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ORIGINAL ARTICLE

A Comparative Study of Lipid Profile in Obese and Nonobese Men attending Master Health Checkup

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ABSTRACT

Introduction: Obesity is emerging as an epidemic worldwide. Obesity is associated with a number of comorbid conditions, such as diabetes mellitus, hypertension, cancer, dyslipidemia, cardiovascular abnormalities, anemia, obstructive sleep apnea, and psychosocial abnormalities.

Aim: This study aims at comparing the lipid profile levels of obese and nonobese men.

Materials and methods: This was a case–control study conducted at a tertiary care center. Totally, 80 men in the age group of 20 to 47 years attending the master health checkup were included in the study, out of which 40 men with normal body mass index (BMI) of 18 to 25 belonged to group I and 40 men with increased BMI of 30 and above belonged to group II. Lipid profile parameters, such as triglycerides (TGLs), total cholesterol, high-density lipoprotein (HDL) cholesterol, and low-density lipoprotein (LDL) cholesterol were estimated in them. The data were statistically analyzed using Statistical Package for the Social Sciences (SPSS) software version 15.0.

Results: Statistically significant difference was found in the total cholesterol levels with a p-value of 0.040 while the difference in LDL cholesterol was statistically highly significant with a p-value of 0.040.

Conclusion: Among lipid profile parameters, only total cholesterol and LDL cholesterol showed significant difference between the obese and nonobese individuals. However, the other parameters like HDL cholesterol and TGLs did not show any significant difference.

Keywords: Body mass index, Lipid profile parameters, Low-density lipoprotein cholesterol, Obese, Total cholesterol.

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INTRODUCTION

The World Health Organization has described obesity as one of today's most neglected public health problems, affecting every region of the globe.[1] The worldwide prevalence of obesity has nearly doubled between 1980 and 2008. Worldwide, at least 2.8 million people die each year as a result of being overweight/obese.[2] Obesity has reached epidemic proportion in India with morbid obesity affecting 5% of the country's population. In the World Health Survey, the prevalence of physical inactivity in India was 9.3% in men and 15.2% in women.[3] As the rate of obesity climbs, obesity-related diseases and conditions follow with similar rates. The cost of health care is increased and also imposing a huge burden on our economy and health care system.[4] Obesity is associated with a number of comorbid conditions, such as diabetes mellitus, hypertension, cancer, dyslipidemia, cardiovascular abnormalities, anemia, obstructive sleep apnea, and psychosocial abnormalities.

The global emergence of obesity and diabetes is as much an economic issue as it is a health issue. Physical inactivity and unhealthy diet are major causes for the change in social and economic conditions.[5] The prevalence of raised BMI increases with income level of countries up to upper middle income levels.[2] Studies have shown that obesity in males in the reproductive age group has led to an increase in male infertility, which may be associated with decreased pregnancy rates and increased pregnancy loss in couples who undergo artificial reproductive treatment.[6,7]

As the rate of obesity climbs, obesity-related diseases and conditions follow with similar rates. The cost of health care is increased and also imposes a huge burden on our economy and health care system.[4] This study aims at comparing the lipid profile levels of obese and nonobese men.

MATERIALS AND METHODS

This study was conducted in men attending the master health checkup program at Sri Ramachandra Medical College and Research Institute, India. Totally, 80 men in the age group of 20 to 47 years, weight > 45 kg, nonsmokers, nonalcoholics, and nondiabetics were included in the study. Women and men with infectious, inflammatory,

Table 1: Lipid profile parameters in controls

Variable	*Mean value*	*Standard deviation*	*Unit*
Total cholesterol	165	±33	mg/dL
Triglycerides	124	±62	mg/dL
HDL cholesterol	42	±8	mg/dL
LDL cholesterol	111	±27	mg/dL

Table 2: Lipid profile parameters in cases

Variable	*Mean value*	*Standard deviation*	*Unit*
Total cholesterol	180	±32	mg/dL
Triglycerides	151	±73	mg/dL
HDL cholesterol	39	±7	mg/dL
LDL cholesterol	128	±30	mg/dL

Table 3: Comparison of BMI between controls and cases

Parameter	*Controls (n = 40)*	*Cases (n = 40)*	*p-value*	*Statistical significance*
Age	32.9 ± 7.1	34.7 ± 7	0.269	NS
BMI	21.8 ± 1.6	32.5 ± 2.4	0	HS

NS: Not significant; HS: Highly significant

Table 4: Comparison of lipid profile between controls and cases

Parameter	*Controls (n = 40)*	*Cases (n = 40)*	*p-value*	*Statistical significance*
Total cholesterol	165 ± 33	180 ± 32	0.040	S
TGL	124 ± 62	151 ± 73	0.077	NS
HDL	42 ± 8	39 ± 7	0.089	NS
LDL	111 ± 27	128 ± 30	0.010	HS

S: Significant; NS: Not significant; HS: Highly significant

renal, and cardiac diseases were excluded from the study. The study subjects were divided into two groups. Group I consisted of 40 subjects with normal BMI between 18 and 25. Group II consisted of 40 subjects with increased BMI from 30 and above.

The study was conducted after obtaining the ethical clearance from the Institutional Ethics Committee. A written informed consent was obtained from each participant before commencement of study.

