

## Plasma Lipid Profiles In Chronic Tobacco Smokers and Hypertensives

Srinivasa Rao.Chandala<sup>1</sup> and Srinivas Reddy.Kilim<sup>2</sup>

<sup>1</sup> Associate Professor Department of Physiology, Siddhartha Medical College,  
Gunadala, Vijayawada-520 008, Andhrapradesh . India

<sup>2</sup> Associate Professor department of physiology, Rangaraya medical college ,  
Kakinada PIN-533003 ,Andhrapradesh.. India

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**Abstract:** A Worldwide epidemic of cardio vascular diseases are evolving out of which atherosclerosis appears to be the most frequent underlying cause. . Hyperlipidaemia, which is associated with hypertension and smoking have been recognised as independent risk factor for cardiovascular disease and cause of death .The association between hypertension and dyslipidaemia is well established and both may add up to increase patients' susceptibility to the development of coronary heart disease. Different plasma lipid Although a genetic predisposition to atherosclerosis may be the cause but the vast majority of atherosclerotic related diseases including coronary Heart diseases are acquired and which usually associated with hypertension and smoking. Hypertension, the simply treatable risk factor of stroke and myocardial infarction. Cigarette smoking remain the most important cause of preventable morbidity and early mortality.

**Methods:** This study was conducted on three groups of male subjects each group containing 50 individuals of 45 to 50 years of age weighing 50 to 70 kgs. .

**Group-I:** non smokers and normotensives .

**Group: II:** Smokers and normotensives :

**Group –III:** hypertensive and non Smokers. To estimate triglycerides, Glycerol derived from saponification of triglycerides is oxidised to formaldehyde which in turn made to react with ammonia and acetylacetone to give rise to a chromogen (3,5 diacetyl-1,4 dihydrolutidine) and is quantified spectro-photometrically (the HANTZSCH reaction).

**Results:** The mean serum Total cholesterol levels in the subjects of Group II is more by about 16.94 % ( $p < 0.001$ ) and Group –III is more by 23.21% ( $p < 0.001$ ). . The mean serum VLDL levels in the subjects of Group II has an increase by about 27.54% ( $p < 0.01$ ) and Group –III is increased by 11.82% ( $p < 0.01$ ). The mean serum LDL levels in the subjects of Group II showed an increase of about 34.64% ( $p < 0.001$ ) and Group –III is increased by 16.27% ( $p < 0.001$ ). The mean serum HDL levels in the subjects of Group II showed a decrease in the mean serum HDL level by about 9.78 % ( $p < 0.01$ ) and Group –III is decreased by 22.12% ( $p < 0.01$ ) The mean serum Triglyceride levels in the subjects of Group II showed an increase in the mean serum Triglyceride level by about 25.40% ( $p < 0.001$ ) and Group –III is more by 33.35% ( $p < 0.001$ ).

**Conclusion:** there was a significant increase in total cholesterol and LDL-C in smokers and hypertensive's as compared to nonsmoker normotensives.

**Keywords:** Cigarette smoking, Blood pressure, Serum cholesterol, Cardio Vascular Disease

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### I. Materials And Methods

This study was conducted on three groups of male subjects of 45 to 50 years of age weighing 50 to 70 kgs. each group contains 50 subjects .Subjects with diabetes, ,obesity, renal diseases lipid metabolism disorders, coronary diseases were excluded.

**Group I:** non smokers and normotensives taken as control group.

**Group II:** Smokers and normotensives : These are the individuals who were smoking 11 to 20 cigarettes for the last 10 years.

**Group III:** hypertensive and non Smokers. These are the individuals who were diagnosed as hypertensives and nonsmokers.

The subjects are instructed to stay fasting overnight. Heart Rate, and blood pressure are recorded while at rest. The blood samples are collected after an overnight fasting for about 14 hours. 5 ml. of whole blood is collected and serum separated. Serum lipid profiles are done and lipid levels are calculated. The readings obtained are shown in the tables. Estimation of Total cholesterol by Zak Method<sup>(1)</sup> Estimation Of Triglycerides by HANTZSCH condensation reaction. Estimation of HDL Cholesterol

LDL, VLDL and Chylomicrons are precipitated by Polyanions in the presence of metal ions (Phosphotung-state/Mg) to leave HDL in solution. The complete lipid profile measures serum total cholesterol, HDL and triglycerides. LDL and VLDL are calculated by using Freidewald formula provided the triglyceride levels are below 400mg. per dl.

VLDL cholesterol= trigly-ceride/5

LDL cholesterol=Total cholesterol – (VLDL Cholesterol + HDL Cholesterol)

## II. Results

Mean serum Total cholesterol, VLDL, LDL, serum Triglyceride levels in the subjects of Group III and Group II showed significant increase than Group I subjects. The mean serum HDL levels in the subjects of Group III and Group II showed significant decrease than Group I subjects .

## III. Discussion

tobacco is recognized as a major risk factor for the development of ischemic heart disease and may lead to alter the normal plasma lipoprotein pattern<sup>(2)</sup>. It has long been established that tobacco contains nicotine and it has a considerable influence on increasing the level of lipids in the blood.

