Original Research Paper

Volume - 12 | Issue - 03 | March - 2022 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Physiology

STUDY ON RELATIONSHIP BETWEEN OBESITY & LIPID PROFILE IN NORMAL POPULATION OF CENTRAL UTTAR PRADESH

Dr. S. K. Sant	Professor & Head, Department of Physiology, UPUMS, Saifai, Etawah.
Dr. R. S. Rajpoot	Professor, Department of Physiology, UPUMS, Saifai, Etawah.
Dr. Anmol Mehray*	Junior Resident, Department of Physiology, UPUMS, Saifai, Etawah. *Corresponding Author
Dr. Pankaj Kumar Rai	Junior Resident, Department of Physiology, UPUMS, Saifai, Etawah.
Dr. Dhirendra Vaidya	Junior Resident, Department of Physiology, UPUMS, Saifai, Etawah.
Dr. Rajshree Gupta	Junior Resident, Department of Physiology, UPUMS, Saifai, Etawah.
Dr. Nouratan Singh	L.T., Department of Physiology, UPUMS, Saifai, Etawah.

ABSTRACT **INTRODUCTION:** Obesity is generally considered to play a key role in the metabolic syndrome, including hypertension. Metabolic syndrome is defined as a cluster of as a combination of obesity, insulin resistance, hyperinsulinemia, dyslipidaemia and hypertension. Other measures of obesity apart from Body Mass Index (BMI) are Waist Circumference (WC) and Height Weight Ratio (HWtR) and are efficient risk factors for prediction of CVD in children. BMI is calculated as person's weight (kg) divided by height in meters (m^2). **MATERIAL & METHODS:** Correlation between BMI and lipid profile were studied in a sample of 270 people (154 males & 116 females). **RESULT:** In our study, we found that Mean total cholesterol of Group I and Group II patients was 163.88±50.17 mg/dl and 184.02±36.31 mg/dl respectively. Total mean total cholesterol of the patients was 173.95±44.86 mg/dl. Triglycerides in Group I and Group II patients was 152.84±58.82 mg/dl and 157.28±73.29 mg/dl respectively. Total mean total cholesterol of the patients was 155.06±66.37 mg/dl. HDL in Group I and Group II patients was 48.55±16.76 and 47.03±9.06 respectively. Total mean total cholesterol of the patients was 47.79±13.47 mg/dl. The mean LDL of Group I and Group II patients was 85.04±36.13 mg/dl and 113.1926±24.35 mg/dl respectively. Total mean LDL of the patients was 99.11±33.83 mg/dl. **CONCLUSION:** Total Cholesterol and LDL of the studied patients have shown significant correlation in both groups ($p<0.05$). Triglycerides and HDL of the studied patients have shown non-significant correlation in both groups. ($p>0.05$)

KEYWORDS : Total Cholesterol, BMI, Triglycerides, dyslipidaemia.

INTRODUCTION

Obesity is normally taken into consideration to play a key position in the metabolic syndrome, along with hypertension.[1] Metabolic syndrome is described as a cluster of adiposity, insulin resistance, hyperinsulinemia, dyslipidaemia and hypertension.[2] The sample of obesity is now normally taken into consideration to play a vital position in Metabolic syndrome. In particular, obesity has been stated to play a key position in the above referred illnesses as compared with different measurements of nearby or generalized obesity.[3,4,5]

It has been seen that there has been a continuous population emigration at some point of time, with differential affects at the interplay among those companies and their new societies. The significant number of the Japanese landed in Brazil in first 1/2 of Twentieth Century and these days their large community of Japanese residing outdoor Japan (about a million and 300 thousand people), with 65.0% of them residing in State of São Paulo. [6]

Japanese immigration to America (United States, and Brazil) added major modifications in nutritional conduct and way of life of those people, which brought about the bigger consumption of fats, non-complicated carbohydrates and proteins [7,8], sedentary way of life and extended stress levels. This mechanism was termed as "Westernization".[9,10] The significance of that "Westernization" were visible as increase in incidences of Type-2 Diabetes Mellitus (DM-2), even above the quotes visible in Japan or even in Brazil [11,12,13] insulinemia which resulted in increase in the resistance to the insulin and occurrence of the Metabolic syndrome (SM).

