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# To study lipid profile status in chronic obstructive pulmonary disease patients

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**Abstract**

**Background:** Chronic obstructive pulmonary disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory abnormalities usually caused by significant exposure to noxious particles or gases.

**Methods:** This cross-sectional study was conducted on 30 COPD patients and including 30 control were enrolled in the study.

**Results:** The lipid profile in COPD patients, unpaired t test was performed and it was observed that COPD patients showed significantly higher serum levels of TC, TG, LDL and serum concentrations of HDL were also decreased significantly compared to controls.

**Conclusion:** COPD patients showed significantly higher serum levels of TC, TG, LDL and serum concentrations of HDL were also decreased significantly compared to controls.

**Keywords:** lipid profile, chronic obstructive pulmonary disease, patients

## Introduction

Chronic obstructive pulmonary disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/ or alveolar abnormalities usually caused by significant exposure to noxious particles or gases [1]. Exacerbation and co-morbidities contribute to the overall morbidity and mortality in individual patient.

Chronic obstructive pulmonary disease (COPD) is a multisystem condition defined as "a preventable and treatable disease with some significant extra-pulmonary effects that may contribute to the severity in individual patients." Its pulmonary component is characterized by airflow obstruction that is usually progressive and not fully reversible. In the western world, COPD is typically caused by long-term exposure to tobacco smoke [2].

According to the statistics, chronic obstructive pulmonary disease (COPD) accounts for almost three million (5%) deceases worldwide in 2015. This disease is likely to increase in the coming years due to the growing prevalence of smoking and population aging in many countries. Metabolic syndrome which includes central obesity, diabetes, hypertension, and hyperlipidaemia, is known entity in COPD patients. Metabolic syndrome was associated with markers of systemic inflammation like Interleukin-6, C reactive protein, and fibrinogen etc [3]. There are limited number of studies investigating dyslipidemia in the COPD patients.

These studies have generally relied on questionnaires or diagnostic codes to determine the frequency of dyslipidemia in the patients with COPD, and it is unknown if dyslipidemia is another independent factor that could explain the increased risk of cardiovascular morbidity and mortality in the COPD patients [4]. The COPD patients are expected to have a deranged lipid profile for various reasons like smoking, aging, and using such drugs as steroids.

## Materials and Methods

This cross-sectional study was conducted on the inpatients and outpatients attending the Department of Respiratory Medicine, Shri Aurobindo Institute of Medical Science and PG Institute Indore (Madhya Pradesh) . Therefore, a total of 30 COPD patients and including 30 control were enrolled in the study.

### The exclusion criteria included

1. Uncooperativeness and unwillingness to participate in the study,
2. Being seriously ill,
3. Known case of carcinoma, bronchial asthma, active tuberculosis, diabetes, hypertension, collagen vascular disease,
4. Inability to properly perform spirometry,
5. The presence of congenital or valvular cardiomyopathy or other familial hyperlipidemias. After the informed consent was obtained from all the participants. Subsequently, the COPD patients were segregated and diagnosed based on the GOLD guidelines with such risk factors as dyspnea, chronic cough, chronic sputum production, history of exposure to the respective risk factors, and age of > 40 years. A detailed history was obtained from all the patients; furthermore, clinical examination and radiological tests were performed to confirm the presence of COPD and the associated cardiovascular complications.

After a 12-hour overnight fast, 5 ml fasting blood samples were collected from all the participants in the morning. The total cholesterol, HDL, and triglycerides were directly analyzed using the standard enzymatic techniques.

## Results

Mean age in COPD patients was 37.20±12.10 years and control patients was 36.30±11.30 years. Both groups were well matched for age and sex distribution.

**Table 1:** Comparision of biochemical parameters in case and controls.

| Parameters | Case (n=30) | Control (n=30) | p-value |
|---|---|---|---|
| Mean Total cholesterol | 182.60 ± 18.40 | 171.20± 14.40 | <0.05 |
| Mean LDL | 116.20 ± 11.40 | 108.50± 11.20 | <0.05 |
| Mean HDL | 34.20 ± 3.90 | 36.30± 4.80 | <0.05 |
| Mean Triglycerides | 142.90± 11.60 | 132.50 ± 10.50 | <0.05 |

The lipid profile in COPD patients, unpaired t test was performed and it was observed that COPD patients showed significantly higher serum levels of TC, TG, LDL and serum concentrations of HDL were also decreased significantly compared to controls.

## Discussion

COPD is associated with significantly increased morbidity and mortality and COPD precipitates dyslipidemia. So present was conducted and found that COPD patients showed significantly higher serum levels of TC, TG, LDL and serum concentrations of HDL were decreased significantly. This finding was collaborated with the results of some previous studies [4, 5].

Although Kamat SR, *et al*. In their study has shown the serum of lipid parameters are not different in COPD from healthy controls [6]. Smoking can cause major changes in serum lipid profile simultaneously smoking is a major risk factor in COPD. Smoking affects the lipid profile such a way that the plasma LDL, cholesterol and triglycerides concentration are higher and HDL cholesterol is lower in smoker than in nonsmokers [7].

Nicotine causes the release of adrenaline from the adrenal cortex leading to increased serum concentration of free fatty acids (FFA) which stimulates hepatic synthesis and secretion of cholesterol as well as hepatic secretion of VLDL and hence increased TG. Smoking decreases estrogen levels and further leads to decreased HDL cholesterol concentration. Smoking also increases insulin resistance and LDL, VLDL and TG are elevated in this hyperinsulinemic conditions due to decreased activity of lipoprotein lipase [8].

## Conclusion

COPD patients showed significantly higher serum levels of TC, TG, LDL and serum concentrations of HDL were also decreased significantly compared to controls.

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