Prevalence of Abnormal Lipid Profile Among Obesity People Mogadisho, Somalia

ABSTRACT

Background: A lipid profile includes total cholesterol, high-density lipoprotein (HDL) cholesterol, triglycerides, and calculated low-density lipoprotein (LDL) cholesterol. Obesity is defined as excess body weight, and dyslipidemia is abnormal blood concentrations of total cholesterol, LDL cholesterol, HDL cholesterol, and triglycerides. HDL carries only one-third to one-fourth of blood cholesterol, while triglycerides store excess energy. **Objective:** the aim of this study was to find out the prevalence of abnormal lipid profile among obesity people in Mogadishu Somali. **Materials and Methods:** a cross- sectional study was performed at selected hospitals. A total of 150 participants was enrolled in this study. 4 ml of venous blood sample was collected from each participant after taking informed written consent from the participants.Serum level of lipid profile test will be measured by using (AOUTUMATED CHEMISTRY MACHINE) techniques to evaluate lipid profile test status. Data analysis was done with statistical package for data analysis (spss). **Results:** Among the of 150 participants the predominant age group was 20-30 years (42.7%), followed age group 31- 40 years 20%, and >50 years 20.7%. There was also age groups of 41-50 years (16.7%). According to their level of obesity, out of the 150 participants, 104(69.3%) were class I obesity 25-29.9BMI, 36(24%) were class II obesity 30-35BMI and the last 10(6.7%) were class III obesity >35BMI. In our study, according to laboratory diagnosis, maximum respondents were normal 58(38.7%) followed by 51(34%) were on the border line (HDL<43.7 mg/dl) and 41(27.3%) were abnormal. **Conclusion:** The data concluded that the majority of the participants were normal, and also there was abnormal and border line. wedo statistically significant, we have found that there's association between abnormal lipid profile and obesity level where the p-value was 0.006.

Keywords: Lipid Profile, Obesity, Somalia, Dyslipidemia**.**

INTRODUCTION

Lipid profile a pattern of lipids in the blood. A lipid profile usually includes the levels of total cholesterol, high-density lipoprotein (HDL) cholesterol, triglycerides, and the calculated low-

density lipoprotein (LDL) cholesterol. Obesity is defined as having an excess of body weight. A World Health Organization (WHO) release defined obesity as achronic disease increasing globally replacing traditional health concerns. It is directly related to cardiovascular problems and children whose parents are cardiovascular patientstend to have higher weight in the childhood and develop obesity as adults. Coronary heartdisease (CHD) has been estimated to become the leading cause of death in developing countries by 2020[1,2].

Obesity prevalence increased significantly between 1976 and 1994, correlated with global trends. Upper body or visceral obesity is a serious public health issue, linked to cardiovascular dysmetabolic syndrome, a combination of risk factors including dyslipidemia, insulin resistance, and hypertension, which is a significant public health problem[2]. Riches' study found that obese men have higher fasting cholesterol, triglycerides, glucose, insulin and dietary fat levels. Elevated hepatic VLDL apoB100 levels correlate with visceral obesity and insulin resistance. This leads to increased VLDL remnants, hepatic lipoprotein lipase activity, and conversion to LDL and IDL particles[3,4]. A study examining serum levels of lipids, lipoproteins, and lipid metabolizing enzymes in Finnish twin cohorts found a genetic component to alteration in lipoprotein metabolism in visceral obesity. Obese co-twins showed a 20% increase in LDL cholesterol, a 20% decrease in HDL2 cholesterol subfraction, and a significant increase in total cholesterol, VLDL, and LDL triglyceride. Obesity exacerbated hyperglycemia, hyperinsulinemia, and elevated blood pressure in an FCH background[5,6]. Lipoproteins, including cholesterol, are transported to tissues in the form of chylomicrons (CM), low density lipoproteins (LDL), and high density lipoproteins (HDL). They are hydrophobic and transport excess fatty acids (FA) into triacylglycerols, packaged into very low density lipoprotein (VLDL) and apo proteins[7].