Despite multiplied attention to its medical effects and public fitness burden, the prevalence of obesity among U.S. adults remains excessive (36.50%), without any significant decrease.[14] Similarly, occurrence of hypertension (HTN) among various adults remained unaffected all throughout latest years (30.8%).[15] At same time, atrial fibrillation (AF) represents the growing medical and public fitness problem.[16] The occurrence of AF has been predicted to be 2.7 to 6.1 million in the U.S.[17, 18] and to 6.5 to 12.3 million in the EU.[19] These figures are forecasted to double in the approaching decades,[20] because of population getting older and growing occurrence of the predisposing persistent conditions. AF stays regularly silent and undetected.[21]

Many researches primarily based on epidemiology have predicted approximately 1/2 of AF threat on the population levels will be defined with the aid of using the conventional cardiovascular disease (CVD) threat-factors,[22] amongst which, the obesity, and hypertension are primary contributors.[23,24]

Obesity is related to several comorbidities including coronary heart disease, Type-2 diabetes, hypertension, various cancers, sleep apnea and many other different disorders.[25] Because of the sedentary lifestyle, socioeconomic status, leisure activities including television, computer and video games the chances of increasing body weight and obesity has been multiplied.[26]

The causes of obesity are multi-factorial which incorporates genetic, environmental and mental factors. Changing diet (excessive fats enriched diet) and decreased physical activity (sedentary style) are believed to be the two vital reasons for adolescent weight gain.[27]

Body Mass Index (BMI), Waist Circumference (WC) and Height Weight Ratio (HWtR) are measures of obesity and are threat element predictors of CVD in children; BMI is a degree of relative measure, primarily based on the mass and height of an individual.[28,29]

Numerous obesity parameters were used to evaluate body fat.[30,31] Certain obesity parameters were beneficial in assessing cardiovascular threat [32], few others in estimating threats of diabetes mellitus especially Type-2[33]. The outcomes of the preceding research on the adiposity and arterial stiffness haven`t been consistent.[34,35,36]

Abdominal volume index and conicity index are latest novel obesity indices which had been covered in study.[32] Moreover, in majority researches, observations were made primarily based totally on the WHO classification of body weight. But we have been into consideration that the BMI classification for Asian population, BMI >25kg/m^2 will be taken into consideration as obese.[37] A latest research found central obesity is related to arterial stiffness in middle-elderly adults[38] however in the present study young adults had been taken into consideration.

MATERIAL AND METHODS

The present prospective comparative observational study was conducted over 330 in Department of Physiology, U.P.U.M.S. Saifai, Etawah, UP, during the study period of June 2020 to December 2021. Patients of both sex after obtaining the consent form the patient or their relatives were studied.

Inclusion Criteria

- Subjects without any chronic disease and under any long term medication.
- Subjects don't have any substance abuse.
- Subject who were willing to participate in the study.

Exclusion Criteria

- Subjects with any chronic disease and under any long term medication.
- Subjects with history of substance abuse.
- Subject unwilling to participate in the study.

Study Groups

Group 1: Consists of study subjects of 20-50 year of age those were having abdominal obesity according to inclusion criteria.

Group 2: Consists of study subjects of 20-50 year of age those were not having abdominal obesity according to exclusion criteria.

Sample Size: Total 270 cases were recruited for the study.

Sample size calculation: The required sample size for the study was calculated using the following formula:

$N= 4pq/d^2$

Here,
p= Expected prevalence in population based in previous study
q=1-p
d= Absolute error

Taking the prevalence(p) 26.35% for abdominal obesity as per the study Overweight and Obesity above 18 years of Age in An Urban Population in India and absolute permissible error(d) of 5% with 5% level of significance and at 95% of confidence limit the following values are obtained P= 0.2635 the prevalence of abdominal obesity in urban population
Q= 1-p =0.7365
D= 5% =0.05

Sample size according to formula = 310.50
Assuming non response rate of 5%, the final sample size = 330.

Study Tool

Predesigned, pretested proforma for data collection.

Screening/Survey

A total of 330 patients were screened out of which 60 were not fit according to inclusion criteria and finally 270 patients were found fit according to inclusion criteria.

Staff qualification and training

All the patients were examined by an expert physician and supportive medical team and after those routine clinical examinations were done to the analysis of not having any chronic illness.

Quality-control measures to check data completeness and consistency

Local and English language was preferred to ask each patient's history and it was taken using a confidential questionnaire formulated by the staff members. The questionnaire included questions providing information on personal data, which were next properly encoded.

Detailed history of each subject was taken which include their personal history, past history and family history. Thorough general and systemic examination was carried out to rule out any clinically apparent disease. The information was entered on a proforma given to each subject.

Following an explanation about nature, and purpose of study, those subjects who are willing to participate was included and informed consent was recorded from subject,

Confounders

The patient's outcome was defined by findings of a clinical examination. Patients were asked about their clinical, and other characteristics were noted. In patients having any other symptoms or any type of comorbidity or infection and its association were recorded.

Ethical clearance

The research procedure followed was in accordance with approved ethical standards of Department of Medicine U.P.U.M.S. Saifai, Etawah; UP, India Ethics Committee (Human).

Statistical Analysis

Statistical Package for Social Sciences (SPSS) version 23 and Microsoft Excel were used in creating the database and producing graphs for Windows.

