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FREQUENCY OF DYSLIPIDEMIA IN OBESE ADULT PATIENTS PRESENTING AT SAIDU GROUP OF TEACHING HOSPITAL

Original Research

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ABSTRACT

Background: Obesity has become a global epidemic and is strongly associated with a range of metabolic disturbances, particularly dyslipidemia, which significantly increases the risk of cardiovascular disease (CVD). Despite its growing prevalence, data on the burden of dyslipidemia among obese adults in local healthcare settings of Pakistan remains scarce.

Objective: To determine the frequency of dyslipidemia among obese adult patients presenting at Saidu Group of Teaching Hospital, Swat.

Methods: A cross-sectional study was conducted over six months at the Department of Medicine, Saidu Group of Teaching Hospital. A total of 135 obese adults (BMI > 30 kg/m²), aged 18–60 years, were selected through consecutive non-probability sampling. Patients with comorbidities or on lipid-lowering medication were excluded. Lipid profiles were assessed based on standard dyslipidemia criteria. Data were collected through structured proformas and analyzed using IBM SPSS v.23. Frequencies, percentages, and chi-square tests were applied, with $p < 0.05$ considered statistically significant.

Results: Among the 135 participants, the mean age was 42.6 years, and the mean BMI was 33.4 kg/m². Dyslipidemia was present in 77.8% of patients. Elevated triglycerides (81.5%), reduced HDL cholesterol (75.6%), total cholesterol > 200 mg/dL (70.4%), and high LDL levels (64.4%) were the most common abnormalities. Urban residents, unemployed individuals, and smokers exhibited a higher prevalence.

Conclusion: A substantial proportion of obese adults exhibited dyslipidemia, highlighting the need for routine lipid screening and early intervention strategies to reduce the risk of cardiovascular complications in this population.

Keywords: Adult, Body Mass Index, Cardiovascular Diseases, Cholesterol, Cross-Sectional Studies, Dyslipidemias, Obesity.

INTRODUCTION

Obesity has emerged as a global health crisis, initially gaining traction in the United States before expanding into Europe and other high-income nations, and is now increasingly prevalent in urban centers of developing countries (1). This growing epidemic poses a serious public health threat due to its well-established association with a wide spectrum of chronic conditions, including cardiovascular disease (CVD), type 2 diabetes mellitus, hypertension, dyslipidemias, stroke, osteoarthritis, sleep apnea, and certain forms of cancer (2). Among these, the cardiovascular implications of obesity have drawn significant clinical attention, particularly due to their impact on global morbidity and mortality. A strong pathophysiological link exists between obesity and atherogenic dyslipidemia, a lipid disorder characterized by elevated levels of total cholesterol, low-density lipoprotein (LDL) cholesterol, triglycerides, and small dense LDL particles, alongside reduced levels of high-density lipoprotein (HDL) cholesterol (3,4). These alterations in lipid metabolism play a critical role in the progression of atherosclerosis and the increased cardiovascular risk observed in obese individuals. While traditional risk factors such as diabetes and hypertension have been extensively studied in relation to abnormal lipid profiles (5), obesity itself is now recognized as an independent and quantifiable risk factor for cardiovascular events (6).

Despite the growing burden of obesity and its associated metabolic consequences, both obesity and dyslipidemia remain underdiagnosed and undertreated conditions in many clinical settings (7). This oversight limits the effectiveness of cardiovascular risk assessment and delays preventive interventions that could substantially reduce adverse outcomes. Cardiovascular diseases continue to be the leading cause of death worldwide, and a multidimensional approach to risk factor evaluation is essential to curb this trend (8-10). In this context, addressing obesity and dyslipidemia through early detection and lifestyle modification is paramount. Preventing these conditions across all age groups is key to reducing long-term cardiovascular morbidity and mortality. Alarmingly, studies indicate that the prevalence of dyslipidemia in obese patients can be as high as 78%, yet regional data on this issue remain sparse (11-13). Particularly in local healthcare settings such as Saidu Group of Teaching Hospital, there is a critical lack of updated epidemiological data that could inform targeted screening and prevention strategies. Therefore, this study is designed to fill this gap by determining the frequency of dyslipidemia among obese adult patients presenting at Saidu Group of Teaching Hospital. The findings are expected to support the development of early screening protocols and promote healthy lifestyle interventions, ultimately contributing to a reduction in cardiovascular morbidity and mortality in the region.

