

## Estimation of salivary & serum level in oral submucous fibrosis patients

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### Abstract

**Background:** Oral submucous fibrosis (OSMF) is also considered as an Asian version of sideropenic dysphagia, wherein chronic iron deficiency leads to mucosal susceptibility to irritants, such as chillies and areca nut products. Iron content can thus be a predictor for the progression of the condition therefore, biochemical assessment of oral precancerous conditions may help in early diagnosis and prognosis. Hence, the present study was aimed to evaluate serum and salivary iron level in OSMF patients.

**Aim:** The aims of this study were to estimate the levels of iron in saliva and serum of patients with OSMF and to correlate change in levels of iron with the histopathological grading of OSMF.

**Materials and Methods:** The study group comprised of 30 clinically diagnosed and histopathologically confirmed cases of OSMF; 10 age- and sex-matched controls were also enrolled in the study. Blood and saliva was collected and they were subjected for analysis by using atomic absorption spectrometry and a differential pulse anodic stripping voltmeter.

**Results:** Both salivary and serum iron levels were decreased in OSMF patients.

**Conclusions:** Iron may have been used for the excessive collagen synthesis occurring during progression of OSMF. Hence salivary and serum monitoring may play a crucial role in the early diagnosis and prognosis of OSMF.

**Keywords:** estimation of salivary, serum level, submucous

### Introduction

Iron is one of the most abundant and necessary transition metals in the body, which is an essential component in DNA synthesis and in respiratory and oxidative metabolism [1]. Recent studies have revealed depleted iron levels in patients with oral pre-cancerous lesions [2,3].

OSMF is a fibrotic condition of the oral cavity and is always associated with chronic epithelial inflammation and progressive deposition of collagenous extracellular matrix (ECM) proteins in the sub epithelial layer of the buccal mucosa [4]. The disease is seen in those from Indian subcontinent and from many parts of South-East Asia such as Taiwan [5]. We carried out a study with an objective of assessing the status of serum and saliva in different histopathological grades of OSMF.

### Material & Method

40 patients between the age range of 20 and 40 years were enrolled into the study. The study subjects included 30 Histopathological confirmed cases of OSMF (10 patient in each grade of OSMF according clinic pathological correlation) and 10 age- and sex-matched healthy controls. A detailed case

history that included habit index was taken from each subject in the study. Subjects with any other long-term systemic illness and long-term medication were excluded from the study. 5cc of blood was collected for serum and stimulated saliva (10ml) in the morning session. To the collected serum and saliva; after quantifying them, 2ml of electronic grade concentrated nitric acid and 1ml of concentrated perchloric acid were added. The mixture was boiled till the acid evaporated and a white residue remained. To this, 0.25% nitric acid was added and the solution was warmed up. On cooling, the solution was transferred to 5ml volumetric flasks and a more dilute solution was added to make up the volume to 5 ml. The digested serum and saliva samples were subjected to an analysis of the trace elements (copper, zinc, iron and magnesium) by using atomic absorption spectrometry and a Differential Pulse Anodic Stripping Voltmeter (DPASV).

### Result

The OSMF subjects were graded clinic histo pathologically into three categories (Grade I, II, III) which contain 10 patients in each group. Mean salivary & serum iron levels were significantly decreased as the histopathological grading

progressed; there was a very highly significant difference among the three groups and also when compared with controls (Table 1, 2).

**Table 1:** Mean value of iron level in Saliva of OSMF patients & control group

Group	Mean (µg/ml)
Grade I	0.1367
Grade II	0.1254
Grade III	0.1185
Controls	0.1589

**Table 2:** Mean value of iron level in serum of OSMF patients & control group

Group	Mean (µg/ml)
Grade I	0.6399
Grade II	0.5487
Grade III	0.4366
Controls	0.836

**Discussion**

Epidemiologic studies have established the role of diets rich in vegetables and fruits in oral carcinogenesis, with important contribution of vitamins and iron in maintenance of oral mucosa [6]. Iron plays an important role in development, maintenance and defence abilities of oral mucosa. It effects the ability of iron containing enzymes which require heme, biological oxidations, and transport is necessary for DNA, RNA, collagen and antibody synthesis [7, 8]. Anemia can be treated by increase iron intake, either by diet diversification, supplementation, or fortification of foods. The best long-term approach in reduction of the incidence of iron deficiency is food fortification [9]. Oral submucous fibrosis is also considered as an “Asian version of Sideropenic dysphagia”. Chronic iron deficiency leads to mucosal exposure to irritants such as arecanut [11]. Peptidyl lysine hydroxylase requires molecula oxygen, ferous iron, alpha-ketoglutratre and ascorbic acid to form collagen type I coupled with loss of more soluble collagen type III and type IV [10, 11]. In eastern countries, Oral submucous fibrosis (OSMF) may be the manifestation of chronic iron (Fe) deficiency and a counterpart of Plummer-Vinson syndrome. The reasons of iron deficiency in OSMF patients could be multifactorial. It may be due to its utilization in collagen formation by the process of hydroxylation of proline and lysine, altered epithelial cell turnover rate or depletion of nutrients due to pronounced difficulty in mastication [12]. We found a significant decrease in the levels of iron in both serum and saliva as the histopathological grades of OSMF progressed. This indicated that iron may have been used for excessive collagen production and cross-linking occurring in OSMF. Hence, serum and salivary iron levels could be an important indicator for the progression of OSMF.

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