

# Prevalence of Dyslipidemia in Obese patients in Jazan

Mohammad Othman Abu Omrain, Asma abdullah alazwari, Munira Abdullah Alhashim,

Taef Hassan Abdullah Al-Hussan, Ala'a atef ismail, Fatimah hamad s alfeheid,

Mariam Obaid Alenezi, Samah Mohammed AlQurashi, Abdullah Abdulatif Allahiany,

Abdulrahman Abdullah M Alghamdi, Yasser Ali Doshi,

## **Abstract**

### **Background:**

Dyslipidemia prevalence increases all over the world and it became a public health problem. Dyslipidemia is associated with several complications including cardiovascular diseases and atherosclerosis. Obesity can result in development of dyslipidemia as a result of increasing in lipid concentration in the blood.

### **Aim:**

To estimate the prevalence of dyslipidemia among obese patients.

### **Methods:**

This study is a retrospective study which was conducted on 436 individuals, the data were collected from a Primary Care Center in Jazan. The data were entered in excel sheet then analyzed by SPSS program.

### **Results:**

Normal individuals represented 73.4%, overweight represented 15.6% and obese patients represented 11% among all participants. The highest mean level of LDL

(164.5) and triglycerides (169.25) were significantly ( $P$ -value $<0.001$ ) associated with obesity, while the lowest level of HDL (29.5) was significantly ( $P$ -value $<0.001$ ) associated with obesity. Hyper LDL, Hyper triglyceride and low HDL were prevalent in 100% of obese patients.

### **Conclusion:**

Dyslipidemia is associated with obesity and it was prevalent in 100% of obese patients.

**Keywords: Dyslipidemia prevalence, Dyslipidemia and obesity, Saudi Arabia, Dyslipidemia in KSA**

### **Introduction:**

Obesity and overweight are major epidemic health problems in both developing and developed countries [1-3]. Obesity is rising in both developed and developing countries [4]. Several studies from Saudi Arabia and other gulf countries reported an increase in the burden, where the prevalence ranged from 13% to 50% for overweight and obesity in adults [5-8]. The change in lifestyle and increase in obesity prevalence results in changes in lipid profile [9]. Obesity is an independent risk factor for several diseases including dyslipidemia, coronary artery disease and type2 diabetes [4]. Dyslipidemia indicates to the disruption of lipids amount [10]. Most dyslipidemia is hyperlipidemia which is an elevation of plasma triglycerides, or low levels of high density lipoprotein (HDL) in the blood [10] or high low-density lipoprotein cholesterol (LDL) [11]. Dyslipidemia has a role in the development of several

condition and diseases such as stroke [12,13], atherosclerosis [14,15] and cardiovascular diseases [16,17], resulting in serious medical cost, morbidity and mortality [9]. The prevalence of dyslipidemia varies with socioeconomic, cultural characteristics of distinct population groups and ethnicity [9]. The prevalence of dyslipidemia is increasing globally [18-20] with increasing obesity in both genders in several countries [10,21-23]. This study was established to estimate the prevalence of dyslipidemia among obese individuals.

## **Materials and methods**

### **Study design:**

This is a retrospective study which was conducted in the period between November 2017 and January 2018 at a Primary Care Center in Jizan. We excluded individuals who suffered thyroid disease, renal disease, smokers and alcoholics.

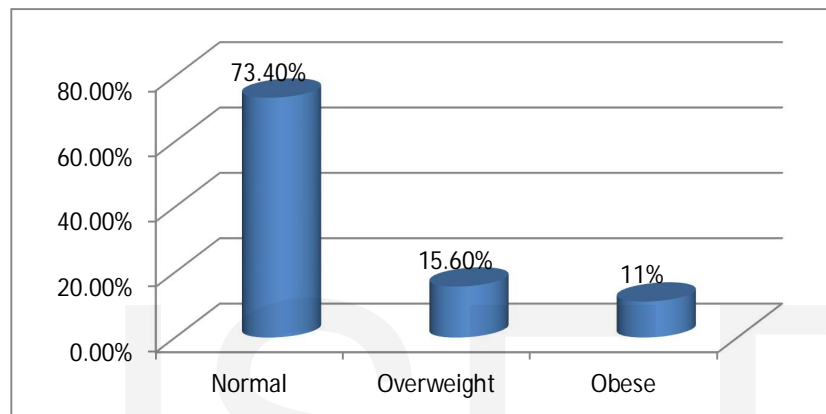
### **Statistical analysis:**

Data were analyzed using SPSS software version 16, simple descriptive analysis in the form of means and standard deviations were calculated for numerical data. Qualitative data were described using numbers and percent distribution comparison between groups was done using an ANOVA test for quantitative variables, Chi-square for qualitative variables. Significant level of less than 0.05 was considered.