Batic-mujanovic O<sup>(3)</sup> et al, Neki NS<sup>(4)</sup>, krishnaswamiS, etal<sup>(5)</sup>, Stanford BA, et al<sup>(6)</sup>. observed decreased levels of HDL Cholesterol, increased levels of total cholesterol, LDL cholesterol, triglycerides in smokers in comparison with non smokers. The same observation is found in our study also.

Nnno dimjohnkennedy<sup>(7)</sup> has observed increased levels of total cholesterol, triglycerides and LDL-C which is in accordance with our study. Garrison et al<sup>(8)</sup>, Yadav BK, Bade AR, Singh J, Jha B<sup>(9)</sup>, measured the HDL cholesterol in smokers when it was noticed a Negative association between number of cigarettes consumed and HDL levels which is in concurrence with our study,

Serum total cholesterol, tryglicerides, LDL Cholesterol levels and decreased levels of HDL Cholesterol observed by Guedes DP etal<sup>(10)</sup> is in accordance with our study. Saengdith P<sup>(11)</sup> studied serum lipid levels and found increase in triglycerides is in concurrence with the present study .

Khurana M et al<sup>(12)</sup> Waheeb DM. <sup>(13)</sup>, Gosset LK, Johnson HM, Piper ME et al<sup>(14)</sup>. Demosthenes B et al<sup>(15)</sup>, compared the lipid profile of smokers and tobacco chewers and observed a rise of TG, LDL, VLDL with a decrease of HDL in smokers and chewers in concurrence with present study.

Arslan E et al<sup>(16)</sup> Loic de parscau et al<sup>(17)</sup> Campbell SC et al<sup>(18)</sup>, Svenchrenger<sup>(19)</sup> Riteshgupta<sup>(20)</sup> observed increased LDL, VLDL triglycerides and decreased HDL is consistent with the present study. Hajmouhamed D et al<sup>(21)</sup> observed decreased levels of HDL Cholesterol, increased levels of total cholesterol, LDL cholesterol, triglycerides in Tunisian smokers in comparison with non smokers. The same observation is found in our study also.

The association between hyper tension and increased levels of LDL-Cholesterol observed in this study which is in accordance with [Sarkar D](#)<sup>22</sup> et.al Increased triglyceride levels observed in hypertensive subjects in this study were also observed by Kamrun Nahar Choudhury<sup>23</sup> Charles U et .al<sup>24</sup> N Lakshmana Kumar<sup>25</sup>, MS Saha<sup>26</sup>, studied the relation between hypertension and decreased levels of HDL-cholesterol were also observed in this study

## IV. Summary

In this study it is observed that hypertensive patients are having significant increase in total cholesterol, triglycerides, LDL-C and also decrease in the HDL-C in the blood which is favorable for atherosclerosis.

Smoking or more carefully if we use it tobacco has a very bad influence on the total health system of the human being not only effecting the arteries or lung but almost affecting all the function system of the body from cell to cell.

Nicotine of tobacco causes the decrease in the HDL cholesterol (good cholesterol), with an increasing the LDL cholesterol (bad cholesterol) and also increase in the VLDL cholesterol with accumulation of lipids in the arterial wall this is responsible for greater risk of developing atherosclerosis in tobacco users than non-tobacco users.

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**Table: 1 - Comparison of Mean Serum Lipoprotein Values In Non Smokers Normotensives And Smokers Normotensives**

	SMOKERS NORMOTENSIVES		NON SMOKERS NORMOTENSIVES		P-VALUE
	MEAN	SD	MEAN	SD	
HEART RATE	78.96	1.85	70.40	2.67	<0.01
SBP	125.40	7.73	113.70	6.49	<0.01
DBP	82.80	3.05	75.60	4.16	<0.001
LDL	113.80	10.67	84.52	3.83	<0.001
TRIGLYCE RIDES	117.60	12.34	92.20	5.96	<0.001
HDL	54.92	8.14	60.88	7.89	< 0.01
VLDL	23.52	2.46	18.44	1.19	< 0.01
T.CHOLES TEROL	191.60	9.05	163.80	7.50	<0.001

**Table: 2- Comparison of Mean Serum Lipoprotein Values in Non Smokers Normotensives And Hypertensive Non Smokers**

	HYPERTENSIVES		NON SMOKERS NORMOTENSIVES		P-VALUE
	MEAN	SD	MEAN	SD	
HEART RATE	74.88	3.37	70.40	2.67	< 0.01
SBP	127.70	13.29	113.70	6.49	< 0.01
DBP	77.36	3.98	75.60	4.16	> 0.01
LDL	114.40	11.12	84.52	3.83	< 0.001
TRIGLYCERIDES	113.60	10.16	92.20	5.96	< 0.001
HDL	53.68	7.06	60.88	7.89	< 0.01
VLDL	22.52	2.10	18.44	1.19	< 0.01
T.CHOLESTEROL	190.50	9.39	163.80	7.50	< 0.001