Pakistan, a country with a unique ethnicity, has a high prevalence of metabolic disorders, including obesity and heart problems. The modernization of lifestyles and transportation, combined with a unique ethnicity, have led to lipid abnormalities, often hyperlipidemia. This study investigates lipid profile patterns in obese and cardiovascular disease (CHD) patients in Pakistani subjects, highlighting the importance of lipid traits in nutritional disorders development[8]. The risk of metabolic syndrome in Asia has increased significantly, posing a significant health challenge and posing a significant risk of mortality[9]. The Working Group on Obesity in China (WGOC) recommends a BMI cut off of 24 kg/m2 for overweight and 28 kg/m2 for obesity due to evidence

suggesting Chinese adults have a higher risk of metabolic syndrome and other risk factors for metabolic and cardiovascular disease, including insulin resistance, dyslipidemia, and increased visceral adipose tissue[10]. The International Obesity Task Force (IOTF) has highlighted the global prevalence of overweight children, with 1 in 10 children affected, accounting for 2-3% of the world's children aged five to 17 years[11].

Obesity is a growing issue in low and middle income countries, particularly in urban settings like Nigeria. Studies show a high prevalence of overweight and obesity in children, with rates ranging from 0.84% to 11.3%. Obesity is influenced by genetic, metabolic, cultural, environmental, socio-economic, and behavioral factors. Obesity in older children is a predictor of adult obesity and increases mortality from coronary heart disease. The mechanisms relating to obesity to cardiovascular risk are not clearly defined, but hyperlipidemia and hypertension form the insulin resistance syndrome[12]. There for there is no published data regarding the status of the prevalence of Abnormal Lipid Profile Among obesity people in Somalia. income countries, particularly in urban settings like Nigeria. Studies show a high prevalence of overweight and obesity in children, with rates ranging from 0.84% to 11.3%. Obesity is influenced by genetic, metabolic, cultural, environmental, socio-economic, and behavioral factors. Obesity in older children is a predictor of adult obesity and increases mortality from coronary heart disease. The mechanisms relating to obesity to cardiovascular risk are not clearly defined, but hyperlipidaemia and hypertension form the insulin resistance syndrome[13-16]. There for there is no published data regarding the status of the prevalence of Abnormal Lipid Profile Among obesity people in Somalia.

MATERIALS AND METHODS

Study settings and Study Population

This study was descriptive cross sectional study design. It was use quantitative data collection method to find out the Abnormality of lipid profile among obesity people. The target population for this study was obese people. This study was conduct at Hodan district Specially (Jazeera university hospital, Jazeera University Campus one and Shaafi Specialist Hospital) Mogadishu Banadir Somalia. The study was carried out from March to September 2023. The study was

including only 150 samples. Among them 95 (63.3%) of the respondents were female, while 55 (36.7%) of the respondents were male

Blood sample collection and Laboratory Analysis

This study was used gloves, tubes, maker pen, allergic machine, Centrifuge, paster Pipette. We are using serum a venous blood sample is collected aseptically without additives. Indicate the centrifugation or the presence of fibrin or particulate matter in the sample may cause an erroneous result. Inspect all samples for air bubbles and foaming. Remove any air bubbles prior to assay. Samples may be stored at 2-8c for up to 7 days prior to analysis. The sample required for analysis is 100 ul. Laboratory analysis were done in diagnostic centers Mogadishu Banadir Somalia.

Operational Definition

Dyslipidemia National Cholesterol Education Programme (NCEP) guidelines were used for definition of dyslipidemia as follows Hypercholesterolemia – serum cholesterol levels ≥200 mg/ dl (≥5.2 mmol/l). Hypertriglyceridemia – serum triglyceride levels ≥150 mg/ dl(≥1.7 mmol/l). Low HDL cholesterol – HDL cholesterol levels <40 mg/dl (<1.04 mmol/l)for men and <50 mg/dl (<1.3 mmol/l) for women. High LDL cholesterol – LDL cholesterollevels ≥130 mg/dl (≥3.4 mmol/l) calculated using the Friedewald equation. High total cholesterol to HDL-C Ratio This is defined as a total cholesterol to HDL-C ratio of ≥4.5[17].

Data collection

Questionnaire was open-ended questions was administered to every study A participant. Researcher was getting an authority letter from the faculty of Health Science of Jazeera University, Somalia to make the authorization of carrying out research about ― Prevalence of Abnormal Lipid Profile Among Obesity People. Questionnaire and investigation (Sample Testing) was used as the main instrument for collecting patient socio-demographic profile.

