



## Comparative study of effect of lipid profile in smokers and non smokers of age group of 40-50 years

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### Abstract:

**Background:** Cigarette smoking is generally considered as associated with increased risk of a variety of medical disorders. **Aims and objectives:** The study was aimed to estimate the lipid profile in smokers and non smokers and to establish a relation between cigarette smoking and lipid profile. **Material and Methods:** Lipid profile was estimated in a total of hundred cases of smokers aged between 40-50 years who smoked for more than 5 years of duration and hundred individuals who are non smokers. **Results:** The mean  $\pm$ S.D. of serum total cholesterol was  $231.11 \pm 25.95$  mg/dL, the mean  $\pm$ S.D. of serum Triglyceride is  $215.39 \pm 52.01$  mg/dL, the mean  $\pm$ S.D. of serum LDL-cholesterol was  $143.41 \pm 26.28$  mg/dL, the mean  $\pm$ S.D. of serum VLDL-cholesterol were higher in smokers as compared to the values in non smokers. The mean  $\pm$ S.D. of serum of HDL-cholesterol levels in smokers was  $36.71 \pm 4.36$  mg/dL which was lower compared to levels in control group. The TC/HDL and LDL/HDL ratios were significantly higher in smokers as compared to that of controls. **Conclusion:** To conclude smoking causes alteration in lipid profile. This study clearly shows a strong relationship between elevation of serum lipids and cigarette smoking.

**Key words:** HDL;LDL;VLDL;Total cholesterol

### Introduction:

Cigarette smoking is generally considered as associated with increased risk of a variety of medical disorders. Several studies provide the evidence that tobacco is strongly associated with altering the normal status of the lipid profile [1-3]. Smoking in different forms is a major risk factor for atherosclerosis and coronary heart disease [4,5].

There is a dose response relationship between the number of cigarettes / bidis smoked and cardiovascular morbidity and mortality [6,7]. Cigarette smoking is believed to cause harmful cardiovascular and atherogenic effects resulting from changes in lipid metabolism [8].

**Materials and Methods**

A total of hundred cases of smokers attending out-patient department of General Medicine of Navodaya Medical College Hospital and Research Centre, Raichur during period between May 2010 to February 2012.

The cases were selected based on the following criteria

1. Inclusion criteria

- Healthy Individuals with age group of 40-50 years
- History of smoking more than 5 years duration (chronic smokers)
- No History of Diabetes
- No History of Hypertension.
- No History of Alcohol abuse.
- No History of any CNS Disorders
- No History of any other systemic diseases.

2. Exclusion Criteria

- History of Diabetes
- History of Hypertension.
- History of Renal disease
- History of Liver disease

Hundred individuals without any history of smoking were included as control.

These entire subjects venous blood sample was collected in fasting state (overnight 12 hours fasting). Precautions were taken so that the blood did not haemolyze. The blood samples were allowed to stand to form clot. Serum was then separated and analyzed for lipid profile.

**Statistical analysis**

The quantitative data was analyzed with student ‘t’ test and ANOVA with SPSS package of version 16. ‘P’ value of <0.05 has taken as statistically significant.

**Results**

The results of total cholesterol in controls and smokers are shown in Table-3 showing mean value, standard deviation (SD) and standard error of the mean.

**Table 1: TOTAL CHOLESTEROL(mg/dl):**

	Controls	Smokers
Mean	164.7600	231.1100
S.D.	13.45109	25.95875
S.E.M.	1.34511	2.59587

Controls vs Smokers : P<0.001

The levels of serum total cholesterol were higher in smokers.

**Table 2: Triglyceride (mg/dl)**

	Controls	Smokers
Mean	136.6900	215.3900
S. D.	20.75041	52.01785
S.E.M.	2.07504	5.20178

Controls vs Smokers : P<0.001

Triglycerides levels were increased in smokers.

**Table 3: H.D.L (mg/dl)**

	Controls	Smokers
Mean	42.5000	36.7100
S.D.	5.59672	4.36768
S.E.M.	0.55967	0.43677

Controls vs Smokers : P<0.001

HDL levels were lower in smokers as compared to controls.

**Table 4: L.D.L (mg/dl)**

	Controls	Smokers
Mean	95.0620	143.4120
S.D.	17.39190	26.28358
S.E.M.	1.73919	2.62836

Controls vs Smokers : P<0.001

LDL cholesterol levels were higher in smokers.

**Table 5 :V.L.D.L (mg/dl)**

	Controls	Smokers
Mean	27.1380	42.7700
S.D.	4.25763	10.34978
S.E.M.	.42576	1.03498

Controls vs Smokers : P<0.001

VLDL levels were higher in smokers as compared to controls.

**Table 6: TC/ HDL**

	Controls	Smokers
Mean	3.9260	6.3372
S.D.	0.58493	1.06156
S.E.M.	0.05849	0.10616

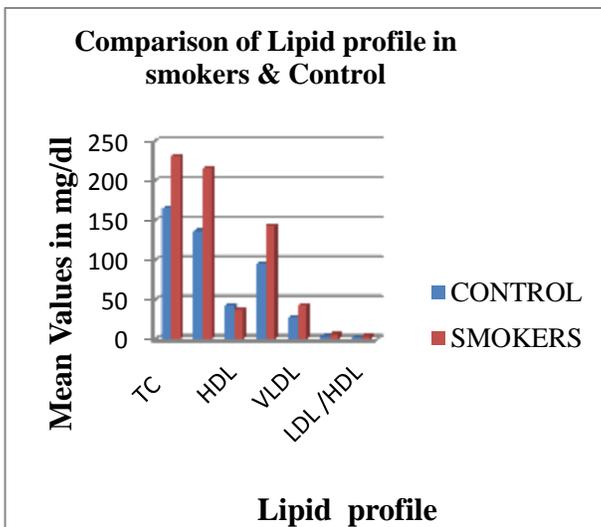
Controls vs Smokers : P<0.001

**Table 7: LDL/HDL**

	Controls	Smokers
Mean	2.2720	3.9389
S.D.	0.54236	0.85671
S.E.M.	0.05424	0.08567

Controls vs Smokers : P<0.001

The TC/HDL and LDL/HDL were increased in smokers.



