Original article:

Lipid Profile in Oral Submucous Fibrosis Patients in India -A Pilot Study

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Abstract:

Introduction: Oral Submucous fibrosis is seen predominantly in Indians who chew betel quid or its variants. The predominant age group affected is 20-40 years. This study is aimed to evaluate the plasma lipid profile in OSMF patients as the change in lipid levels may have a diagnostic and prognostic role in the potentially malignant lesions.

Materials & Methods: A pilot study was conducted in 10 clinically diagnosed patients of OSMF . Fasting blood samples were collected in plain vials and there lipid profiles were analyzed in Sai Samarth diagnostic centre, Dombivli.

Results: There lipid profile when compared with the normal standardized values showed a significant decrease in serum cholesterol, LDLC and LDLC/HDLC ratio, whereas HDLC was found to be raised in some patients in the study group as opposed to controls.

Conclusion: To conclude, it appears that the lower serum lipid status may be considered as a useful indicator for initial changes occurring in the neoplastic cells

Keywords: Oral Submucous fibrosis, cholesterol, triglycerides, areca nut

INTRODUCTION

Oral submucous fibrosis (OSMF) is a chronic, debilitating disease characterised by juxtaepithelial fibrosis of the oral cavity.[1] Although occasionally preceded by, or associated with, formation of vesicles, it is always associated with a juxtaepithelial inflammatory reaction followed by fibro elastic change of the lamina propria and epithelial atrophy that leads to stiffness of the oral mucosa and causes trismus and an inability to eat [2]. Oral submucous fibrosis can be seen at any age except for young children. The predominant age group affected is 20-40 years. Compared to traditional betel quid, gutkha chewing tends to begin at a younger age and has a shorter time to the development of disease, so cases of oral submucous fibrosis have been seen as young as 11 years of age.

The pathogenesis of the disease is not well established, but the cause of OSMF is believed to be multifactorial. Factors include areca nut chewing, ingestion of chillies, genetic and immunologic processes, nutritional deficiencies, and other factors. Iron deficiency anemia, vitamin B complex deficiency, and malnutrition are promoting factors that derange the repair of the inflamed oral mucosa, leading to defective healing and resultant scarring[3]. Betel quid chewing is seen

almost exclusively in the Indian subcontinent, South East Asia and western Pacific and wherever these populations have migrated..Tilakaratne et al reported that areca nut is the main etiological factor for OSMF.[4] Excessive use of areca nut may cause fibrosis due to increased synthesis of collagen, and induce the production of free radicals and reactive oxygen species, which are responsible for high rate of oxidation/peroxidation of polyunsaturated fatty acids which affect essential constituents of cell membrane and may involve in tumorogenesis.[6,7]Because of the lipid peroxidation, there is a greater utilization of lipids for new membrane biogenesis. Cells fulfil these requirements either from circulation, by synthesis through the metabolism or from degradation of major lipoprotein fractions like VLDL, LDL or HDL.[7]Researchers have reported association of plasma/serum lipids and lipoproteins with different cancers, as cholesterol is essential for maintenance of structural & functional integrity of all biological membranes.

The present study was planned to evaluate the plasma lipid profile in OSMF patients as the change in lipid levels may have a diagnostic and prognostic role in the potentially malignant lesions.

MATERIALS AND METHODS

Clinically and Histo-pathologically proven oral submucous fibrosis patients of any age group were included in the study. Patients who have undergone or on treatment for oral submucous fibrosis , Patients with systemic diseases like Diabetes, Cardiac problems, Obesity and Patients with any previous or current history of altered level of cholesterol & Patients with any previous or current history of lipid lowering medications were excluded from present study.

A pilot study was conducted in 10 clinically diagnosed patients of OSMF who visited Department of Oral Medicine and Radiology, YMT Dental College and Hospital, Kharghar, Navi Mumbai, India. . Control group enrolled 10 healthy individuals, matched for age and sex who visited Department of Oral Medicine and Radiology, YMT Dental College and Hospital. Case proforma including the patients consent was made, to record signs, symptoms, detailed history including habits and lipid profile estimation. Ethical clearance was taken before performing the study from the parent institute.Fasting blood samples were collected in plain vials and there lipid profiles were analyzed in Sai Samarth diagnostic centre, Dombivli. Lipid profile was estimated for serum cholesterol, serum triglycerides, HDLC, LDLC and VLDLC by using Autospan reagents. The data collected was tabulated based upon the LDL, VLDL, HDL, total cholesterol and serum triglyceride levels separately for each of the two groups and subjected to statistical analysis

Fig 1

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RESULTS

A total of 10 patients of OSMF were studied. Maximum patients were in their third and fourth decade of life with a male predominance. (Table 1) On clinical grading of limited mouth opening, two patients (20%) were found to have grade I (> 3 cm), four (40%) had grade II (2-3 cm) and four (40%) had grade III (< 2 cm) . Clinical examination results showed nine 90 % patients had a difficulty in opening the mouth, 10 (100%) had blanching and fibrosis of oral mucosa, four (40%) had ulceration in the oral cavity, 8 (80%) presented with burning sensation that was exacerbated by spicy food and three patients (30%) showed depapillation of tongue.