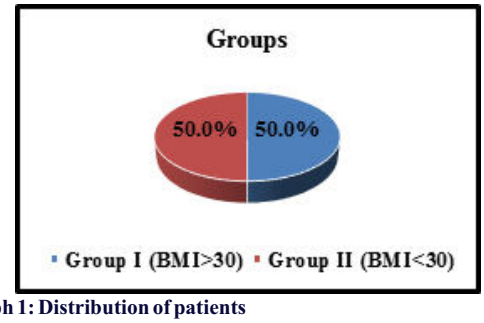
Mean and standard deviation (±SD) were used to determine quantitative data meeting normal distribution.

RESULTS & DISCUSSION

In our study total 270 patients were sub-divided in two groups Group I and Group II of 135 patients each. In Group I BMI>30 kg/m^2 patients were taken and in Group II BMI<30 kg/m^2 patients were taken **(Table 1)**.

Table 1: Distribution of patients

Groups	No of Patients (n=270)	Percentage (%)
Group I (BMI>30)	135	50.0
Group II (BMI<30)	135	50.0

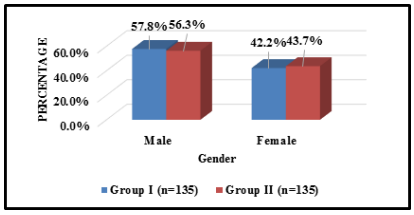


Graph 1: Distribution of patients

In Group I there were 78 (57.8%) males and 57 (42.2%) females and in Group II there were 76 (56.3%) males and 59 (43.7%) were females (Table 2). Both the groups implied male dominance and shown non-significant correlation (p>0.05).

Table 2: Distribution of the studied patients on the basis of their gender among the groups

Sex	Group I (n=135)	Group II (n=135)	Total (n=270)	p-value
Male	78 (57.8%)	76 (56.3%)	154 (57%)	0.902
Female	57 (42.2%)	59 (43.7%)	116 (43%)	



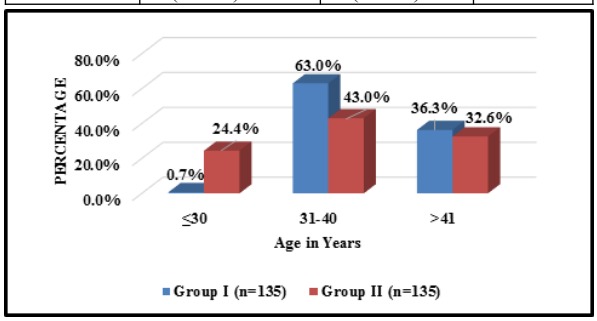
Graph 2: Distribution of the studied patients on the basis of their gender among the groups

In our study, majority of patients in both groups were of 31-40 years of

age group i.e., 85 (63.0%) patients in Group I and 58 (43.0%) patients in Group II (Table 3).

Table 3: Distribution of the studied patients on the basis of the age group in different groups

Age Group	Group I (n=30)	Group II (n=30)	p-value
≤30	1 (0.7%)	33 (24.4%)	
31-40	85 (63.0%)	58 (43.0%)	
>41	49 (36.3%)	44 (32.6%)	



Graph 3: Distribution of the studied patients on the basis of the age group in different groups

In our study, the mean age of Group I and Group II patients was 40.13±4.42 and 36.81±8.03 years respectively. Total mean age of the patients was 38.47±6.68 years.

The mean weight of Group I and Group II patients was 82.91±7.54 and 69.09±7.15 kg respectively. Total mean Weight of the patients was 76.00±10.08 kg.

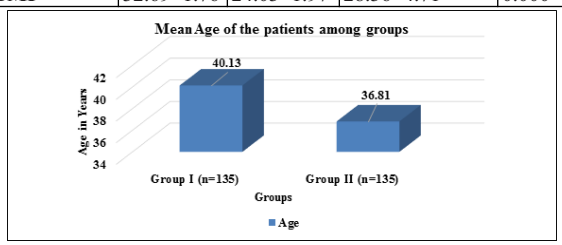
Mean Height of Group I and Group II patients was 1.58±0.05 and 1.69±0.07 meters respectively. Total mean Height of the patients was 1.64±0.08 meters.

Mean BMI calculated in Group I and Group II was 32.69±1.76 kg/m^2, 24.03±1.97 kg/m^2 respectively. Total mean BMI of the patients was 1.64±0.08 kg/m^2.

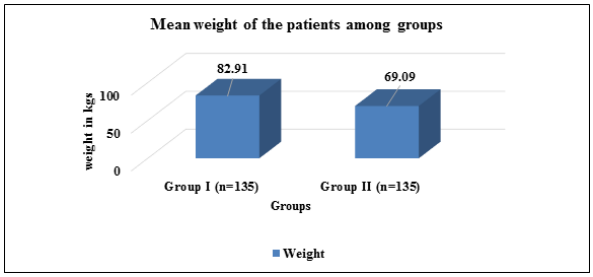
Age, weight, Height, BMI of the studied patients have shown significant correlation in both groups (p<0.05) **(Table 4)**.