METHODS

This cross-sectional study was conducted in the Department of Medicine at Saidu Group of Teaching Hospital, Swat, over a minimum period of six months following approval of the research synopsis by the institutional ethical review board of CPPS Karachi. Ethical approval was obtained, and informed written consent was secured from all participants prior to inclusion. The study aimed to determine the frequency of dyslipidemia in obese adult patients, using a sample size of 135, calculated via the WHO sample size calculator with an assumed prevalence of dyslipidemia of 78% (9), 7% absolute precision, and 95% confidence level. Participants were selected using consecutive non-probability sampling. Adult male and female patients aged 18 to 60 years with a body mass index (BMI) greater than 30 kg/m², as per the operational definition of obesity, were eligible for inclusion. Exclusion criteria included patients currently taking lipid-lowering medications, as well as those with documented cardiac, renal, or hepatic disease, and patients with known hypertension or diabetes mellitus, as these conditions could confound lipid profile results and affect the accuracy of the study outcomes.

Patients who met the inclusion criteria underwent a structured data collection process. The purpose, benefits, and potential risks of the study were explained to all participants prior to obtaining informed consent. Demographic data, including age, gender, and residential address, were recorded. Participants were then subjected to clinical assessment and physical examination. Obesity was confirmed through BMI measurement (weight in kilograms divided by height in meters squared), and screening for dyslipidemia was conducted according to pre-defined biochemical criteria: total cholesterol > 200 mg/dL, triglycerides > 150 mg/dL, LDL cholesterol > 130 mg/dL, and HDL cholesterol < 40 mg/dL (14,15). All assessments were performed under the supervision of a consultant physician with a minimum of five years of post-fellowship experience to ensure accuracy and consistency. Data were collected using a structured proforma and analyzed using IBM SPSS version 23. Continuous variables such as age, weight, height, and BMI were expressed as mean

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± standard deviation. Categorical variables including gender, residence (urban/rural), smoking history, employment status, and presence of dyslipidemia were presented as frequencies and percentages. To control for confounding, stratification was performed for variables such as gender, age, BMI, occupation status, smoking history, and area of residence. Post-stratification chi-square tests were applied to assess statistical significance, with a p-value of less than 0.05 considered significant. Final results were tabulated for clarity and interpretation.

RESULTS

A total of 135 obese adult patients were included in this study. The mean age of participants was 42.6 years, and the average BMI was calculated to be 33.4 kg/m². Among the participants, 77 (57%) were male, and 58 (43%) were female. With regard to socioeconomic status, 70 patients (51.9%) belonged to the middle class, while 48 (35.6%) were from the lower class and 17 (12.6%) from the upper class. Most participants were employed (n=85, 62.9%) compared to 50 (37.1%) who were unemployed. In terms of residence, 79 (58.5%) were from urban areas and 56 (41.5%) from rural regions. A majority of the patients were educated (n=90, 66.7%), and 45 (33.3%) were uneducated. Smoking history was positive in 40 patients (29.6%) and negative in 95 (70.4%). Regarding lipid profile parameters, elevated serum total cholesterol levels (>200 mg/dL) were observed in 95 (70.4%) patients. High triglyceride levels (>150 mg/dL) were detected in 110 patients (81.5%). Elevated LDL cholesterol (>130 mg/dL) was seen in 87 participants (64.4%), while decreased HDL cholesterol levels (<40 mg/dL) were found in 102 patients (75.6%). Overall, 105 patients (77.8%) met the criteria for dyslipidemia, while 30 patients (22.2%) did not. These findings indicate a substantial burden of dyslipidemia among obese adults in the study population. The lipid abnormalities observed were consistent with atherogenic dyslipidemia patterns typically associated with obesity.

