

**COMPARISON OF DYSLIPIDAEMIA AMONG ASYMPTOMATIC OBESE INDIVIDUALS**

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**Background:** -Present study was therefore performed to assess the association between high BMI and dyslipidemia in asymptomatic obese patients. **Method:** - 110 subjects underwent physical examination, lipid profile and anthropometric Measurements (Height, weight, BMI).

**Results and Conclusion:** - there was an increased risk of dyslipidaemia among the high BMI group. Hyperlipidaemia was found to be dangerously high in obese population especially in males.

**Key Words:** Obesity, Body mass index, Dyslipidemia

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**Introduction:**

Obesity has emerged as a 'global epidemic' In the modern era. We find ourselves at the epicentre of a global pandemic of obesity. The prevalence of obesity is increasing to epidemic proportions at an alarming rate in both developed and less-developed countries around the world.<sup>1</sup>

Obesity is a complex, multi-factorial, chronic condition that is associated with mortality and significant morbidity and is prevalent worldwide.<sup>2</sup>

Obesity and overweight pose a major risk for serious chronic diseases like Type 2 diabetes, Hypertension, Ischemic heart disease, Osteoarthritis, Dyslipidaemia and Cholelithiasis, out of that sizable proportion remains asymptomatic.<sup>3</sup>

Body mass index (BMI; in kg/m<sup>2</sup>) is widely used for the classification of overweight (BMI = 25 kg/m<sup>2</sup>) and obesity (BMI = 30 kg/m<sup>2</sup>) in men and women. BMI correlates reasonably well with laboratory-based measures of adiposity for population studies,<sup>4</sup> and is extremely practical in most clinical settings.

A recent study by ICMR on the prevalence of dyslipidaemia among the rural population of India had shown that 13.9% had hypercholesterolemia, 29.5% had hypertriglyceridemia, 72.3% had low high-density lipoprotein-cholesterol (HDL-C), 11.8% had high low-density lipoprotein-cholesterol (LDL-C) levels and 79% had abnormalities in one of the lipid parameters.<sup>5</sup>

The present study was therefore performed to assess the association between high BMI and dyslipidaemia.

**Aim:** - The aim of the study was to evaluate the lipid profile of asymptomatic obese patients.

**Material and Methods:**

This was a cross-sectional study of 110 subjects attending the medical outpatient department (OPD) of a government medical college GG hospital Jamnagar. Subjects with chronic illness, smoking, alcoholism and diabetes mellitus, and patients who were already on lipid lowering, were excluded from the study.

after an overnight fast of 12-14 h, weight was measured by a machine that was calibrated daily using a weight of 5 kg, and height was measured in the standing position without shoes, at the level of the vertex by using the wall scale.

The measurement tools used was BMI = weight in kg/height in meters (square), i.e. mass (kg)/height<sup>2</sup> (m<sup>2</sup>). The blood sample (5 mL) was drawn from the antecubital veins in the sitting position for lipid profile. Laboratory parameters: Cholesterol (TC), LDL, HDL and triglyceride (TG) were determined directly by using an automated chemistry analyser.

The presence of dyslipidaemia was considered according to the updated National Cholesterol Education Programme (NCEP) Adult Treatment Panel III (ATP III) recommendations. All the data were recorded and analysed through computer package GraphPad.

The results were given in text as mean and standard deviation (SD) for continuous variables (age, lab investigations, etc.) and frequency/percentages for categorical variables (gender, symptoms, etc.). The Student's t-test was used for comparison between categorical variables, i.e. lipid profile, and BMI subjects at  $P \leq 0.05$ .

**Result:**

The study was carried out on 110 obese subjects among them 53 were male and 57 were female. Out of the 110-subject studied, 27.27% (30) belonged to Group-I, 23.62% (26) belonged to Group-II, 24.54% (27) belonged to Group-III and Group-IV.

Table 1. BMI in different study groups

BMI (kg/m <sup>2</sup> )	Group	n = 110 (no. of subject)	
25.0 – 29.9	I	30	27.27%
30.0 – 34.9	II	26	23.63%
35.0 – 39.9	III	27	24.54%
>40	IV	27	24.54%

Table 2. Lipid parameters of study population (females)

Lipid Profile (Female)	Group 1	Group 2	Group 3	Group 4
Total Cholesterol	201 ± 28.18	205 ± 23.12	203 ± 19.67*	210 ± 25.98
HDL	43 ± 14.54	46 ± 12.67	42 ± 8.53	38 ± 10.12
S. Triglyceride	169 ± 17.32	168 ± 19.43	170 ± 12.42	173 ± 25.67*
LDL Cholesterol	120 ± 26.17	125 ± 23.76	123 ± 21.34	128 ± 28.54*

