

## **Role of diet in Leukoplakia and Oral submucous fibrosis**

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### **Role of diet in Leukoplakia and Oral Submucous Fibrosis**

**Running title:** Diet & leukoplakia and Oral submucous fibrosis

#### **ABSTRACT**

**Background:** Leukoplakia is considered as one of the commonly occurring potentially malignant disorder. The main etiological factor is smoking. Oral submucous fibrosis (OSMF) is cause of frequent use of arecanut. The present study was conducted to role of diet in leukoplakia and Oral submucous fibrosis.

**Materials & Methods:** A total of 50 subjects with leukoplakia and/or oral submucous fibrosis were included in the study (Group-I). Equal number of healthy subjects was also enrolled as the control group (Group-II). Assessment of dietary component was performed using FFQ (Food Frequency Questionnaire).

**Results:** Non-significant differences ( $p>0.05$ ) were observed between the observed mean values in case and control group with respect to total energy (Kcal/day), total fat (g/day), fat (% energy), Fibre (g/day), Iron (mg/day), Sodium (mg/day), Copper (mg/day), Zinc (mg/day)

and Calcium (mg/day). A protective role of tomatoes with Leukoplakia was observed ( $p < 0.05$ ) and not with OSMF.

**Conclusion:** Intake of specific nutrients may have a role in the development of oral precancerous lesions.

**Keywords:** Diet, Precancerous lesions, Leukoplakia

## Introduction

Oral cancer is the sixth commonest cancer in the world. Its frequency is chiefly high in India, some other countries in Asia. It has been observed that smoking and alcohol drinking are major risk factors, whereas in India, the chewing of tobacco products, in addition to smoking in various forms, is primarily responsible for the high incidence. The WHO has estimated that 90% of oral cancers in India among men are attributable to the chewing and smoking of tobacco.

Leukoplakia is considered as one of the commonly occurring potentially malignant disorder. The main etiological factor is smoking. Oral submucous fibrosis (OSMF) is cause of frequent use of arecanut.

Dietary factors are estimated to account for approximately 30% of cancers in Western countries. This proportion is currently thought to be about 20% in developing countries and is projected to increase in the future. Studies have revealed that a diet low in fresh fruits and vegetables is a significant risk factor for oral cancer in young subjects. Research revealed an inverse dose–response relationship between BMI and risk of leukoplakia. The present study was conducted to role of diet in leukoplakia and Oral submucous fibrosis.

## Materials & Methods

The present study was conducted by the Department of Dentistry, Sri Krishna Medical College & Hospital, Muzaffarpur, Bihar after obtaining institutional ethical clearance. A total of 50 subjects with leukoplakia and/or oral submucous fibrosis were included in the study group (Group-I). Equal number of healthy subjects was enrolled as the control group (Group-II). Their involvement was done after they agreed to participate in the study.

Demographic data of each subject was recorded such as name, age, gender etc. The assessment of dietary component was performed using FFQ (Food Frequency Questionnaire)

as suggested by Gupta et.al. (1998). Results were tabulated and subjected to statistical analysis. A p value less than 0.05 was considered significant.

## Results

**Table I Distribution of subjects**

Groups	Group I	Group II
Status	Cases	Control
M:F	35:15	30:20

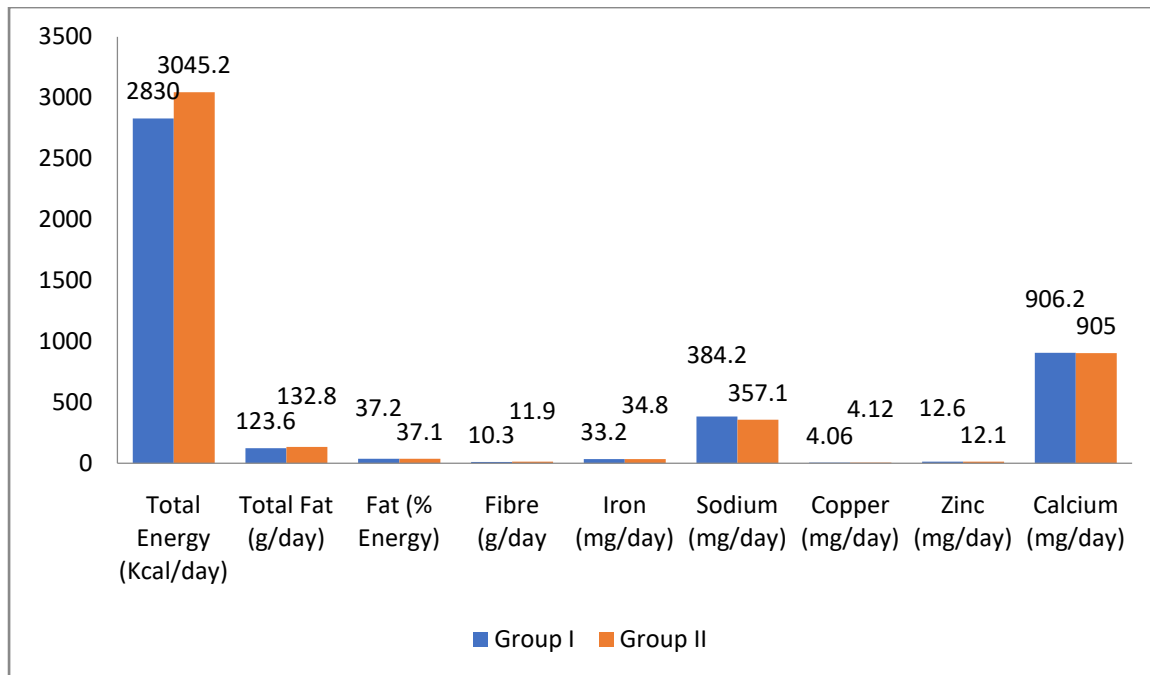
Table I shows that group I had 35 males and 15 females and group II had 30 males and 20 females.

