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Research Article

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Correlation of Overweight and Lipid Profile among Medical College Students at Jhalawar: A Cross Sectional Study

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ABSTRACT

Abstract: There has a long been proven relationship between obesity and dyslipidemia. Overweight and obesity are disorders of imbalance of energy affecting people of various age groups and socio–economic status. So, hereby we undertook this study to determine the frequency of obesity and its relationship with lipid profile among medical students. **Methodology**: In this cross sectional study, 300 MBBS students of JMC Jhalawar, Rajasthan in age group 17-30 years were enrolled from period of September 2021 to August 2022.Their height and weight and lipid profile were assessed by using standard methods and techniques. Moreover, on these subjects body mass index (BMI) was calculated and it's association with lipid profile was found. **Results**: Amongst 300 students, a total of 175(58.3%) were male and 125 (41.7%) were females. Among studied subjects, The prevalence of overweight and obesity was 85 (28.3%) and 10 (3.3%) respectively. Prevalence of Overweight in male and females was 50(16.7%) and 35(11.7%), in obese were 8(2.7%) in male and 2 (0.7%) in female, with more men affected than women. Finding of lipid profile includes mean triglycerides 114.83 ±26.09 mg/dl, total cholesterol 145.96 ±22.02 mg/dl, LDL 102.40 ±14.58 mg/dl, HDL Cholesterol 28.59 ± 9.90 mg/dl, VLDL 23.82 ± 7.95 mg/dl. Obesity was positively association with triglycerides and no. of hypertensive subjects (p<.05%) but showed negative association with total cholesterol, LDL, HDL, VLDL , SBP and DBP (p>.05%). **Conclusion**: Findings showed males are more prone to be obese and change in the lipid profile is also seen. Though not very significant for all parameters but more on increasing trend. So, Preventive strategies for obesity may offer an early and cost-effective approach towards lowering lipid level and related complications.

Key Words: *Obesity, overweight, Lipid profile, dyslipidemia*

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INTRODUCTION

Obesity, which is broadly defined as excess body weight for a given height, remains a continuing global health concern, as it is associated with increased risk of numerous chronic diseases including type 2 diabetes (T2D), hypertension, and cardiovascular disease (CVD). Body mass index (BMI) (weight in kg/height in m^2), the most widely used formula to define overweight (BMI 25 to 29.9 kg/m^2) and obesity (BMI ≥30 kg/m^2), while not being a true measure of adiposity, is simple to use in health screenings and epidemiological surveys. A recent analysis of data from 195 countries revealed that the prevalence of obesity has doubled in more than 70 countries since 1980, and over 600 million adults were obese in 2015, with high BMI accounting for 4 million deaths globally[1].

Lipid profile represents a combination of tests ordered entails total cholesterol and its fractions viz. low-density lipoprotein (LDL), high-density lipoproteins (HDL) and very low-density lipoprotein (VLDL), and triglycerides (TG) for the assessment of disorders of lipid metabolism and associated complications, particularly atherosclerotic cardiovascular disease (ASCVD). The burden of ischemic heart disease and cerebrovascular diseases is immense, and they contribute approximately to 84.5% of cardiovascular deaths and 24.2% of death from all causes[2]. These figures will continue to increase owing to a sedentary lifestyle and fat-rich food consumption. An LP entails total cholesterol and its fractions viz. low-density lipoprotein (LDL), high-density lipoproteins (HDL) and very low-density lipoprotein (VLDL), and triglycerides (TG).

Obesity and Dyslipidemia

Abnormalities in lipid metabolism are very commonly observed in patients who are obese. Approximately 60-70% of patients with obesity are dyslipidemic. The lipid abnormalities in patients who are obese include elevated serum triglyceride, VLDL, apolipoprotein B, and non-HDL-C levels[3].

The increase in serum triglycerides is due to increased hepatic production of VLDL particles and a decrease in the clearance of triglyceride rich lipoproteins. HDL-C levels are typically low and are associated with the increase in serum triglycerides. LDL-C levels are frequently in the normal range but there is an increase in small dense LDL.

Patients who are obese are at an increased risk of developing cardiovascular disease and therefore treatment of their dyslipidemia is often indicated. Weight loss will decrease serum triglyceride and LDL-C levels and increase HDL-C levels. In most patients the changes in lipid levels with weight loss are not very robust and is proportional to the change in weight.

