142.27 mcg/dL, whereas that of OSMF group was 63.71 mcg/dL respectively. On comparison of OSMF group with the Control group, OSMF group showed significantly lower levels of serum iron with  $P < 0.0001$ . Interstage comparison of OSMF stage II group with the Control group, and OSMF stage II group showed significantly lower levels of serum iron with  $P < 0.0001$ . **Conclusion:** It was concluded that the serum iron levels in subjects having oral submucous fibrosis were significantly lower in comparison to the control group.

**Keywords:** serum iron, oral submucous fibrosis

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### INTRODUCTION

Oral submucous fibrosis (OSMF) precancerous condition and is chronic, resistant disease characterized by juxta-epithelial inflammatory reaction and progressive fibrosis of the submucosal tissues. In 1966, Pindborg[1] defined OSMF as "an insidious chronic disease affecting any part of the oral cavity and sometimes pharynx. It is associated with juxta-epithelial inflammatory reaction followed by fibroelastic changes in the lamina propria layer, along with epithelial atrophy which leads to rigidity of the oral mucosa proceeding to trismus and difficulty in mouth opening." Other terms used to describe this condition are juxta-epithelial fibrosis, idiopathic scleroderma of the mouth, idiopathic palatal fibrosis, submucous fibrosis of the palate and pillars, sclerosing stomatitis, and diffuse OSMF.[2] Hemoglobin levels, in particular serum iron levels, are considered as biochemical indicators for nutritional

assessment [3]. Deficiency of iron, Vitamin B-12, and folate can affect the integrity of the oral mucosa. Significant hematological abnormalities have been reported in OSMF, including an increased blood sedimentation rate, and a decrease in serum iron and an increase in total iron binding capacity [4]. Hence, the current study was undertaken to evaluate serum iron levels in subjects having oral submucous fibrosis.

### MATERIAL AND METHODS

50 OSMF patients with clinical diagnoses and histological confirmation participated in a hospital-based clinical research. Patients in the OSMF group had a habit of chewing areca nuts or one of its commercial preparations, burning sensation, difficulty eating spices, rigid buccal mucosa, vesicle development, ulceration, and blanching of oral mucosa. Patients who chewed solely tobacco, had any systemic issues, were afflicted with a serious illness,

or had a habit of chewing areca nuts or one of their commercial preparations without OSMF were eliminated. According to Pindborg's staging, the OSMF group was clinically staged into stages I and II. 50 healthy adults, matched for gender and age, who had no recent serious illnesses or a history of chewing tobacco or areca nuts were included as controls. The control group did not include any subjects with habits or who had recently had systemic illness. Participants in the study gave their informed consent and the study received institutional ethical approval. In order to estimate the serum sample for serum levels of iron by utilising the Ferrene method, 5 mL of fasting venous blood was drawn. The statistical analysis was conducted using SPSS software, version 11.

## RESULTS

The study group (OSMF group) comprised of 50 cases with age between 17 and 44 years with a mean age of 26.5 years. The maximum numbers of cases were between 21 and 25 years. The OSMF group showed male predominance with 43 males and 7 females. Mean value of serum iron levels of Control group was 142.27 mcg/dL, whereas that of OSMF group was 63.71 mcg/dL respectively. On comparison of OSMF group with the Control group, OSMF group showed significantly lower levels of serum iron with  $P < 0.0001$ . Interstage comparison of OSMF stage II group with the Control group, and OSMF stage II group showed significantly lower levels of serum iron with  $P < 0.0001$ .

**Table 1: Prevalence of OSMF.**

OSMF	Number of subjects	Percentage
Present	50	50%
Absent	50	50%
Total	100	100%

**Table 2: Gender-wise distribution of subjects.**

Gender	Number of subjects having OSMF	Percentage
Males	43	86%
Females	07	14%
Total	50	100%

**Table 3: Mean values of serum iron levels in control group and study group**

Groups	Mean serum iron levels(mcg/dL)	P value
Control group	142.27	P<0.0001
Study group (OSMF)	63.71	

## DISCUSSION

Oral submucous fibrosis (OSMF) is a chronic, insidious oral mucosal condition that occurs predominantly among Indians and occasionally in other Asians. In the Indian continent alone, the statistics for OSMF is about 5 million people (0.5%) of the population [5]. The reasons for the rapid increase of the disease are reported to be due to an upsurge in the popularity of commercially prepared areca nut preparations (pan masala) in India and an increased uptake of this habit by young people due to easy access, effective price changes, and marketing strategies [6].

Iron is a critical component of nucleic acids and collagen, as well as being involved in the formation and preservation of the oral mucosa [7]. Iron deficiency anemia (IDA) is characterized by weakness, achlorhydria, epithelial atrophy, lack of concentration, irritability, dyspnea, and impaired memory due to low serum iron levels. Dysphagia is due to the presence of irregular esophageal webs that are predisposed to becoming malignant. Epithelial atrophy, thick corium, and enhanced collagen synthesis are the signature histopathological characteristics of OSMF [8,9].

IDA was higher in 47 OSMF patients (94%) than in stable controls. Many experiments have come up with

contradictory findings. Wahi et al. [10] found anemia in 6% of males and 11% of female OSMF patients, but the prevalence of anemia in subjects did not vary significantly from the controls.

Bhardwaj et al. [11] found a gradual reduction in serum iron and Hb levels from stage I OSMF to stage IV OSMF in 120 participants, as was found in the current study. The findings of our analysis are similar to Karthik et al. [12], Khanna et al. [13], and Lavina et al. [14].

## CONCLUSION

It was concluded that the serum iron levels in subjects having oral submucous fibrosis were significantly lower in comparison to the control group.

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