**Table II Assessment of parameters**

Variables	Group I	Group II	P value
Total energy (Kcal/day)	2830	3045.2	0.05
Total fat (g/day)	123.6	132.8	0.09
Fat (% Energy)	37.2	37.1	0.12
Fibre (g/day)	10.3	11.9	0.05
Iron (mg/day)	33.2	34.8	0.16
Sodium (mg/day)	384.2	357.1	0.11
Copper (mg/day)	4.06	4.12	0.92
Zinc (mg/day)	12.6	12.1	0.94
Calcium (mg/day)	906.2	905.0	0.98

Table II & graph I shows that total energy (Kcal/day) in cases was 2830 and in control was 3045.2, total fat (g/day) in cases was 123.6 and in control was 132.8, fat (% energy) in group I was 37.2 and in group II was 37.1, fibre (g/day) in group I was 10.3 and in group II was 11.9, iron (mg/day) in group I was 33.2 and in group II was 34.8, sodium (mg/day) in group I was 384.2 and in group II was 357.1, copper (mg/day) was 4.06 in group I and 4.12 in group II, zinc (mg/day) in group I was 12.6 and 12.1 in group II and calcium (mg/day) was 906.2 in group I and 905.0 in group II. The difference was non-significant ( $p > 0.05$ ).

## Graph I Assessment of parameters



**Table IV Adjusted odds ratios for foods in relation to submucous fibrosis and leukoplakia in diet**

<b>Leukoplakia</b>		
<b>Food</b>	<b>Odds ratio</b>	<b>P value</b>
Pulse	0.41	0.07
Root	0.62	0.06
Tomato	0.76	0.04
Other vegetables	0.34	0.1
<b>OSMF</b>		
<b>Food</b>	<b>Odds ratio</b>	<b>P value</b>
Root tuber	0.70	0.5
Onion	0.52	0.4
Fruit	0.84	0.2
Wheat	0.92	0.01

Table IV showed strong correlation of diet with Leukoplakia and not with OSMF.

### **Discussion**

Nutritional risk factors have also been implicated in cancers of the oral cavity. A number of studies have indicated that the consumption of various vegetables and fruits reduces risk. These relationships may be independent of other risk factors and show a dose-

response. There is substantial potential for mystifying, and this may be difficult or unbearable to switch in most epidemiologic studies on the subject. Oral cancer is often preceded by oral precancerous lesions and conditions. Equally, the relative risk of persons with oral precancerous lesions developing oral cancer has been established to be very high, even after regulatory for the use of tobacco. The association of oral precancerous lesions with tobacco habits follows a pattern similar to that of oral cancer. Because the prevalence of oral precancerous lesions is much higher than that of oral cancer, these lesions provide useful clinical markers for oral cancer. They have been used as such in large-scale intervention trials. The present study was conducted to role of diet in leukoplakia and Oral submucous fibrosis.

In present study, group I had 35 males and 15 females and group II had 30 males and 20 females. Gupta et al<sup>11</sup> conducted a study among 5018 male tobacco users, 318 were diagnosed as cases. An equal number of controls matched on age, sex, village, and use of tobacco were selected. A protective effect of fibre was observed for both oral submucous fibrosis (OSF) and leukoplakia with 10% reduction in risk per g day ( $P < 0.05$ ). Ascorbic acid appeared to be protective against leukoplakia with the halving of risk in the two highest quartiles of intake (versus the lowest quartile: OR = 0.46 and 0.44, respectively;  $P < 0.10$ ). A protective effect of tomato consumption was observed in leukoplakia and a suggestion of a protective effect of wheat in OSMF.

We observed that total energy (Kcal/day) in cases was 2830 and in control was 3045.2, total fat (g/day) in cases was 123.6 and in control was 132.8, fat (% energy) in group I was 37.2 and in group II was 37.1, fibre (g/day) in group I was 10.3 and in group II was 11.9.

We found that iron (mg/day) in group I was 33.2 and in group II was 34.8 sodium (mg/day) in group I was 384.2 and in group II was 357.1, copper (mg/day) was 4.06 in group I and 4.12 in group II, zinc (mg/day) in group I was 12.6 and 12.1 in group II and calcium (mg/day) was 906.2 in group I and 905.0 in group II. Amarasinghe et al<sup>12</sup> enrolled a total of 1029 subjects with Oral Potentially Malignant Disorders (OPMD) and disease-free controls. Among the OPMDs, those with leukoplakia were separately considered. The analysis was stratified by portions of fruit/vegetables consumed as five or more portions and two or more portions daily. A low BMI ( $<18.5$ ) was a significant independent risk factor for the development of OPMD. More than half of both cases and controls consumed less than two portions of fruit/vegetables per day and only 20 subjects consumed more than five portions per day. Intake of more than two portions per day of  $\beta$ -carotene-containing fruits/vegetables significantly reduced the risk of having an OPMD and leukoplakia. The significant

differences observed with BMI and fruits/vegetables were attenuated when adjusted for betel quid chewing, smoking and alcohol use.

The shortcoming of the study is small sample size.

### **Conclusion**

Authors found that intake of specific nutrients may have a role in the development of oral precancerous lesions.

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