There lipid profile when compared with the normal standardized values showed a significant decrease in serum cholesterol, LDLC and LDLC/HDLC ratio, whereas HDLC was found to be raised in some patients in the study group as opposed to controls.(Table 1 &2)

Table 1:

SR NO	AGE/SEX	LIPID PROFILE OF OSMF PATIENTS							OSMF GRADING
		SERUM CHOLESTROL	SERUM TRIGLYCERIDES	HDLC	LDLC	VLDLC	LDLC/HDLC RATIO	SERUM CHOLESTROL/HDL RATIO	
1	PATIENT 1 33/F	163	174	44.3	83.9	34.8	1.9	3.6	GRADE2
2	PATIENT 2 40/M	150	175	41.3	82.7	26	2	3.6	GRADE2
3	PATIENT 3 44/F	166	109	43.1	101.1	21.8	2.3	3.8	GRADE1
4	PATIENT 4 52/M	180	153	41.2	83.8	28	2	4.3	GRADE2
5	PATIENT 5 34/M	183	170	40.5	92.9	36.6	2.3	4.5	GRADE1
6	PATIENT 6 41/M	222	160.3	64.3	126.34	32.06	1.9	3.45	GRADE 2
7	PATIENT 7 38/M	164	149	64	70.5	29.8	1.1	2.56	GRADE3
8	PATIENT 8 46/M	121	128.5	46.3	49.3	25.7	1.06	2.6	GRADE 3
9	PATIENT 9 48/M	129.3	161.0	38.1	59	32.2	1.5	3.3	GRADE3
10	PATIENT 10 50/M	165	262.1	43.8	68.78	52.42	1.57	3.7	GRADE3

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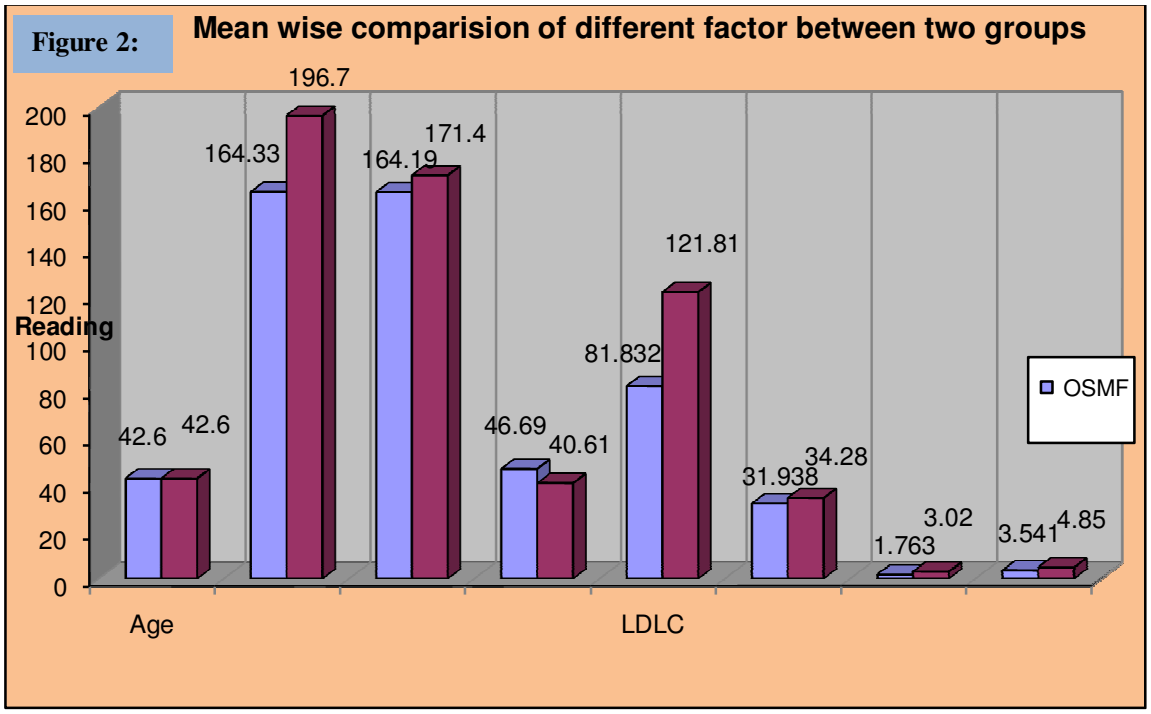
Table 2:

SR NO	AGE/SEX	LIPID PROFILE IN CONTROL PATIENTS						
		SERUM CHOLESTROL	SERUM TRIGLYCERIDES	HDLC	LDLC	VLDLC	LDLC/ HDLC RATIO	SERUM CHOLESTROL/HDL RATIO
1	PATIENT 1 32/M	193	113	42	128.4	22.6	3.1	4.6
2	PATIENT 2 34/F	200	149	43	127.2	29.8	3	4.7
3	PATIENT 3 48/F	205	199	39.6	125.6	39.8	3.2	5.2
4	PATIENT 4 44/F	201	183	40.1	124.3	36.6	3.1	5
5	PATIENT 5 47/M	200	199	37.6	122.6	39.8	3.3	5.3
6	PATIENT 6 51/M	193	222	39.4	109.2	44.4	2.8	4.9
7	PATIENT 7 39/F	202	201	38.5	123.3	40.2	3.2	5.2
8	PATIENT 8 45/M	200	150	44.2	125.8	30	2.8	4.5
9	PATIENT 9 49/M	193	119	42.6	126.6	23.8	3	4.5
10	PATIENT 10 37/M	180	179	39.1	105.1	35.8	2.7	4.6

Results were subjected to statistical analysis.

Table 3:

Group	Age (yrs)	Serum Cholesterol	Serum triglycerides	HDLC	LDLC	VLDLC	LDLC/HDL Ratio	S.Cholesterol/Hdl Ratio
OSMF	42.6	164.33	164.19	46.69	81.832	31.938	1.763	3.541
Control	42.6	196.7	171.4	40.61	121.81	34.28	3.02	4.85



The LDL cholesterol was significantly lower in osmf patients along with VLDL and LDL/HDL ratio.(Table 3 & Fig 2)

DISCUSSION

The relation of lipid levels in serum and coronary disease is well established. Rose *et al* [7] reported an inverse association between blood cholesterol level and the risk of cancer and provided a base for further epidemiological research. Since then, conflicting hypotheses have been put forward by many workers. Several authors propose that hypercholesterolemia is a predisposing factor for cancer development.[8] There are three main competing hypotheses to explain the inverse association between cholesterol concentrations and the incidence of cancer. Firstly, lower cholesterol values, even before the manifestation or detection of cancer, may be a result of the cancer process. Secondly, lower cholesterol values may precede the development of cancer but the association with cancer is secondary, i.e. cholesterol serves as a marker for some other causal set of variables. Thirdly, lower cholesterol values may precede the development of cancer and may be causally associated with the occurrence of some forms of cancer[9]

The different lipoproteins contain apolipo-proteins, which serve as ligands for specific receptors on cell membranes. Cellular uptake and regulation of cholesterol is mediated by these receptors located on the cell surface. In plasma, triglycerides and cholesterol are packaged into lipoproteins. These lipoproteins are then taken up and degraded by the cells which are needed for functioning of cells. It is believed that levels of lipids vary with malignancy. Lipids are being utilised in maintaining the integrity of cells in the malignant tissue.

Hypolipidemia often goes unnoticed and often physicians are unaware of the causes and consequences of hypolipidemia. Lower levels of lipids have been reported to be associated with septicaemia, in critically ill patients4 and at times with the existing malignancy. It may not play a role

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in carcinogenesis but a lower level of lipids may indicate rapidly dividing cells in malignancy. This can serve as a marker in early neoplastic changes, in follow up cases and as a prognostic indicator of disease.[10]

A comparative study was carried out by Patel et al. to evaluate levels of plasma lipids in head and neck cancer patients, in patients with precancerous condition and in healthy individuals. They found a significant decrease in plasma total cholesterol and HDL levels in cancer patients as well as in patients with precancerous condition as compared to the control group in accordance to our study.[11] Chawda et al have also found an inverse relationship in lipid levels and occurrence of cancer and found it to be a useful indicator. In another study by Lohe et al levels of cholesterol were evaluated in patients with precancer and cancer.[12] A significant decrease in Total Cholesterol (TC), HDL, VLDL and triglycerides was noted in patients with cancer. A significant decrease was noted in TC and HDL in patients with oral precancer when compared to control leading to a conclusion of inverse relationship between serum lipid profile and oral cancer and oral precancer which is a significant finding with our study also.

Raste et al. evaluated lipid profile in patients with carcinoma of breast, cervix, oesophagus, colon, stomach and leukaemia and concluded that serum total lipids, cholesterol & HDL cholesterol levels were significantly inversely associated with incidence of cancer, whereas triglyceride levels significantly elevated in cancer patients [13].Plasma total cholesterol, LDLC, triglycerides were elevated in breast cancer patients which was not in accordance with our study. Schatzkin et al. have noted an inverse association between cholesterol and all cancer.10 Decreased levels of triglycerides & HDL were observed in most of the gynaecologic cancer.[14]

CONCLUSION

To conclude, it appears that the lower serum lipid status may be considered as a useful indicator for initial changes occurring in the neoplastic cells As early detection is also called secondary prevention, the programs for cancer control are based on the premise that the earlier cancer is diagnosed, the better the outcomes in terms of increased survival and reduced mortality.Evaluations of biochemical changes like lipid levels1, malondialdehyde levels2 and others may serve as a valuable indicator to predict an early neoplastic change taking place.

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