\*P<0.05

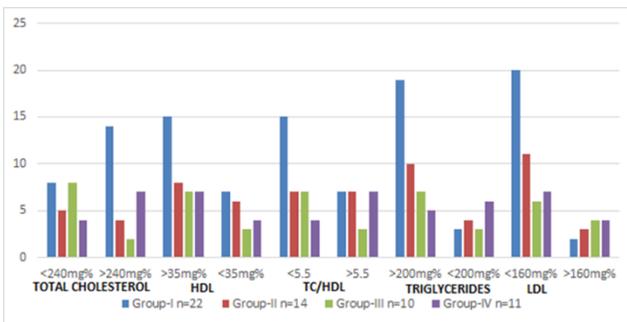
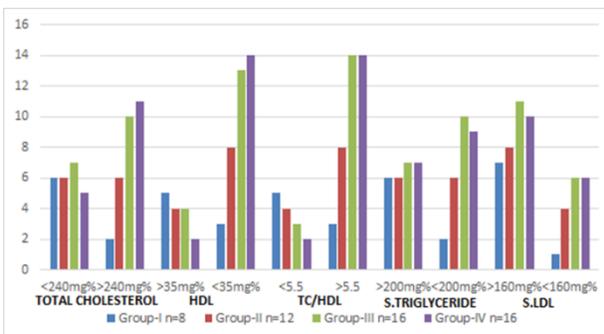


Table 3. Lipid parameters of study population (Males)

Lipid profile (Male)	GROUP 1	GROUP 2	GROUP 3	GROUP 4
Total cholesterol	209.2 ± 21.53*	210.6 ± 24.14*	214.5 ± 30.21*	212.8 ± 35.37*
HDL	40 ± 10.15	37 ± 8.7	35 ± 12.14	32 ± 16.28
S. TRIGLYCERIDE	170 ± 18.23*	172 ± 20.13	169 ± 25.23	180 ± 28.64*
LDL CHOLESTEROL	128 ± 23.12*	125 ± 25.37	130 ± 21.14	135 ± 27.17*

\*P<0.05



**Discussion:**

Prevalence of Hyperlipidaemia was found to be dangerously high in obese population especially in males. This data points towards a high risk of coronary artery disease in obese patients particularly in men. Similar study by Megnier (1999) also showed higher levels of triglycerides and cholesterol & lower level of HDL in obese patients particularly men. Arcaru (1999) & Turcato (2000) also found higher lipid levels among obese subjects. Relatively lower levels of lipids in females may be due to genetic & hormonal factors.

Out of 110 asymptomatic 110 obese subjects 59 (53.64%) were found to have hypercholesterolemia, hypertriglyceridemia, high level of LDL & low level of HDL cholesterol. There is a linear relationship between BMI, hypercholesterolemia, hypertriglyceridemia, high level of LDL & low level of HDL cholesterol.

Out of 53 male subjects, 29 (54.71%) were found to have hypercholesterolemia, 2 (6.89%) in Group-I, 6 (20.69%) in Group-II, 10(34.48%) in Group-III & 11(37.93%) in Group-IV. Similarly 38 (71.7%) male subjects were found to have low level of HDL cholesterol [3 (7.89%) in Gp-I, 8 (21.1%) in Gp-II, 13 (34.21%) in Gp-III & 14 (36.84%) in Gp-IV]. While 27 (50.9%) subjects were found to have hypertriglyceridaemia [2 (7.4%), 6 (22.22%), 10 (37.04%) & 9 (33.33%) in Group-I,II,III & IV respectively]. 17 subjects were found to have high level of LDL cholesterol [1 (5.9%), 4 (23.5%), 6 (35.3%) & 6 (35.3%) in Group- I,II,III & IV respectively]

Out of 57 female subjects 17 (29.8%) were found to have hypercholesterolemia [4 (23.53%), 4 (23.53%), 2 (11.76%) & 7 (41.18%) belongs to Group-I, II, III & IV respectively]. 20 subjects were found to have low level of HDL cholesterol [7(35%), 6(30%), 3(15%) & 4(20%) in Group-I, II, III & IV respectively].

Dyslipidaemia is also increased by obesity. Obesity is characterized by a slightly increased prevalence of hypertriglyceridemia, together with elevated total cholesterol as well as decreased cholesterol levels.

Obesity, particularly the abdominal obesity phenotype is associated with hypertriglyceridemia, low HDL cholesterol & increased proportion of small dense LDL particles. <sup>6-8</sup>

Most studies also suggest that overweight & obesity are associated with an increase in serum total & LDL cholesterol concentration.<sup>7</sup> However, BMI associated differences in total & LDL cholesterol are more pronounced at lower body weight & become blunted with increasing age.

The abnormalities in serum lipid associated with obesity, are clinically important & are clearly associated with an increased risk of CHD.<sup>9,10</sup>

Obese individuals with a high accumulation of visceral adipose tissue tend to have hypertriglyceridemia & low concentration of HDL cholesterol.<sup>11</sup>

In 2001, M. K. Jain & Sandeep T. K. conducted study on obesity by group them in 4 group according to BMI. All obese subjects in this study were found to harbour one or more of the various complication like Type-II DM, Hypertension, Ischemic heart disease, Osteoarthritis, Gall stones & Dyslipidaemia, many of them were asymptomatic or not aware until they were screened for these complications.<sup>12</sup>

#### **Study limitations:** -

This study has certain limitations including the cross-sectional design, and hence the causative nature of the association between the anthropometric measures and the different risk factors cannot be established. Therefore, larger, longitudinal studies including subjects of both sexes and from all age groups should be conducted.

#### **Conclusion:**

By analysing the results of the study conducted, it was concluded that there was an increased risk of dyslipidaemia among the high BMI group. The prevalence of dyslipidaemia in asymptomatic subjects emphasizes the need for routine health screening for early preventive measures.

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