

Study of Lipid Profile in Obese and Non-obese Students in Acharya Nagarjuna University

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ABSTRACT

Obesity is an excessive accumulation of energy in the form of body fat which impairs health. It is associated with an increased risk of developing various non-communicable diseases, including hypertension, coronary heart disease, diabetes, stroke and some forms of cancer. Obesity has been found to be associated with changes in levels of serum triglycerides and it may differ with age, sex, weight, height, BMI (Body Mass Index) and life style groups. This study aims at measuring and correlating values of Body mass index (BMI) with serum lipids and prevalence of dyslipidemia according to level of BMI in students of science college, Acharya nagarjuna university, Guntur(district), A.P

Keywords: Obesity, BMI and Dyslipidemia.

INTRODUCTION

Obesity refers to excess of body-fat. It is due to greater energy intake compared with energy expenditure. In India, Obesity Is Emerging As An Important Health Problem Particularly In Urban Areas, Paradoxically Co-Existing With Under Nutrition. Almost 30-65% Of Adult Urban Indians Are Either Overweight Or Obese Or Have Abdominal Obesity¹. The Rising Prevalence Overweight And Obesity In India Has A Direct Correlation With the Hypertension, The Metabolic Syndrome Dyslipidemia, Type 2 Diabetes Mellitus (T2DM), And Cardiovascular Disease (CVD)².

Obesity Is Always Associated With Increases In Plasma Triglycerides. Dyslipidemia Includes Hypertriglyceridemia, Reduced HDL Cholesterol, And Increased Numbers Of Small, Dense LDL Particles³. In 2014, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 600 million were obese. Overall, about 13% of the world's adult population (11% of men and 15% of women) was obese in 2014. In 2014, 39% of adults aged 18 years and over (38% of men and 40% of women) were overweight. The worldwide prevalence of obesity more than doubled between 1980 and 2014⁴.

According to world health organization (WHO), cardiovascular disorders are one of the morbidity and mortality accounting for 3 out of every 10 deaths is due to dyslipidemia. These were expected increase to annual death of 23.3 million by 2030⁵. Dyslipidemia Is An Important Major Risk Factor For Coronary Heart Disease (CHD), Which Is The Leading Cause Of Death In The United States. The World Health Organization Estimates That Dyslipidemia Is Associated With More Than Half Of Global Cases Of Ischemic Heart Disease And More Than 4 Million Deaths Per Year⁶.

This study was performed to assess the relationship of Body mass index (BMI) with serum lipids and prevalence

of dyslipidemia according to level of BMI in students of science college, Acharya nagarjuna university, Guntur(district), A.P.

MATERIAL AND METHODS

The study was carried out in Biochemistry department of Acharya nagarjuna university, Guntur(district), A.P, July, 2017. Total 100 students with age group between 23-25 yrs were taken as subjects. Information about Name, Age (years), Sex, Education, Occupation, Weight (kilogram), Height (meter), Address, any history of metabolic diseases (diabetes, hypertension etc.) is obtained from each subjects. The weight was taken using battery operated body weight scales & height was measured by using a 'drop down' tape measure fixed at about 2metres on a wall, subjects were asked to remove any heavy objects with them like keys, wallet, ornaments, and shoes etc. before taking the readings for weight & height.

BMI calculated for all the subjects using readings of weight in kilograms & height in meter.

$BMI = \text{Weight (kg)} / \text{Height (m)}^2$ ⁷.

Normal values for bmi

Under weight	: <18.5
Normal weight	: 18.5-24.9
Over weight	: 25-29.9
Obesity	: >30

All the subjects were divided into two groups according to their BMI values.

Group –I Obese
Group –II Non obese

After an overnight fast venous blood (5 mL) was drawn from each participant and transferred to new plain screw-capped disposable plastic tubes. After collection of blood sample they were centrifuge for the serum separation. centrifuge done for 10mins at 1000 rpm.

Table 1: Parameters under observation

Parameters	Obese group-1 (n-40)	Non obese group-2 (n-40)	Normal values
Total Cholesterol	228.5mg/dl ± 2.5-4	181.6±1.2-2	<200mg/dl
TAG	191.5mg/dl ± 1.7-2.5	133.7±2.5-4	<161mg/dl
LDL	129.3mg/dl ± 2.7-4	85.8±2-3	<100mg/dl
HDL	40.6mg/dl ± 1.3-2	38.7±1-1.8	Males: 36-65mg/dl Females: 35-80mg/dl

P<0.05.

1ml of serum was separated for biochemical parameters ie Total Cholesterol(TC),Tricaylglycerides(TG),low density lipoproteins(LDL) and High density lipoproteins(HDL). Estimation of serum total cholesterol by cholesterol oxidase / phenol amino antipyrine method (CHOD-PAP)⁸. Estimation of serum HDL cholesterol by immuno-inhibition method and LDL-cholesterol were calculated according to the Friedewald equations⁹.
Friedewald formula: $LDL = TC - (HDL + TG/5)$
 Estimation of serum triglyceride by glycerol phosphate oxidase (GPO) method¹⁰.