The mixed dyslipidemia that is frequently observed in patients who are obese will often require combination therapy. However, recent studies have failed to demonstrate that adding fenofibrate or niacin to statin therapy provides additional benefits beyond statins alone. However, the addition of the omega-3-fatty acid, icosapentethyl, to statin therapy has been shown to decrease cardiovascular events[4].

Thus, the light of literature shows that how obesity is associated with many physiological and biochemical abnormalities including hypertension and serum lipid profile. There is lack of literature regarding medical students on these kind of parameters. As medical students have sedentary life style and food habits are not very good so chances of obesity, hypertension and altered lipid profile may be there and Due to change in above parameters, complications related to these may take place earlier. To avoid these changes and their further bad consequences, we under took this study to find out the prevalence of obesity and it's association with Blood Pressure and serum lipid profile among MBBS students. So, that the students can be sensitize to improve the quality of life.

MATERIAL AND METHODS:

The present study comprised of 300 MBBS Students of JMC jhalawar, Rajasthan, India of age group 17-30 years from period of September 2021 to August 2022 after the approval of the Ethical Committee. The design for this study was a cross sectional survey. Obesity was measured by BMI using formula Body weight (kg)/Height^2 (m^2) .

WHO Categories of BMI

Underweight	15–19.9
Normal weight	20–24.9
Overweight	25–29.9
Preobesity	
Class I obesity	30–34.9
Class II obesity	35–39.9
Class III obesity	≥40
Abbreviation: BMI, body mass index	

The blood samples were collected from the antecubital vein, after minimum 8 hrs fasting period and processed for lipid profile in standardized manner under set protocol in the Central Laboratory , SRG Hospital , Jhalawar Medical College, Jhalawar. Lipid profile was analyzed on XL-1000 biochemistry autoanalyzer by using serum.

Statistical Analysis:

Statistical analysis was done by using suitable online software statistically. Quantitative data was summarized in the form of MEAN ± SD. A statistics of (frequencies, percentages mean, and standard deviations) were performed. Chi-square test was done to evaluate the association with selected variable (gender) of the study with their likelihood of being with obese. The P value <.05 was taken as significant considered statistically significant.

OBSERVATION & RESULT

In total 300 MBBS students were included in this study.

Table No 1 : Distribution of Nutritional status according to Gender

		Status				Total	Chi sq	P value
		Underweight	Normal	Overweight	Obesity			
Gender	Female	21	67	35	2	125		
		16.8%	53.6%	28.0%	1.6%	100.0%	2.259	0.520
	Male	31	86	50	8	175		
		17.7%	49.1%	28.6%	4.6%	100.0%		
Total		52	153	85	10	300		
		17.3%	51.0%	28.3%	3.3%	100.0%		

Above table Shows underweight female 21 (16.8%), Normal female 67 (53.6%), overweight female 35 (28.0%), obese female 2 (1.6%)out of total 125 female whereas underweight male 31 (17.7%), Normal male 86 (49.1%), overweight male 50 (28.6%), obese male 8 (4.6%) out of total 175 male. The difference in nutritional status according to gender is not statistically significant(p>.05)

Table no. 2: Distribution of Descriptive Statistics

	Underweight	Normal	Overweight	Obesity
	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Age	20.29±1.56	20.45±1.41	20.88±1.95	19.60±1.17
BMI(kg/m2)	16.32±1.22	20.53±1.69	25.87±0.68	32.12±2.82
Triglycerides (mg/dl)	109.54±24.89	112.14±23.21	123.25±28.41	112.10±38.93
Cholesterol (mg/dl)	141.48±18.77	145.97±23.30	147.72±21.04	154.30±24.29
LDL(mg/dl)	99.48±15.91	103.96±13.21	100.53±15.74	109.70±13.66
HDL(mg/dl)	27.40±8.67	28.95±10.40	28.14±9.60	33.30±10.56
VLDL(mg/dl)	24.13±15.42	22.96±4.71	25.31±5.52	22.70±7.79

As shown in table the mean age of overweight was highest (20.88±1.95 yrs) among all BMI categories. BMI for obese and overweight were 32.12± 2.82 kg/m2 and 25.87±0.68 kg/m2 respectively. Triglycerides for obese 112.10±38.93 mg/dl, overweight 123.25±28.41 mg/dl, normal 112.14±23.21 mg/dl, underweight 109.54±24.89mg/dl. The difference is statistically significant (<.05%). Total Cholesterol for obese 154.30±24.29 mg/dl, overweight 147.72±21.04 mg/dl, normal 145.97±23.30 mg/dl, underweight 141.48±18.77 mg/dl. LDL for obese 109.70±13.66 mg/dl, overweight 100.53±15.74 mg/dl, normal 103.96±13.21 mg/dl, underweight 99.48±15.91mg/dl. LDL for obese 109.70±13.66 mg/dl, overweight 100.53±15.74 mg/dl, normal 103.96±13.21 mg/dl, underweight 99.48±15.91mg/dl and the difference for total cholesterol , LDL , VLDL, HDL are statistically not significant (>.05%).