Data Analysis

All collected data was analyzed using statistical package for social science software (SPSS version 20). Data analysis began with descriptive analysis. Means with standard deviations was calculated for continuous variables while frequencies and percentages were calculated for Categorical variables.

RESULTS

Out of the 150 participants in this study, more than half 95(63%) were female while the remaining 55 (36.7%) were male. The predominant age group was 20-30 years (42.7%), followed age group 31-40 years 20%, and >50 years 20.7%. There was also age groups of 41-50 years (16.7%). Out of the 150 participants in this study, more than half 92(61.3%) were married while the remaining 58 (38.7%) were single. Nearly half 74(49.3%) were bachelor, followedby secondary level 34(22.7%), and the least were master degree 24(16%) and illiterate 18(12%). According to the below table, out of the 150 participants, 54 (36%) were unemployed,52 (34.7%) were soft work and the last 44(29.3) were hard workers (Table 1).

Table 1: Distribution of the study subjects on the basis of Demographic characteristics (n=150)

Parameters	Frequency (%)
Gender	
Male	55 (36.7)
Female	95 (63.3)
Age Group	
20-30 years	64 (42.7)
31-40 years	30 (20.0)
41-50 years	25 (16.7)
Above 50 years	31 (20.7)
Marital status	
Married	58 (38.7)
Unmarried	92 (61.3)

Level of education	
Illiterate	18 (12)
Secondary	34 (22.7)
Bachelor	74 (49.3)
Master degree	24 (16.0)
Occupation	
Soft work	52 (34.7)
Hard work	44 (29.3)
Unemployment	54 (36.0)

Among 150 subjects included in this study, the majority selected not tested lipid profile 109(72.7%)the remaining 41(27.3%) selected yes. The majority selected no family history 93(62%) the remaining 57(38%) selected they have family history of hyperlipidemia. According to their level of obesity, out of the 150 participants, 104(69.3%) were class I obesity 25-29.9BMI, 36(24%) were class II obesity 30-35BMI and the last 10(6.7%) wereclass III obesity >35BMI. The majority were obesity 89(59.3%) the remaining 61(40.7%) were physical inactivity (Table 2).

Table 2: Distribution of the study subjects on the basis of clinical characteristics (n=150)

Parameters	Frequency (%)
Have you ever been tested lipid profile	
Yes	41 (27.3)
No	109 (72.7)
Family history of hyperlipidemia	
Yes	57 (38.0)
No	93 (62.0)
Obesity level BMI	
class I obesity 25-29.9 BMI	104 (69.3)
class II obesity 30-35 BMI	36 (24.0)
class III obesity >35 BMI	10 (6.7)
Risk group of dyslipidemia	
Obesity	89 (59.3)
physical inactivity	61 (40.7)

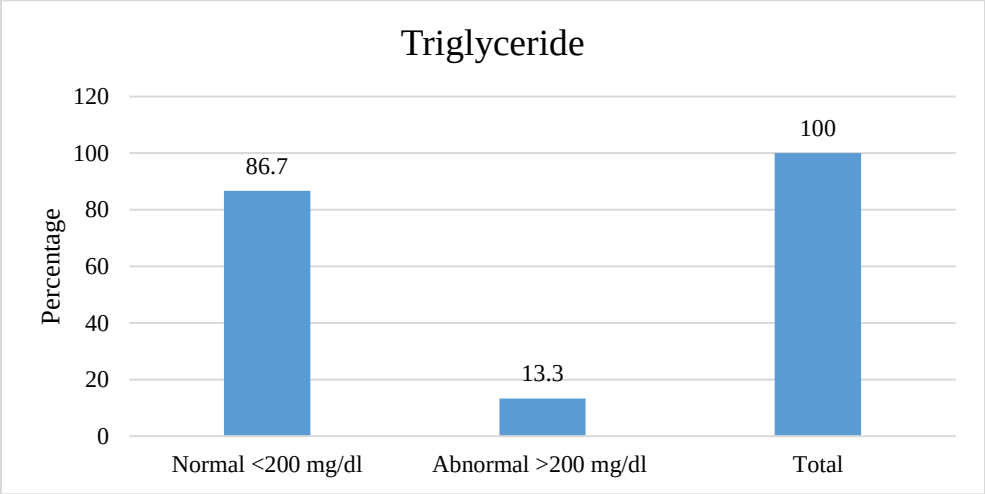

Figure 1: Distribution of the study subjects on the basis of triglyceride

Among 150 subjects included in this study on the basis of triglyceride, the majority were normal 130(86.7%) the remaining 20 (13.3%) were abnormal (Figure 1).