Table 4: Demographic characteristics of the study sample classified by BMI

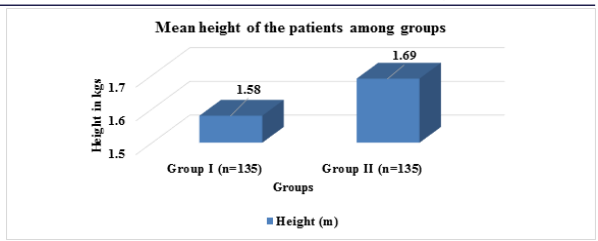
Demographic	Group I (n=135)	Group II (n=135)	Total Mean± SD	p-value
Age	40.13±4.42	36.81±8.03	38.47±6.68	0.000
Weight	82.91±7.54	69.09±7.15	76.00±10.08	0.000
Height m	1.58±0.05	1.69±0.07	1.64±0.08	0.000
BMI	32.69±1.76	24.03±1.97	28.36±4.71	0.000



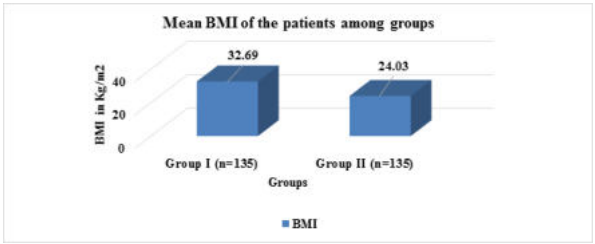
Graph 4a: Mean Age of the patients among groups



Graph 4b: Mean weight of the patients among groups



Graph 4c: Mean height of the patients among groups



Graph 4d: Mean BMI of the patients among groups

In our study, we found that Mean total cholesterol of Group I and Group II patients was 163.88±50.17 mg/dl and 184.02±36.31 mg/dl respectively. Total mean total cholesterol of the patients was 173.95±44.86 mg/dl.

Triglycerides in Group I and Group II patients was 152.84±58.82 and 157.28±73.29 respectively. Total mean total cholesterol of the patients was 155.06±66.37 mg/dl.

HDL in Group I and Group II patients was 48.55±16.76 and 47.03±9.06 respectively. Total mean total cholesterol of the patients was 47.79±13.47 mg/dl.

The mean LDL of Group I and Group II patients was 85.04±36.13 and 113.1926±24.35 respectively. Total mean LDL of the patients was 99.11±33.83 mg/dl.

Total Cholesterol and LDL of the studied patients have shown significant correlation in both groups (p<0.05). Triglycerides and HDL of the studied patients have shown non-significant correlation in both groups. (p>0.05) **(Table 5)**.

Table 5: Lipid Profile characteristics of the study sample classified by BMI

Lipid Profile	Group I (135)	Group II (135)	Total Mean ± SD	p-value
Total Cholesterol	163.88±50.17	184.02±36.31	173.95±44.86	0.000
Triglycerides	152.84±58.82	157.28±73.29	155.06±66.37	0.584
HDL	48.55±16.76	47.03±9.06	47.79±13.47	0.356
LDL	85.04±36.13	113.1926±24.35	99.11±33.83	0.000

In our study total 270 patients were sub-divided in two groups Group I and Group II of 135 patients each. In Group I BMI>30 patients were taken and in Group II BMI<30 patients were taken. Both the groups implied male dominance i.e. 57.8% & 56.3% in both the groups respectively. Demographic profile such as age, weight, height & BMI was found significant. **Jindal R et al** [39] reported the prevalence of hypertension and its association with various risk factors a survey in Uttar Pradesh found a high prevalence of hypertension amongst people of Uttar Pradesh. Age, alcohol consumption, cholesterol levels act as independent risk-factors for hypertension.

Lipid profile was found significant as well in terms of Total Cholesterol & LDL. LDL was lower in Group I. In comparative study by **Gupta S et al** [40] reported that most asymptomatic cases with ECG changes had 5-10 year of duration of diabetes mellitus, 70% patients with ECG changes had poor glycaemic control, increased triglyceride and decreased High Density Lipoprotein (HDL) levels.

CONCLUSION

In Group I BMI>30 kg/m^2 patients were taken and in Group II BMI<30 kg/m^2 patients were taken. Both the groups implied male dominance i.e. 57.8% & 56.3% in both the groups respectively. Demographic profile such as age, weight, height & BMI was found significant.

Lipid profile was found significant as well in terms of Total Cholesterol & LDL. LDL was lower in Group I.

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