**Figure 1: Comparison of lipid profile in smokers and control**

### Discussion:

We studied 100 normal non smokers healthy individuals men between 40-50 years. The criteria for chronic smokers was taken as those men who smoked for more than 5 years of duration. Studies have shown that cigarette smoking increases serum total cholesterol, triglycerides, LDL cholesterol, VLDL cholesterol, and decreases serum HDL levels. In the present study the following observations were made.

#### Total cholesterol levels:

The mean  $\pm$  S.D. of serum total cholesterol in study group was  $231.11 \pm 25.95$ mg/dL, where as in control group it was  $164.76 \pm 13.45$ mg/dL. There was significant increase in serum total cholesterol levels in smokers as compared to non smokers ( $P < 0.001$ ). Similar findings were found in the studies done by Sinha et al [9] and Venkateshan et al. Rastogi et al [10,11] also showed that there is an increased levels of serum total cholesterol in smokers.

#### Serum triglyceride levels:

The mean  $\pm$  S.D. of serum triglyceride was  $215.11 \pm 52.01$ mg/dL in smokers and  $136.69 \pm 20.75$ mg/dL in non smokers ( $P < 0.001$ ). Similar finding was observed by Sinha A.K et al where mean serum triglycerides ( $176.8 \pm 59.7$ mg/dL) was significantly higher in smokers than in non smokers ( $P < 0.001$ ).

#### Serum HDL-cholesterol levels:

In this study the mean  $\pm$  S.D. of serum HDL cholesterol levels in smokers was  $36.71 \pm 4.36$ mg/dL where as in non smokers it was  $42.50 \pm 5.59$  mg/dL ( $P < 0.001$ ). This finding is similar to the study done

by Sinha A.K. et al who found that mean HDL cholesterol was ( $4.32 \pm 5.8$ mg/dL) was significantly lower ( $P < 0.05$ ).

#### Serum LDL cholesterol levels:

The mean  $\pm$  S.D. of serum LDL was  $143.41 \pm 26.28$ mg/dL in smokers where as in non smokers it was  $95.06 \pm 17.39$  mg/Dl ( $P < 0.001$ ) which was similar to the finding of Sinha A.K et al who found it to be higher in smokers ( $100.2 \pm 31.0$ mg/dl) ( $P < 0.001$ ).

#### Serum VLDL cholesterol levels:

Serum VLDL cholesterol was also raised. The mean  $\pm$  S.D. was  $42.7700 \pm 10.34978$  as compared to controls ( $P < 0.001$ ).

TC/HDL and LDL/HDL ratios were significantly higher in smokers as compared to that of controls. These ratios are useful as quick summary of disease risk in smokers. TC/HDL ratio estimates the net effect of two way traffic of cholesterol in and out of tissues [12]. This ratio has been suggested to be the most important predictor of premature development of coronary heart disease [13].

### Conclusion:

To conclude smoking causes alteration in lipid profile. Our study clearly shows a strong relationship between elevation of serum lipids and cigarette smoking. The risk of increase in serum cholesterol with an increase in LDL-cholesterol and decrease in HDL-cholesterol assume a great significance since this has been the pattern associated with coronary artery disease.

The exposure of vascular endothelium to atherogenic lipoproteins as a consequence of impaired clearance of triglyceride rich lipoproteins and the low levels of HDL-cholesterol in cigarette smokers may provide a mechanism where by smoking increases the risk of developing atherosclerotic plaques and coronary artery disease.

Cessation of smoking not only reverses lipid changes but also vascular diseases especially coronary artery disease. Passive smokers are prone to get the same abnormality as demonstrated in literature. It is the need of the hour to understand intense educational programmes regarding the adverse effects of smoking and also amend law to prohibit smoking in public places to curb the health hazards of smoking.

#### Limitation of this study:

This study was undertaken involving only males of specific age group belonging to the same geographical area.

**Summary:**

1. This study was carried out to assess the impact of active tobacco smoking on lipids profile function tests of adult male population.

2. A total of hundred cases of smokers and hundred controls were studied.

3. The mean  $\pm$  S.D of serum total cholesterol was  $231.11 \pm 25.95$  mg/dL, the mean  $\pm$  S.D of serum Triglyceride is  $215.39 \pm 52.01$  mg/dL, , the mean  $\pm$  S.D of serum LDL was  $141.41 \pm 26.28$  mg/dL, the serum VLDL cholesterol levels were higher in smokers as compared to the values in control group. The mean  $\pm$  S.D of serum HDL cholesterol levels in smokers was  $36.71 \pm 4.36$  mg/dL which was lower compared to the levels in control group. The TC/HDL and LDL/HDL ratios were significantly higher in smokers as compared to that of control. The observed values were statistically significant ( $P < 0.001$ ) when compared to non smokers.

4. Our study clearly shows a strong relationship between elevation of serum lipids and cigarette smoking.

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