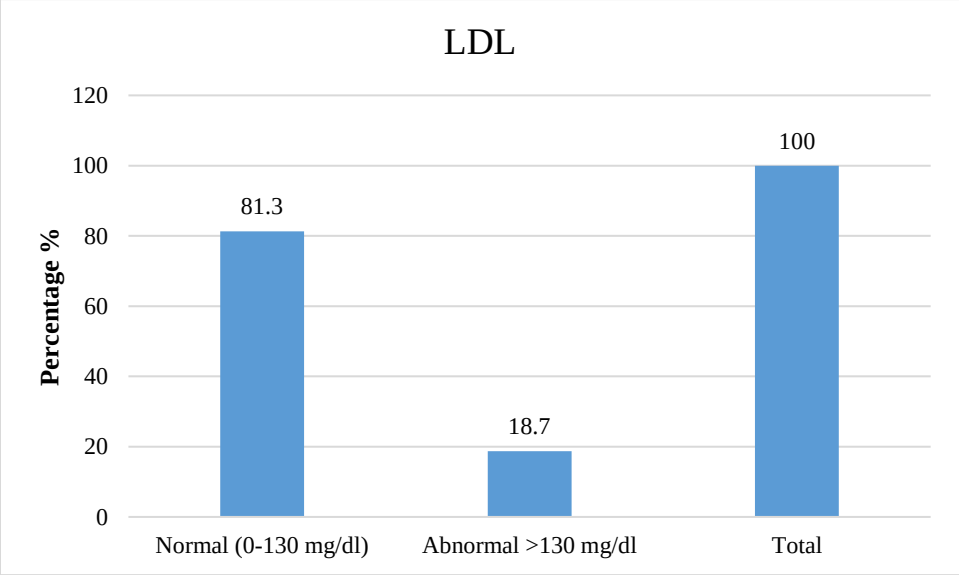

Figure 2: Distribution of the study subjects on the basis of LDL.

Among 150 subjects included in this study on the basis of LDL, the majority were normal 122 (81.3%) the remaining 28(18.7%) were abnormal (Figure 2).

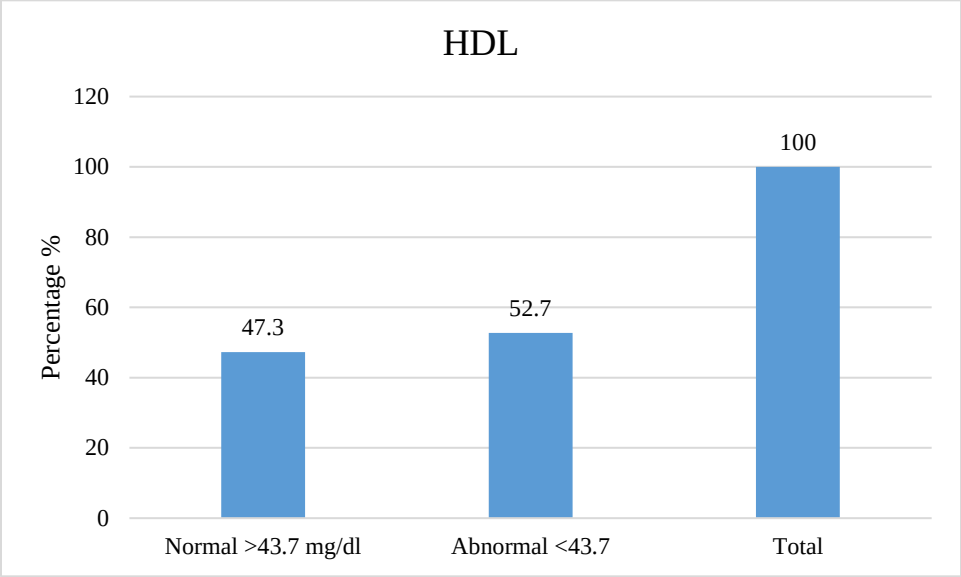

Figure 3: Distribution of the study subjects on the basis of HDL

Among 150 subjects included in this study on the basis of HDL, the majority wereabnormal 79 (52.7%) the remaining 71 (47.3%) were normal (Figure 3).

