

ORIGINAL ARTICLE

The prevalence of dyslipidemia in obese patients

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ABSTRACT

Background: Obesity is a chronic health problem that is associated with several diseases and conditions including dyslipidemia. Dyslipidemia is the disruption of body lipids, which in turn is associated with the development of several diseases including cardiovascular diseases. Obesity prevalence is increasing and as a result dyslipidemia is rising. This study was done to assess the prevalence of dyslipidemia among obese patients.

Methodology: This present study included 250 individuals, 150 of them were obese and 10 were non-obese in September 2018 to November 2018. The parameters of dyslipidemia were investigated for all participants.

Results: The present study included two groups of participants, 40% were non-obese individuals, and 60% were obese patients. There were significant differences (p -value < 0.05) regarding total cholesterol, low density lipoproteins (LDL), high density lipoproteins (HDL), and triglycerides between the two groups. Also, there were significant differences between the two groups regarding different types of dyslipidemia.

Conclusion: The prevalence of dyslipidemia was high among obese patients and the most common type of dyslipidemia was hypercholesterolemia.

Keywords: Dyslipidemia, prevalence, obese patients, types of dyslipidemia.

Introduction

Obesity is an independent risk factor for several diseases including type 2 diabetes mellitus, dyslipidemia, and coronary artery diseases [1]. Body mass index (BMI) is the most beneficial measurement of obesity, normal weight individuals has BMI of range of 18.5–24.9, overweight individuals have BMI of 25–30, whereas obese individuals have BMI above 30 [1]. The prevalence of obesity in several Saudi studies was reported to be in the range of 13%–50% [2–6]. Dyslipidemia is lipids disruption [7], it acts as a risk factor for several chronic diseases which results in morbidity and mortality around the world [8–10], such as type 2 diabetes [11,12], stroke development [13], and atherosclerosis [14]. Dyslipidemia prevalence differs according to cultural characteristics of the population, socioeconomics, and ethnicity [15]. The prevalence of dyslipidemia is raising globally. Hyperdyslipidemia is the dyslipidemia that involves increase in the level of cholesterol and/or triglycerides, or low levels of HDL [16–18]. The global prevalence of dyslipidemia was estimated to range from 2.7% to 51.9% [19–21]. Recently, dyslipidemia became apparent in Saudi Arabia as result of changes in lifestyle, dietary, and sociodemographics [22]. The prevalence in Saudi Arabia was reported to range from 20% to 44% [15]. The

present study was conducted to assess the prevalence of dyslipidemia among obese individuals.

Subjects and Methods

The study was conducted between the period of September 2018 and November 2018. This study included two groups of individuals, 100 healthy individuals, and 150 obese patients. Exclusion criteria of obese patients included suffering from renal or thyroid diseases, being on steroid therapy, alcoholic, and smokers, as well as postmenopausal women. Routine physical examinations were performed for all the participants and several parameters were assessed including, total cholesterol, low density lipoproteins (LDL), high density lipoproteins (HDL), and triglycerides.

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SPSS program version 16.0 was used to analyze the data. Results were represented as frequencies and percent for qualitative data and standard deviation for quantitative data. p -value at <0.05 was considered statistically significant.

Results

The present study included 250 participants, who were divided into two groups as the non-obese group and obese group, non-obese group included 100 (40%) individuals, while obese group included 150 (60%) patients (Figure 1), there was equal ratio of males and females in this study 1:1. The age range of participants was 30–65 years old. Total cholesterol, LDL, HDL, and triglycerides were assessed in individuals in this study, the mean \pm SD of each parameter is shown in Table 1. The mean \pm SD of total cholesterol in non-obese participants was 190 ± 15.2 mg/dl, while in obese individuals it was 245 ± 16.5 mg/dl (p -value = 0.02). The mean \pm SD of LDL in non-obese persons and obese patients was 115.7 ± 6.4 mg/dl and 170.3 ± 9.7 mg/dl, respectively (p -value = 0.01). The mean \pm SD of HDL level for non-obese individuals was 112.9 ± 4.2 mg/dl and for obese patients was 162.7 ± 4.8 mg/dl (p -value = 0.014). The mean \pm SD of triglycerides for non-obese and obese participants was 110 ± 4.2 mg/dl and 160 ± 5.6 mg/dl, respectively

(p -value = 0.021). The distribution of participants in both groups regarding the four parameters according to dyslipidemia prevalence is shown in Table 2. There were significant differences between the two groups regarding the prevalence of dyslipidemia according to the four different parameters levels.

Discussion

In the current study, the prevalence of obesity was 60% among 250 participants. This percent was in agreement with that reported in a previous Saudi study [23], while another Saudi study [5] reported lower percent where the prevalence ranged from 34% to 40%. The prevalence of obesity among Kuwaiti students was found to be 19.8% [7]. In this study, the mean levels of total cholesterol, LDL, HDL, and triglycerides were significantly higher in obese patients than in non-obese individuals. These findings were in agreement with several previous studies; one Saudi study [23] reported that the mean levels of cholesterol, LDL, and triglycerides were higher in obese patients than normal persons; another study [24] reported the increase in cholesterol and LDL in obese patients than non-obese ones. Two previous studies [1,25] reported increase in the triglycerides level among obese patients than non-obese individuals. There are several types of dyslipidemia, hypercholesterolemia which involves the

Table 1. The mean values of different parameters in participants.

