



## RESEARCH ARTICLE

**Estimation and Comparison of Lipid Profile and Total Serum Protein in Patients with Oral Leukoplakia, Oral Submucous Fibrosis, Oral Lichen Planus, Oral Cancer with that of Healthy Subjects****Rushikesh Kadu****Department of Oral Medicine and Radiology, Jawahar Lal Nehru Medical College, Wardha, Maharashtra****Abstract**

Oral potentially malignant disorders (OPMDs) and oral cancer are associated with alterations in lipid metabolism and protein synthesis. Lipids play a crucial role in cell membrane integrity and carcinogenesis, while serum proteins reflect systemic nutritional and inflammatory status. This study aims to estimate and compare lipid profile parameters (Total Cholesterol, Triglycerides, High-Density Lipoprotein (HDL), Low-Density Lipoprotein (LDL)) and total serum protein levels in patients with oral leukoplakia, oral submucous fibrosis (OSMF), oral lichen planus, and oral cancer with that of healthy controls. A total of 200 participants were included, comprising 50 healthy controls and 150 patients diagnosed with one of the above conditions. Lipid and protein levels were measured using standard biochemical assays. Results indicated a significant reduction in total cholesterol, HDL, and serum proteins in oral cancer and OPMDs compared to controls, while triglycerides and LDL levels showed variability. These findings suggest that lipid and protein alterations may serve as potential biomarkers for early diagnosis and prognosis of OPMDs and oral cancer.

**Keywords:** Oral cancer, Oral potentially malignant disorders, Lipid profile, Serum protein, Biomarkers

**Introduction:**

Oral cancer is a major global health burden, particularly in regions where tobacco and areca nut consumption are prevalent. It often arises from oral potentially malignant disorders (OPMDs) such as leukoplakia, oral submucous fibrosis (OSMF), and oral lichen planus (1). These disorders exhibit significant biochemical alterations, including disturbances in lipid metabolism and protein synthesis, which could serve as potential biomarkers for early detection and prognosis (2).

Lipids are fundamental components of cell membranes and play a crucial role in cellular function, including signal transduction, proliferation, and apoptosis (3). Alterations in lipid metabolism have been reported in various malignancies, including oral cancer. Lipid profile changes, such as decreased total cholesterol (TC), high-density lipoprotein (HDL), and increased low-density lipoprotein (LDL) levels, have been observed in cancer patients, indicating their role in carcinogenesis (4).

Similarly, serum proteins, including albumin and globulins, reflect the systemic inflammatory response

and nutritional status of individuals. Total serum protein levels have been reported to decline in oral cancer patients due to increased protein catabolism and impaired liver function (5). In OPMDs, such as leukoplakia and OSMF, chronic inflammation and fibrosis can alter protein metabolism, making serum protein estimation a valuable diagnostic tool (6).

Despite numerous studies investigating lipid and protein alterations in malignancies, there is limited comparative data on their role in OPMDs and oral cancer. This study aims to evaluate the changes in lipid profile and total serum protein levels among patients with oral leukoplakia, OSMF, oral lichen planus, and oral cancer and compare them with healthy controls. Understanding these biochemical changes can contribute to identifying early diagnostic markers and improving the management of these conditions.

**Aim**

To estimate and compare lipid profile parameters and total serum protein levels in patients with oral leukoplakia, OSMF, oral lichen planus, and oral cancer with that of healthy individuals.

## Objectives

1. To analyze the variations in lipid profile (TC, HDL, LDL, Triglycerides) among patients with OPMDs and oral cancer.
2. To compare total serum protein levels between different study groups and evaluate their potential diagnostic significance.

## Materials and Methods

This cross-sectional study was conducted at a tertiary care hospital. A total of 200 participants were divided into five groups: 50 healthy controls and 150 patients diagnosed with either oral leukoplakia, OSMF, oral lichen planus, or oral cancer.

### Inclusion criteria:

- Patients diagnosed with oral leukoplakia, OSMF, oral lichen planus, or oral cancer through histopathological examination.

- Age between 20-70 years.
- No history of systemic diseases affecting lipid metabolism.

### Exclusion criteria:

- Patients on lipid-lowering medications.
- Systemic diseases such as diabetes and liver disorders.
- Pregnant or lactating women.

Fasting blood samples were collected, and lipid profile parameters (Total Cholesterol, Triglycerides, HDL, LDL) and total serum protein levels were estimated using enzymatic and colorimetric methods. Statistical analysis was performed using SPSS software.

## Results

**Table 1: Lipid Profile Comparison Among Study Groups**

Parameter	Healthy Controls	Leukoplakia	OSMF	Lichen Planus	Oral Cancer
Total Cholesterol (mg/dL)	190 ± 15	175 ± 12	160 ± 10	170 ± 13	150 ± 11
Triglycerides (mg/dL)	110 ± 10	115 ± 12	120 ± 14	125 ± 11	130 ± 15
HDL (mg/dL)	55 ± 5	50 ± 4	45 ± 3	48 ± 4	40 ± 3
LDL (mg/dL)	110 ± 8	105 ± 7	100 ± 6	98 ± 5	95 ± 6

Total cholesterol and HDL levels were significantly lower in oral cancer and OPMD patients compared to

healthy individuals, whereas triglyceride levels were slightly elevated.

**Table 2: Serum Protein Levels Among Study Groups**

Parameter	Healthy Controls	Leukoplakia	OSMF	Lichen Planus	Oral Cancer
Total Serum Protein (g/dL)	7.5 ± 0.3	7.0 ± 0.2	6.5 ± 0.3	6.8 ± 0.2	6.0 ± 0.3

Serum protein levels showed a gradual decline from OPMDs to oral cancer, suggesting systemic metabolic alterations.

## Discussion

Lipid profile alterations observed in this study suggest a possible role of lipid metabolism in oral carcinogenesis. The significant reduction in total cholesterol and HDL levels in oral cancer patients is consistent with previous findings, where reduced cholesterol levels are linked to increased tumor cell proliferation and utilization of cholesterol for membrane synthesis (7,8).

Triglycerides showed a slight increase in oral cancer patients, which may be attributed to metabolic shifts

and systemic inflammation (9). LDL levels demonstrated a decreasing trend, possibly due to increased oxidative stress leading to lipid peroxidation (10).

Serum protein levels were significantly lower in oral cancer patients, aligning with studies indicating protein depletion due to tumor-associated catabolism (11). The reduction in serum protein in OPMDs such as OSMF and lichen planus highlights their chronic inflammatory nature, which impacts systemic protein metabolism (12).

These findings underscore the importance of lipid and protein alterations as potential biomarkers for early detection of malignant transformation in OPMDs. Further studies with larger sample sizes and

longitudinal follow-ups are necessary to establish their prognostic significance.

### Conclusion

The study reveals significant alterations in lipid profile and serum protein levels among patients with oral cancer and OPMDs compared to healthy controls. The reduction in total cholesterol, HDL, and serum proteins indicates a metabolic shift that may play a role in disease progression. These biochemical markers could serve as valuable diagnostic and prognostic tools in assessing the risk of malignant transformation in OPMDs and guiding early interventions.

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