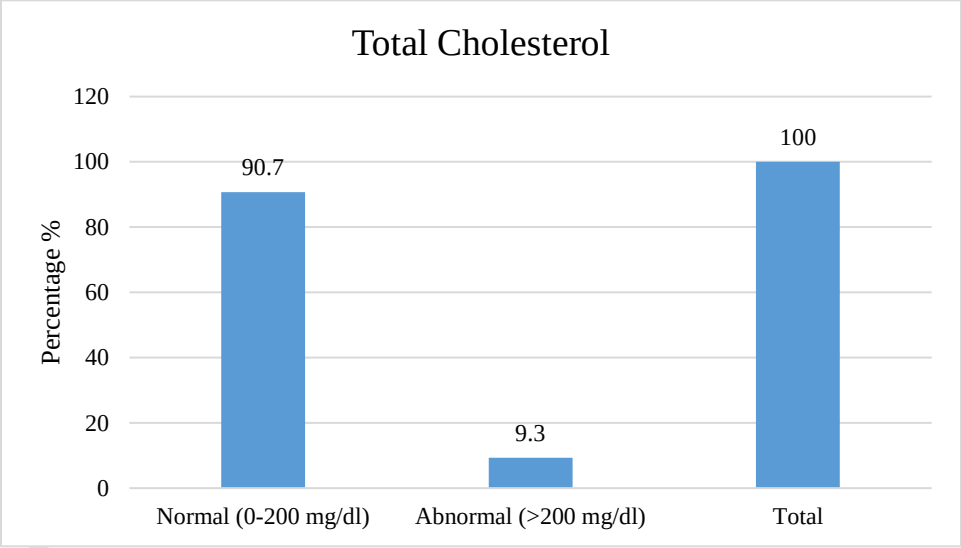

Figure 4: Distribution of the study subjects on the basis of total cholesterol

Among 150 subjects included in this study on the basis of total cholesterol, the majoritywere normal 136 (90.7%) the remaining 14(9.3%) were abnormal (Figure 4).

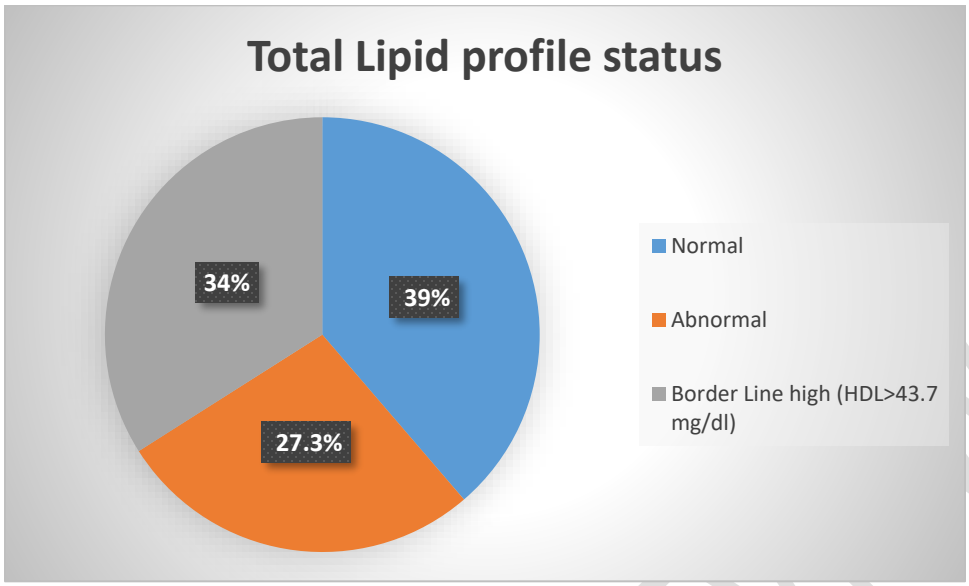

Figure 5: Distribution of the study subjects on the basis of lipid profile status

Among 150 subjects included in this study on the basis of overall lab result test of all lipidprofile, the majority were normal 58(38.7%), 41(27.3%) were abnormal an the last 51(34%) were on the border line (HDL <43.7 mg/dl).