RESULTS AND DISCUSSION

Among all the students TAG was significantly higher in obese students than in normal weight students. TC and LDLC were also significantly higher in obese students than normal weight students. The level of HDL is almost same in both groups(Table -1 andFigure-1)

DISCUSSION

When various parameters of blood lipid profile were compared it was observed that there was significant difference between obese and non-obese subjects in relation to total cholesterol triglycerides and high density lipoprotein. On the average, the more fat, the more likely an individual will be dyslipidemic and to express elements of the metabolic syndrome. Literature data are already demonstrating that although young, many university students already have risk factors for chronic diseases and metabolic diseases¹¹. In order to check the lipid profile of nutrition students and their relationship with other cardiovascular risk factors, a study in Santa Catarina, Brazil, with 63 university students, whose ages were 17-43 years identified low HDL-c in 47.6% of students and found hypercholesterolemia in 38.1% of them¹².

According to a study of blood triglyceride in obese and overweight patient at Cardiology department, University of Lubin, 2003¹³. It was observed that the total triglycerides concentrations is higher in obese. A study conducted at Tufts University in Boston, United States, with 564 (mean age=19.1 years) students found that 16.2% of the students already were overweight/obese. Furthermore, a strong association was found between overweight and high levels of TC and LDL-c, as well as between physical activity and increased HDL-c and a lowering of triglyceride levels¹⁴.

CONCLUSION

It may be concluded from the findings of this study that there is a high prevalence of abnormal lipid profile in university students which is not known to students and may lead to complications in later life. The lipid indices (Total cholesterol /Triglycerides /HDL/LDL) are more in obese students than non obese students.

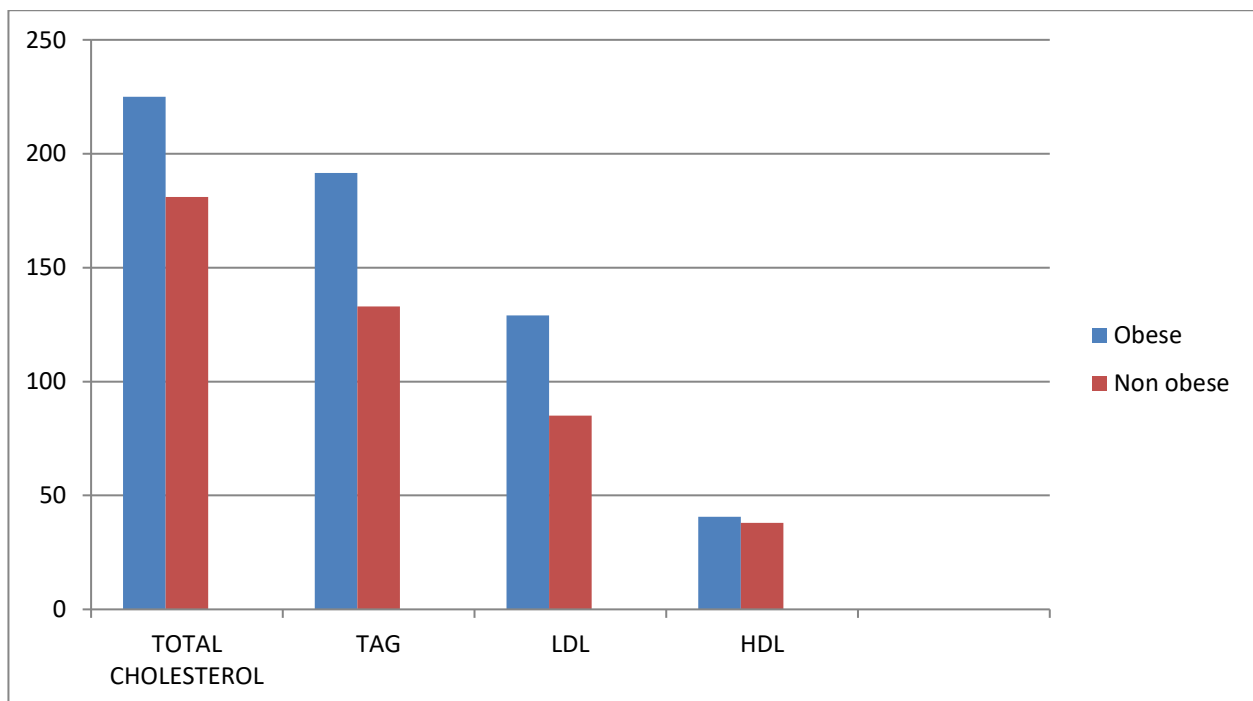


Figure-1: Graphical Representation of Results

These results indicated that may be developing cardiac problems in older age that leads to death. Diet, family history and Smoking are important risk factors for abnormal lipid profile in young students about which awareness is needed.

The persons should follow the diet restrictions for the control of lipid levels in their body. Prevent the alcohol and smoking habits. Don't take junk foods overly. To follow the regular exercises in their life that may be some helpful for fat reduction

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