## **Results:**

The present study included 436 participants, the range of age was 36-58 years old with a mean of  $46.61 \pm 5.94$ , the range of weight was 54-98 Kg and a mean of  $67.57 \pm 8.94$ , the range of height was 158-172 Cm with a mean of  $165.59 \pm 3.95$ . The BMI

range was 21 to 36 with a mean of  $24.67 \pm 3.36$ . The level of LDL ranged from 95 to 173 with a mean of  $128.23 \pm 19.14$ , while the range of HDL level was 23 to 52 with a mean of  $43.39 \pm 6.75$  and the range of triglyceride level was 51 to 192 with a mean of  $104.87 \pm 35$ . The classification of the study group according to body weight is shown in figure1. Most of participants were normal 320 (73.4%), while there were 68 (15.6%) overweight, obese individuals were 48 (11%).



**Fig1: Classification of study group according to body weight**

By comparing the level of LDL, HDL and triglyceride in the three groups of body weight, it was found that the means of both LDL (164.5) and triglycerides (169.25) were significantly higher in obese individuals than others (P-value <0.001 for each LDL and trig). The mean level of HDL was significantly (P-value <0.001) higher (45.7) in normal people and it was in lowest mean value in obese participants (29.5), table1.

**Table1:Mean lipid profile according body weight**

Lipid profile		Mean	SD	P-value
LDL	Normal	124.32	13.53	<0.001
	Over weight	121.00	20.24	
	Obese	164.50	6.49	
HDL	Normal	45.70	3.94	<0.001
	Over weight	42.29	6.54	
	Obese	29.50	4.54	
Triglecride	Normal	91.41	24.89	<0.001
	Over weight	122.76	26.52	
	Obese	169.25	14.13	

According to hyper LDL, hyper Trig and low HDL, the prevalence of dyslipidemia was more prevalent in obese participants, where all obese individuals had dyslipidemia, followed by overweight individuals, where 28(41.2%) of overweight individuals had hyper LDL, 12 (17.6%) had hyper Trig and 24 (35.3%) had low HDL. 128 (40%) of participants with normal weight had hyper LDL, 32 (10%) had low HDL, while no one had hyper Trig, table2.

**Table2: Prevalence of dyslipidemia according to body weight**

Lipid profile		Normal	Overweight	Obese	P value
Hyper LDL > 130	N	128	28	48	<0.001
	%	40.0%	41.2%	100.0%	
Hyper triglyceride > 150	N	0	12	48	<0.001
	%	0%	17.6%	100.0%	
L HDL < 40	N	32	24	48	<0.001
	%	10.0%	35.3%	100.0%	

## Discussion:

In the present study, the mean age of participants was 46.61 years old and mean of BMI was 24.67. The mean of LDL, HDL and triglyceride was 128.23, 43.39 and 104.87 respectively. In the current study, the large majority of participants were normal in weight (73%), while obese patients represented 11% only of all participants, overweight individuals represented little higher percent (15.6%) than obese. In a previous study, the obese individuals represented 58.57%, while non obese represented 41.42% [4]. Kuwaiti study [10], reported that normal individuals represented 49.6%, followed by overweight and obese representing 30.6% and 19.8% respectively in college students. Dyslipidemia results from obesity, dyslipidemia refers to increase in LDL and triglycerides and decrease in HDL [4]. The present study revealed that the mean levels of the three parameters of lipid profile (LDL, HDL and triglycerides) were significantly differed with body weight. Higher levels of LDL and triglycerides were significantly (P-value <0.001) associated with obesity, while low HDL was significantly (P-value <0.001) associated with obesity. It was found in a previous study that LDL and triglycerides were significantly higher in obese individuals than non-obese ones, while there was no correlation between obesity and HDL levels [4]. A study conducted on children showed that frequency of dyslipidemia was related to higher BMI [24]. Dyslipidemia prevalence was 100% in obese patients in this study regarding the three types of dyslipidemia. The prevalence of dyslipidemia was lower in overweight individuals and the lowest among normal individuals. A study on children and adolescent showed that dyslipidemia was prevalent in 43% among 823 obese children and adolescents [24] and hypertriglyceridemia was the most frequent type of dyslipidemia [24]. Turkish study reported lower rate 42.9% among school aged obese children [25]. Indian study [4]

showed that low HDL was prevalent in 52% of obese patients and triglyceride was high ( $>150$ ) in 74% of obese patients. The present study showed that the three types of dyslipidemia were equally prevalent among obese patients, while in Chinese study [26] it was found that hypertriglyceridemia and low HDL-C were the most prevalent types of dyslipidemia. It was reported that the prevalence of dyslipidemia in Saudi Arabia ranged from 20% to 44% [9] other rates were reported in several study with a range of 2.7% to 51.9% [27-29], however the prevalence in our study is much higher this reinforces the positive association between dyslipidemia and obesity. Several studies have suggested this positive correlation between obesity and dyslipidemia [30-32]. This positive association was reported by Kuwaiti study on college students [10].

### **Conclusion:**

The present study showed that there was a significant association between the mean level of LDL, HDL and triglycerides with body weight of persons. The three types of dyslipidemia were prevalent in all obese persons by 100% and this indicates to the association between dyslipidemia and obesity.

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