Table 3: Associations between abnormal lipid profile and obesity level by using Chi- square (P-value)

	Distribution of the study subjects on the basis of lab result test of lipid profile			**Total**	Chi-Square (P – value)
	Normal	**Abnormal**	**Border line (HDL<43.7mg/dl)**		
Class I Obesity (25-29 years)	**46** (79.3%)	**20** (48.8%)	**38** (74.5%)	**104** (69.3%)	14.547 **(0.006)**
Class II Obesity (30-35 years)	**10** (17.2%)	**18** (43.9%)	**8** (15.7%)	**36** (24.0%)	
Class III Obesity >35 years	**2** (3.4%)	**3** (7.3%)	**5** (9.8%)	**10** (6.7%)	
Total	**58**	**41**	**51**	**150**	

	(38.6%)	(27.3%)	(34.0%)	(100.0)	

Chi square test e fisher exact test was performed to calculate significant statisticalassociation. $P < 0.05$ was considered as level of statistical significance.

Within the BMI status of the respondents who were in class I obesity were normal 46 (79.3), 20 (48.8%) were abnormal, and 38 (74.5%) were border line The similar pattern was observing in respondent who had class II obesity most of them were abnormal 18 (43.9%)and class III obesity were also border line. To see the differences, we did a chi square test.The distribution showed statistical significant difference (P =0.006) between abnormal lipid profile and obesity (Table 3).

DISCUSSION

Imbalance of lipid including (LDL) and (HDL) can increase the risk of cardiovascular events, including myocardial infarction and stroke. Elevated LDL-C can lead to a buildupof plaques within the arteries and is associated with an increased risk of atherosclerotic cardiovascular disease (ASCVD). including coronary artery disease[18],

Dyslipidaemia is defined as the presence of abnormal blood concentrations of one or moreof the following: total cholesterol, LDL cholesterol, HDL cholesterol, and triglycerides[19]. Obesity is defined as having an excess of body weight. HDL carries LDL (bad) cholesterol away from the arteries and back to the liver, where the LDL is broken down and passed from the body. But HDL cholesterol doesn't completely eliminate LDL cholesterol[20]. Only one-third to one-fourth of blood cholesterol is carried by HDL. Triglycerides are the most common type of fat in the body. They storeexcess energy from your diet. The remainders of the studies of interest were conducted in Mozambique, Zambia, Senegal, Uganda, Togo, and Malawi[21]. The highest prevalence of dyslipidemia was reported in a study from South Africa (89.9%), and from Kenya (85.6%). On the otherhand, the lowest prevalence of dyslipidemia of 5.2% was reported in a study from Ethiopia. The highest percentage of LDL-C data was reported in a study from Ethiopia(79.7%)[22,23]. The prevalence of obesity across Asia has increased rapidly over the last two decades. This has become a major health challenge, given the associated elevated risk of disease,including type-2 diabetes mellitus, hypertension, metabolic syndrome, and an increasedrisk of mortality. About 13% of the world's adult population (11% of men and 15% of women) were obese in 2016[24-27].

Among the of 150 participants the predominant age group was 20-30 years (42.7%), followed age group 31-40 years 20%, and >50 years 20.7%. There was also age groups of41-50 years (16.7%). In our study, according to laboratory diagnosis, maximum respondents were normal 58(38.7%) followed by 51 (34%) were on the border line (HDL <43.7 mg/dl) and 41(27.3%)were abnormal. According to their level of obesity, out of the 150 participants, 104(69.3%) were class I obesity 25-29.9BMI, 36(24%) were class II obesity 30-35BMI and the last 10(6.7%) wereclass III obesity >35BMI through findings were no statistically significant, we have found that there's significant association between abnormal lipid profile and obesity. Also we done family history of

hyperlipidemia of the respondents according to their family history of hyperlipidemia where about the majority 93(62%) of respondents had stated that they have no family history of hyperlipidemia while the remaining 57(38%) of the respondents had claimed to have family history of hyperlipidemia.

CONCLUSION

The data concluded that the majority of the participants were normal, and also there was abnormal and border line. we do statistically significant, we have found that there's association between abnormal lipid profile and obesity level.

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