DISCUSSION

Obesity is traditionally defined as a weight ≥20% above the ideal weight, which corresponds to the lowest death rate for individuals of a specific height, gender and age[5]. According to the World Health Organization (WHO), in 2005, approximately 1.6 billion adults over the age of 15 were overweight[6]. At least 400 million adults were considered obese and ≥20 million children under the age of 5 years were overweight. The estimation for the current year (2015) is approximately 2.3 billion overweight adults and over 700 million obese ones[7]. WHO defines 'globesity' as a worldwide epidemic of obesity that is currently on the increase. The situation is critical due to the fact that the diseases that can occur due to obesity are becoming increasingly prevalent, particularly cardiovascular diseases, currently the leading cause of mortality worldwide[8].

BMI does not measure body fat directly, but BMI is moderately correlated with more direct measures of body fat. Furthermore, BMI appears to be as strongly correlated with various metabolic and disease outcome as are these more direct measures of body fatness[9,10].

The medical field is a challenging and stressful profession. Stress is an important factor that causes diet deviation, or physical inactivates and addiction and hence it is a risk factor to obesity.

This was a cross sectional prevalence study, taken as a pilot project, done over a period of 12 months from september 2021 to august 2022 in the department of Physiology, Govt. Medical College and the Central laboratory hospital , Jhalawar (Raj.) . Study included 300 students of first MBBS, we observed more male subjects than females in our study. 41.7% female and 58.3% males observed in Table No. 1, which is in accordance with the previous studies. This may be due to higher family income, perceived life stress, home region GDP, and university city unemployment

were associated with higher overweight and obesity levels in males, independent of other individual- and city-level covariates or may be bias result due to less female enrollment of female in study subject . We found that this difference is not significant[11].

Above table is showing the Nutritional status according to Gender in our study . It Showed underweight female 21 (16.8%), Normal female 67 (53.6%), overweight female 35 (28.0%), obese female 2 (1.6%)out of total 125 female whereas underweight male 31 (17.7%), Normal male 86 (49.1%), overweight male 50 (28.6%), obese male 8 (4.6%) out of total 175 male. The difference in nutritional status according to gender was not statistically significant($p>.05$). The current results reported that the prevalence of obesity was higher among males. (4.6% in male, 1.6 % in female).This is agreed with other studies in terms of the high prevalence of obesity among male medical students. Also, a study in Greece showed that 40% of males and 23% of female students had a BMI of $\geq$25.0 kg/m^2[12]. A study in Slovakia showed that 16% of males but only 2% of female medical students had a BMI >25.0 kg/m^2[13]. In contrary, Al Rashdan *et al*[14] and Ng SW[15] Rasheed P *et al*[16], reported that overweight and obesity were higher among females compared to males students. These observed difference in gender obesity and overweight may be related to a complex multifactorial influence.

Table no 2 is showing the distribution of lipid profile parameters. We found serum triglyceride levels significantly increased in obese and preobese students than normal and underweight students. According to a study of Obesity in Spanish School children: Relationship with Lipid Profile and Insulin Resistance, When comparing the lipid profile between obese and non-obese children, they observed that, in both sexes, obese children had significantly higher triglyceride levels than non-obese children[17]. The findings of our study are also almost similar in which obese subjects are having higher triglycerides level. It was observed that the total triglycerides concentrations is higher in obese. Present study showed statistically significant higher values of Serum Triglycerides in obese individuals. The parameters other than Triglyceride like Total cholestesterol, LDL, HDL & VLDL are not significant. Previous studies shown significant results for the above parameters[17,18]. The reason for this difference may be the variability in sample size.

CONCLUSIONS

The study showed a high prevalence of overweight and obesity among health science college students. The prevalence were significantly higher among male participants. It's association with hypertension is significant. Serum triglyceride showed significant association with obesity. It is concluded that medical students should be screened for obesity and lipid profile along with dietary advice, implementation of life style modification, and pharmacological intervention if needed. Overweight and obese students were advised to do regular exercise, modify their life style and dietary habits to prevent obesity related complications.

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