



A COMPARATIVE STUDY ON LIPID PROFILE AMONG YOUNG SMOKERS AND NON SMOKERS

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ABSTRACT

Background and objective: The present study provides a detailed profile of the plasma lipid and lipoprotein levels according to cigarette smoking status (smoker, ex-smoker and non-smoker) and dosage [number of cigarette(s) smoked per day] in this part of ANDHRAPRADESH.

Methodology: The study is being carried out in 100 healthy male smokers and 100 healthy male non smokers selected from volunteers from general public, patient attendants and hospital staff of ASRAM HOSPITAL, ELURU

Results: Out of 100 patients in the present study the number of subjects in mild, moderate and high smokers group were 42 (42%), 44 (44%), 14 (14%) respectively. Smokers had higher total cholesterol, plasma triglycerides, serum LDL, serum VLDL and lower levels of serum HDL compared to non-smokers which was statistically significant.

Conclusion: The present study provides a detailed profile of the plasma lipid and lipoprotein level according to cigarette/ beedis smoking status (smoker, ex-smoker and non-smoker) and dosage (number of cigarettes/ beedis smoked per day). Cigarette / beedi smoking is associated with significant lower levels of serum HDL and high levels of serum cholesterol, serum triglycerides, serum LDL levels.

KEYWORDS : Cigarette / Beedi smoking , Total cholesterol, Plasma triglycerides, Serum LDL, Serum VLDL

INTRODUCTION

Tobacco is a serious threat to health and a proven killer and ranks second as a cause of death in the world, taking its toll by killing some 5 million people globally.

WHO estimates that unless current smoking pattern is reversed, tobacco will be responsible for 10 million deaths per year, by the decade 2020–2030, with 70% of them occurring in developing countries¹

Deaths attributable to tobacco are expected to rise from 1.4% of all deaths in 1990 to 13.3% in 2020. India, as per WHO projection, will have the highest rate of rise in tobacco-related deaths during this period compared to all other countries/regions². In subject more than one of these risk factors the risk is more than additive³.

Although smoking has been established as an independent risk factor for coronary heart disease, the mechanism by which it increases the risk of coronary heart disease are unclear. Several explanations have been postulated⁴.

However, studies to date have revealed incomplete, inconclusive or conflicting results about the association of smoking on the plasma lipid and lipoprotein levels. In some studies, smokers had increased plasma cholesterol levels, in others plasma cholesterol level have actually been lower⁵. Only a few studies have specifically examined the plasma lipoprotein according to smoking status or no. of cigarettes (dosage)⁶. Smokers are reported to have higher LDL and lower HDL cholesterol levels than non-smokers⁷.

There is inadequate data on the association of smoking and dyslipidemia in India.

AIMS AND OBJECTIVES

The present study is done to:

1. Compare lipid profile values of smokers with non smokers.
2. To know if smoking has dyslipidemic potential in young.
3. To study the effect smoking on lipid profile.
4. To study the effect of severity and duration of smoking on lipid profile.

METHODOLOGY

Methods of collection of data:

The study is being carried out in 100 healthy male smokers and 100 healthy male non smokers selected from volunteers from general public, patient attendants and hospital staff ASRAM, ELURU.

After obtaining written consent, detailed history and physical examination was done in all subjects.

Inclusion criteria for smokers and non-smokers:

1. The subjects were divided into 4 groups
 - a) Non- smokers : subjects who have never smoked or those who left smoking atleast 5 yrs before in the present study
 - b) Mild smokers: 1-10 cigarettes or 1-15 beedis / day for atleast 5 yrs or more
 - c) Moderate smokers: 11-20 cigarettes or 16- 30 beedis / day for atleast 5 yrs or more.
 - d) Heavy smokers: more than 20 cigarettes or 30 beedis / day for atleast 5 yrs or more.
2. The subject's were chosen in age groups of 18 - 40 yrs of age
3. The subject's BMI were less than 28
4. The subjects were taking average Indian diet.

Exclusion criteria for smokers and non- smokers:

1. Subjects having diseases mentioned below known to influence blood lipids were excluded from the study
 - Diabetes mellitus, Nephrotic syndrome, Alcoholism, Hypertension
2. Subjects who were on following drugs:

- HMG CoA reductase inhibitors, Fibric acid derivatives, Nicotinic acid, Beta blockers, Diuretics

3. Subjects who were on diet restriction

The parameters used for comparison were:

- Age, Sex, Body mass index (BMI)

After overnight fasting following laboratory investigations were done in all subjects:

- Serum total cholesterol
- Serum high density lipoprotein (HDL)
- Serum low density lipoprotein (LDL)
- Serum very low density lipoprotein (VLDL)
- Serum triglyceride (TGL)
- Fasting blood sugar (FBS)
- Serum Creatinine
- Urine for albumin, sugar and microscopic examination

The statistical tests used in the study are:

1. Z test
2. χ^2 test (chi square test)
3. Mean
4. Standard deviation
5. Diagrammatic presentation.

RESULTS

- The mean value of HDL was higher in non smokers (45.82 ± 7.65) when compared to that of smokers (31.56 ± 5.91) and were statistically significant ($p < 0.05$).
- The mean values of TGL was higher in smokers (129.76 ± 38.62) when compared to non smokers (101.84 ± 24.23) and were statistically significant ($p < 0.05$).
- Total cholesterol value was highest in heavy smokers (214.71), less in moderate smokers (187.79) and least in mild smokers (149.85). The difference of these values with non-smokers was statistically significant.
- The triglyceride levels were highest in heavy smokers (167.92), less in moderate smokers (129.04) and least in mild smokers (117.78). The difference of these values with non-smokers was statistically significant.
- The serum LDL level were highest in heavy smokers (155.91), less in moderate smokers (131.39) and least in least in mild smokers (91.60). the difference of these values with non-smoker was statistically significant.
- The serum VLDL level was highest in heavy smokers (33.58), less in moderate smokers (25.80) and least in mild smokers (23.55). The difference of these values with non-smokers was statistically significant.
- The serum HDL level was lowest in heavy smoker group (25.21), higher in moderate smoker group (30.59) and highest in mild smoker group (34.69). The difference of these values compared to non-smoker group was statistically significant.

DISCUSSION

Several studies have shown an association between cigarette smoking and altered serum lipid and lipoprotein concentrations, but many of these have lacked enough statistical power to establish a firm association^{8,9,10}. By combining the results of individual studies in the present analysis we have shown conclusively that smoking is associated with significantly higher serum concentrations of total cholesterol, triglycerides, very low density lipoprotein cholesterol, and low density lipoprotein cholesterol and lower serum concentrations of high density lipoprotein cholesterol and apolipoprotein AI and that this association is dose dependent. To our knowledge the data relevant to changes in serum lipid and

lipoprotein concentrations associated with degree of exposure to cigarette smoke have not previously been compiled and reviewed. The dose dependent relation that we found may provide new evidence for a causal relation.

In NS Neki et al serum total cholesterol, LDL and VLDL levels were significantly higher ($p < 0.05$) when compared to non smokers. The The mean HDL levels were higher in non smokers than smokers and this difference was statistically highly significant ($p < 0.01$).¹¹

In OA Odedeji et al serum total cholesterol was significantly higher ($p < 0.05$) when compared to non smokers. The mean LDL levels were higher in smokers than non smokers and this difference was statistically significant ($p < 0.05$). The mean VLDL difference between smokers and non smokers was not statistically significant ($p > 0.05$). The mean HDL levels were higher in non smokers than smokers and this difference was statistically highly significant ($p < 0.01$).¹²

In Mokoto et al. The mean triglycerides levels difference between smokers and non smokers was statistically significant ($p < 0.05$). The mean total cholesterol levels difference between smokers and non smokers was not statistically significant ($p > 0.05$). The mean VLDL difference between smokers and non smokers was not statistically significant ($p > 0.05$). The mean LDL difference between smokers and non smokers was not statistically significant ($p > 0.05$). The mean HDL levels were higher in non smokers than smokers and this difference was statistically significant ($p < 0.05$).¹³

In Aneela et al the mean serum total cholesterol in smokers when compared to non smokers, which was statistically significant ($p < 0.05$). The mean serum triglycerides were higher in smokers when compared to non smokers, which was statistically significant ($p < 0.05$). The mean serum VLDL was higher in smokers when compared to non smokers, which was statistically significant ($p < 0.05$). The mean serum LDL were higher in smokers when compared to non smokers, which was statistically significant ($p < 0.05$). The mean serum HDL was higher in non smokers when compared to smokers, which was statistically significant ($p < 0.05$).¹⁴

There is inverse relationship between smoking and serum HDL level. Also this inverse relationship is dose dependent i.e. it is dependent on number of cigarettes /beedis smoked per day as in the present study. Imamura et al found that serum HDL was lowest among heavy smoker group compared to moderate smokers in present study (30.59), in Imamura et al (55.5), and mild smoker which was statistically significant ($p < 0.05$).

CONCLUSION

It is revealed that triglycerides, LDL, VLDL, HDL, and TC were statistically significantly higher in smokers as compared to non smokers. The mean serum total cholesterol was higher in smokers when compared to non smokers, which was statistically significant ($p < 0.05$). The mean serum triglycerides was higher in smokers when compared to non smokers, which was statistically significant ($p < 0.05$). The mean serum VLDL was higher in smokers when compared to non smokers, which was statistically significant ($p < 0.05$). The mean serum LDL was higher in smokers when compared to non smokers, which was statistically significant ($p < 0.05$). The mean serum HDL was higher in non smokers when compared to smokers, which was statistically significant ($p < 0.05$). As serum HDL is a protective risk factor against coronary heart disease, this greater risk to smokers of coronary heart disease development may result from this HDL lowering effect of smoking.

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