Table 1: Demographic Characteristics of Study Participants (n=135)

Variable	Frequency (%)
Mean Age (years)	42.6
Gender	
Male	77 (57.0%)
Female	58 (43.0%)
Mean BMI (kg/m²)	33.4
Socioeconomic Status	
Lower	48 (35.6%)
Middle	70 (51.9%)
Upper	17 (12.6%)
Occupation Status	
Employed	85 (62.9%)
Unemployed	50 (37.1%)
Residence	
Rural	56 (41.5%)
Urban	79 (58.5%)
Education	
Educated	90 (66.7%)
Uneducated	45 (33.3%)
Smoking History	
Yes	40 (29.6%)
No	95 (70.4%)

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Table 2: Lipid Profile Abnormalities in Obese Patients

Lipid Parameter	Abnormal Value Criteria	Frequency (%)
Total Cholesterol	> 200 mg/dL	95 (70.4%)
Triglycerides	> 150 mg/dL	110 (81.5%)
LDL Cholesterol	> 130 mg/dL	87 (64.4%)
HDL Cholesterol	< 40 mg/dL	102 (75.6%)

Table 3: Dyslipidemia Prevalence in Study Population

Dyslipidemia Status	Frequency (%)
Present	105 (77.8%)
Absent	30 (22.2%)