Parameters	Non-obese Mean \pm SD	Obese Mean \pm SD	p -value
Total cholesterol (mg/dl)	190 ± 15.2	245 ± 16.5	0.02
LDL (mg/dl)	115.7 ± 6.4	170.3 ± 9.7	0.01
HDL (mg/dl)	112.9 ± 4.2	162.7 ± 4.8	0.014
Triglycerids (mg/dl)	110 ± 4.2	160 ± 5.6	0.021

Table 2. Distribution of participants regarding the level of the 4 parameters in the two groups according to prevalence of dyslipidemia.

Variables	Obese (150) N (%)	Non-obese (100) N (%)	p -value
Total cholesterol (TC)			
<200 mg/dl	30 (20%)	60 (60%)	0.01
>200 mg/dl	120 (80%)	40 (40%)	
LDL			
<100 mg/dl	28 (18.7%)	56 (56%)	0.02
>100 mg/dl	122 (81.3%)	44 (44%)	
*HDL			
Low	90 (60%)	66 (66%)	0.01
Normal/ High	60 (30%)	34 (34%)	
Triglyceride			
<150 mg/dl	40 (26.7%)	75 (75%)	0.01
>150 mg/dl	110 (73.3%)	25 (25%)	

*HDL considered low in case of <40 mg/dl in men and <50 mg/dl in women.

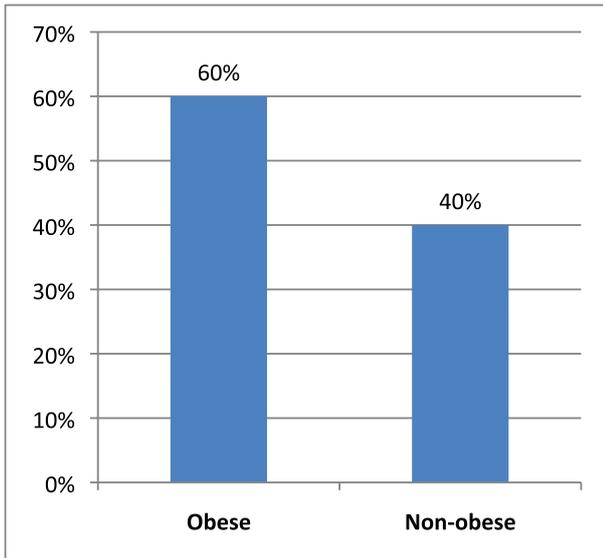


Figure 1. Prevalence of obesity among participants.

elevation of cholesterol level more than 200 mg/dl or elevation of LDL level more than 100 mg/dl, whereas the other type called hypertriglyceridemia involves the elevation of triglycerides level more than 150 mg/dl and low HDL level which is referred when HDL level is less than 50 mg/dl in females and 40 mg/dl in males. The presence of more than one abnormal lipid component refers to mixed hyperdyslipidemia [26]. In the current study, there were significant differences between the two groups regarding the levels of cholesterol > 200mg/dl, LDL > 100 mg/dl, triglycerides > 150mg/dl, as well as low HDL. The prevalence of dyslipidemia ranged from 60% to 81.3%. The present study showed that the most common type of dyslipidemia was hypercholesterolemia among obese patients, where there were 80% and 81.3% of obese patients had total cholesterol level > 200 mg/dl and LDL level >100 mg/dl, respectively, which refers presence of hypercholesterolemia. Moreover, the study showed that in obese patients there were increases in total cholesterol, LDL, and triglycerides, whereas the lower HDL was more common in non-obese individuals. In a previous Saudi study [23], the prevalence of dyslipidemia among obese individuals ranged from 55.6% to 77.78% showing lower prevalence than this study, with higher prevalence of hypertriglyceridemia which was in contrast to our findings, but the author reported that total cholesterol, LDL, and triglyceride elevation was more associated with obese patients, whereas low HDL was associated with non-obese individuals which was in agreement with the present results. Chinese study [27] reported higher prevalence of hypertriglyceridemia and low HDL, whereas in Kuwaiti study [28], it was found that 75% of adults attending the lipid clinics were suffering from either hyperlipidemia or hypertriglyceridemia. A study from India [29], it was found that total cholesterol, LDL, and triglycerides were significantly higher among individuals with high BMI than those with normal BMI

which was in agreement with the present study, whereas in contrast to the present findings, the previous Indian study [29] showed that HDL did not differ significantly between the two groups.

Conclusion

The prevalence of dyslipidemia among obese individuals was high. All types of dyslipidemia were associated with obesity, whereas low HDL was associated with normal individuals, the most common type of dyslipidemia was hypercholesterolemia.

List of Abbreviations

BMI	Body mass index
HDL	High density lipoproteins
LDL	Low density lipoproteins

Funding:

None.

Consent for publication

Informed consent was obtained from all participants

Declaration of conflicting interests:

None.

Ethical approval

Not applicable.

Author details

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