The data were collected through a standard questionnaire. All subjects were interviewed regarding full medical history that included age, sex, occupation, family history, and if there was any previous illness. The general physical examination procedure included measurement of blood pressure, height, and weight followed by calculation of BMI . The BMI was measured using the formula, weight in kilograms/height in meters.[2] Fasting blood samples were collected from the subjects in yellow-topped gel vacuum tubes. The samples were centrifuged after 30 minutes of collection. Lipid profile parameters, such as TGLs, total cholesterol, HDL cholesterol, and LDL cholesterol were measured in the serum. These parameters were analyzed in Siemens Advia 1800 fully automated analyzer.

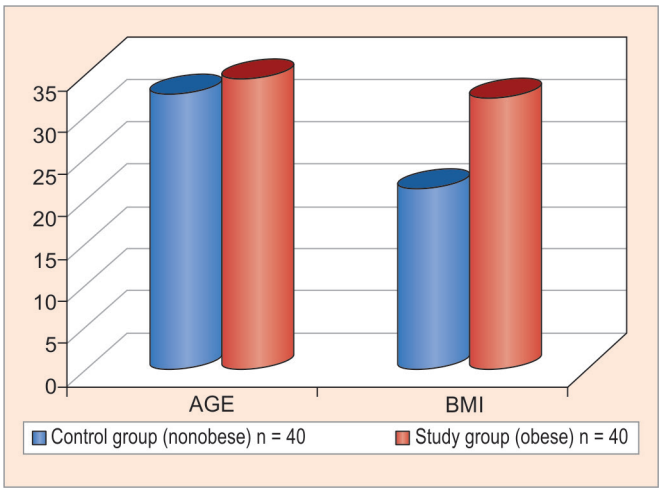
RESULTS

All the results obtained were statistically analyzed using SPSS software version 15.0. Mean and standard deviation were found for all parameters. Independent sample t-test was performed to check for the statistical significance for differences in mean between the groups.

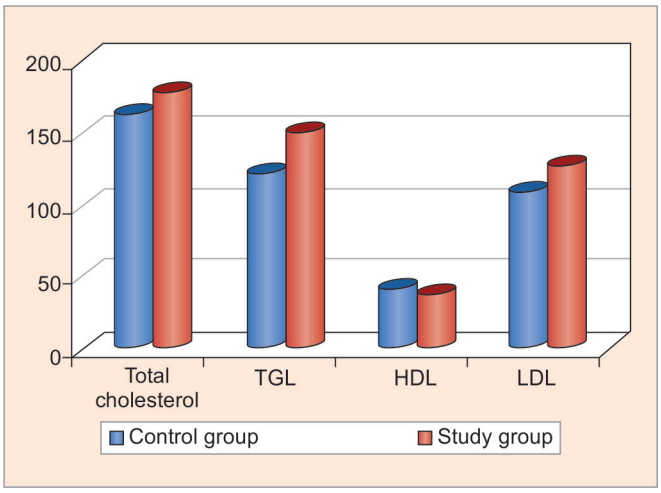
Table 1 shows the mean values of lipid profile parameters in the normal BMI group. Table 2 shows the mean values of lipid profile parameters in the increased BMI group. Table 3 shows the comparison of BMI between the normal and increased BMI groups. Table 4 shows the comparison of lipid profile parameters between the normal and increased BMI groups. Graph 1 shows comparison of BMI between controls and cases. Graph 2 shows comparison of BMI between controls and cases

DISCUSSION

The prevalence of obesity has increased dramatically in recent years and is associated with several chronic diseases, such as coronary artery disease, hyperten-



Graph 1: Comparison of BMI between controls and cases



Graph 2: Comparison of lipid profile between controls and cases

sion, metabolic syndrome, and type II diabetes mellitus. Obesity is emerging as one of the major health issues.

As shown in Table 3, there was significant difference in the BMI of individuals of the normal and increased BMI groups. As shown in Table 4, the mean values of total cholesterol in the normal and increased BMI groups were found to be 165 ± 33 and 180 ± 32 respectively, which showed a statistically significant difference with a p-value of 0.040. The mean value of TGLs of normal BMI group was 124 ± 62 and increased BMI group was 151 ± 73, but there was no statistically significant difference with a p-value of 0.077. The mean HDL cholesterol value of normal BMI group was 42 ± 8 and increased BMI group was 39 ± 7 and statistically there was no significance between the two groups with a p-value of 0.089. The mean LDL cholesterol value in normal BMI group was 111 ± 27 and increased BMI group was 128 ± 30. There was a statistically highly significant difference in the mean LDL cholesterol values with a p-value of 0.010. There is a small difference in mean values of the TGL and HDL cholesterol between the two groups, but no statistically significant difference was observed, which could be due to other confounding factors, such as dietary intake, hereditary causes, etc.

The lipid profile parameters, such as total cholesterol and LDL cholesterol showed a statistically significant difference between the normal BMI group and increased BMI group. The rise in these parameters is associated with increase in the risk of developing atherosclerosis, type II diabetes mellitus, etc. This study was done to see the lipid profile pattern in the men attending master health checkup. Total cholesterol and LDL cholesterol are elevated in these men. The LDL cholesterol is found both within atherosclerotic plaque and in plasma as oxidized LDL, which is responsible for the inflammatory events.[8] Awareness about the lipid parameters is necessary to prevent complications. Lifestyle modifications including diet and exercise help in controlling the levels.

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