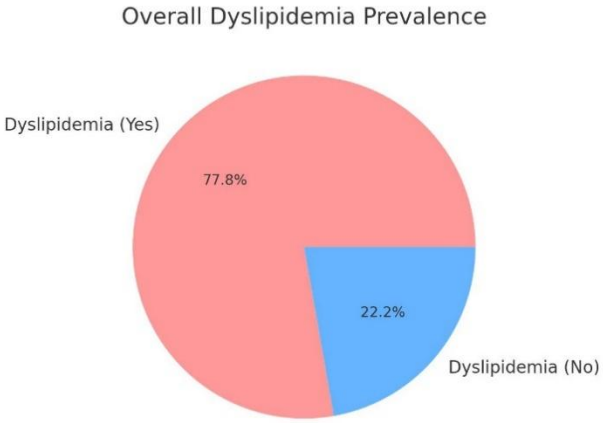

Figure 1 Overall Dyslipidemia Prevalence

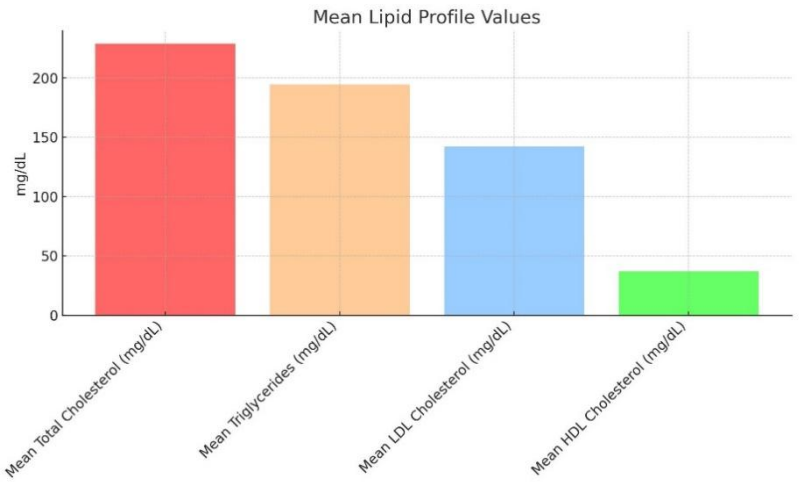

Figure 2 Mean Lipid Protein Values

DISCUSSION

The findings of this study reinforce the well-documented and growing concern surrounding dyslipidemia in obese populations. With a dyslipidemia prevalence of 77.8% among obese adult patients at Saidu Group of Teaching Hospital, the results align closely with prior regional and international data. A similar cross-sectional study reported a dyslipidemia prevalence of 78% in apparently healthy obese adults, with HDL-C reduction being the most common lipid abnormality (16). In the present study, decreased HDL-C and elevated triglycerides were also frequently observed, underscoring a consistent atherogenic dyslipidemic pattern among obese individuals across different populations. Several mechanisms may explain these findings. Obesity is known to disrupt normal lipid metabolism through mechanisms such as insulin resistance, altered adipokine production, and increased free fatty acid flux from adipose tissue to the liver. These alterations result in increased synthesis of very-low-density lipoprotein (VLDL), higher triglyceride levels, and reduced HDL cholesterol levels. These metabolic disturbances are not merely biochemical abnormalities but serve as precursors for a cascade of cardiovascular events. A multi-country cross-sectional study also observed a strong association between obesity and dyslipidemia, particularly in populations experiencing rapid urbanization and lifestyle transitions (17-19).

The prevalence reported in this study exceeds those seen in some high-income countries. For instance, a study found a dyslipidemia prevalence of 50% in individuals over 40 years, although with wide variations across risk strata (20). This disparity may be explained by differences in genetic predisposition, dietary habits, physical activity, and access to early screening and healthcare services. Dyslipidemia's role in the pathogenesis of diabetes is increasingly acknowledged. A large-scale study found that obesity and dyslipidemia combined significantly elevated the risk of diabetes, with odds ratios exceeding 4.0 (21). The metabolic overlap among obesity, dyslipidemia, and other non-communicable diseases reflects a multifaceted health crisis. It underscores the need for early

preventive strategies and lifestyle interventions in clinical and community settings alike. Despite the relevance of the findings, the study was not without limitations. First, its cross-sectional nature precludes any inference of causality. Second, the exclusion of patients with diabetes or hypertension—common comorbidities in obesity—limits the generalizability of the findings to the broader obese population. Moreover, the use of non-probability sampling may introduce selection bias, thereby restricting the external validity. Another limitation is the lack of data on dietary intake, physical activity levels, and genetic predisposition, which are influential in lipid regulation.

Nevertheless, the study presents several strengths. It used clearly defined operational criteria for obesity and dyslipidemia and was conducted under the supervision of experienced clinicians, ensuring procedural rigor. The findings also address a significant gap in regional data, contributing valuable insight into a population that is often underrepresented in epidemiological studies. Further research is warranted to explore longitudinal outcomes associated with dyslipidemia in obese individuals, particularly those who are asymptomatic. Future studies should consider a larger and more diverse sample, including patients with comorbid conditions, to reflect real-world scenarios more accurately (22,23). Integrating dietary, genetic, and behavioral variables would also offer a more comprehensive understanding of the complex interactions driving lipid abnormalities in obesity. The clinical implications of this study are far-reaching. Routine lipid profiling should become a standard part of obesity management, even in the absence of overt comorbidities. Public health efforts must emphasize early screening, lifestyle modification, and targeted education to reduce the burden of cardiovascular disease attributable to dyslipidemia in obese populations.

CONCLUSION

This study demonstrated a high prevalence of dyslipidemia among obese adults, emphasizing the urgent need for routine lipid screening and early lifestyle interventions in this population. The findings highlight obesity as a critical and independent risk factor for cardiovascular disease, reinforcing the importance of integrated prevention strategies in clinical practice to reduce future morbidity and mortality associated with lipid abnormalities.

AUTHOR CONTRIBUTION

Author	Contribution
Nasar Khan*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Muhammad Ayub Khan	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published

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