Original Article

Frequency of Dyslipidemia in normotersive non diabetic Obese Patients

Fatima Hamdani, Tahir Bashir, Muhammad Ashraf and Sajid Nisar

Objective: To determine the frequency of dyslipidemia in normotensive, non diabetic obese patients.

Methods: It was a cross sectional study including admitted patients and patients visiting outdoor. After obtaining informed consent, demographic information such as name, age, gender was collected .This study included 200 normotensive, non diabetic obese patients. Serum lipid profile was checked in all patients. The frequency and pattern of dyslipidemia was assessed which was described in frequency distribution tables.

Results: The mean total Cholesterol, mean LDL C, HDL and Triglyceride levels were 211.59 ± 42.39 mg/dL, 131.39 ±17.21mg/dL, 36.46±7.93 mg/dL and 164.69 ± 11.80 mg/dL, respectively. The dyslipidemias were found in 87 (43.5%) patients.

Conclusion: The frequency of dyslipidemias is high among normotensive non diabetic obese patients. So, every patient with obesity should be screened with lipid profile. .

Keywords: Dyslipidemia, cholesterol level, LDL C level, HDL level, TG level, normotensive, non diabetic, obese.

Introduction

The Obesity is a medical condition in which excess body fat accumulates to the extent that it may have an adverse effect on health, leading to reduced life expectancy and it is a complex , multi-factorial chronic disease. 1 Abdominal fat deposition has emerged as strong risk factor for cardiovascular diseases (CVD) and is measured in terms of Waist-Hip Circumference. [2,3]

Obesity has turned into a worldwide epidemic. In the last decades the number of obese patients has increased considerably. It is especially alarming that in recent years the increase was most pronounced in children and that it occurs both in developed, but perhaps even more, in developing countries.[4] Visceral obesity leads to insulin resistance in part mediated by adipokines and free fatty acids (FFA. Dyslipidemia is one of the major risk factors for CVD.[6] Asian populations have a greater percentage of body fat at lower BMIs compared to Western populations.[7] There is recent evidence that the current BMI and waist circumference cutoffs used in the World Health Organization's definitions of overweight and obesity that were developed using Western populations may need to be lowered for Asian populations.[7] It is therefore important to assess the relationship between obesity and dyslipidaemia as both are independent risk factor for the CVD.Obesity and dyslipidemia are often overlooked and under treated. Since these are independent risk factors for cardiovascular events, and therefore health care professionals should consider obesity and dyslipidemia in order to enhance assessment of cardiovascular risks and mortality.[13] Traditionally, diabetic and hypertensive patients are screen for dyslipidemias. Most of the time non-diabetic and normotensive patient do not get screened often as their disease is considered less life threatening. Local literature has shown that in 48% obese persons have serum cholesterol level more than 200mg/dl and 50% have HDL less than 48 mg/dl. [2]

We would like to determine the frequency of dyslipidemias in non-diabetic and normotensive obese subjects in this study. As limited local literature is available about this (one local study conducted in 1997), this risk factor for cardiovascular disease and Asian population is showing increased trend towards obesity due to life style and eating. We want to see recent changes in relation between obesity and dyslipidemia so that by early detection and management of this independent risk factor, it is hoped we may be able to contribute towards minimizing the cardiovascular mortality and morbidity.

Methods

It was a cross sectional study conducted on obese patients visiting indoor and out door of department of Medicine. 200 normotensive, non diabetic obese subjects were included in this study. Both male and

female subjects between 30 and 70 years, BMI >30 and subjects presenting with complaints like walking difficulty, joint pains or somnolence and normotensive patients included. Patients with advanced renal, hepatic and cardiac disease daignosed on urine analysis, renal function tests, liver function tests and complete blood counts were excluded. Two hundred consecutive non diabetics, normotensive patients of both genders presenting to medical out patient clinics and wards at Fatima Memorial Hospital Lahore were offered enrollment in the study. After obtaining informed consent, demographic information such as name, age, gender was collected. . All subjects in the study sample were checked for fasting cholesterol, triglycerides, low density lipoproteins and high density lipoproteins specifically to determine frequency of dyslipidemia as per operational definitions. Lipid levels were measured by automated analyzer. All this information was collected through a specially designed Performa.

Results

There were total 200 patients included in the study. The mean age of the patients in the study was 53.35 ± 14.72 years. There were 24 (12%) patients of age range of 30 - 40 years, 53 (26.5%) patient of age range of 41 - 50 years, 65 (32.5%) patients of age range of 51 60 years and 58 (29%) of the patient of age range of 61 70 years. **Table-1**

Out of 200 patients included in study, 99 patients (49.5%) were male and 101(50.5%) patients were female. The female to male ratio was1 :1.02 **Fig-1**. It was observed that there were 84 (43.5%) patient in Whom the dyslipidemias were present, while in 116 (56.5%) patients there was no abnormality in lipid profile was observed. **Fig 2.**

In group of patients with BMI 30-35, the mean cholesterol level was 209.38±22.39 mg/dL as compared to 214.41±25.75 mg/dL in group BMI 35, ($p > 0.1$). In group of patients with BMI 30-35, the mean LDLC level was 135.47±14.31 as compared to 138.71±11.29 mg/dL in group BMI 35, ($p > 0.1$). In group of patients with BMI 30-35, the mean HDL level was 35.41±6.97 mg/dL as compared to 32.63± 4.79mg/dL in group BMI 35, ($p > 0.1$).

Table-1: Distribution of patients by age (n=200).

Age (Years)	No. Of Patients	Percentage
30 - 40	24	12
41 - 50	53	26.5
51 - 60	65	32.5
61 - 70	58	20
Mean±SD	53.35±14.72	
Range	30 - 70	

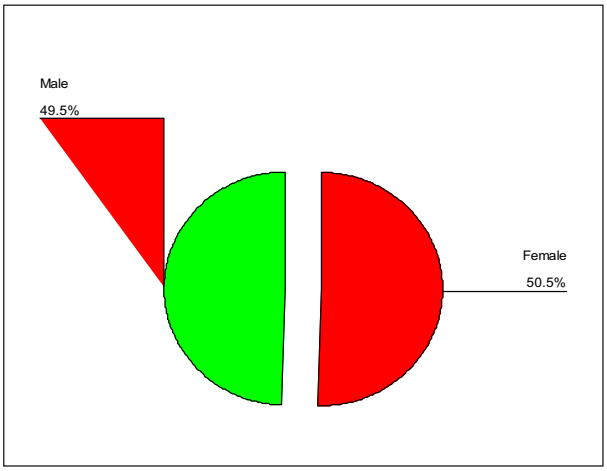

Fig-1: Distribution of patients by sex (n=200).

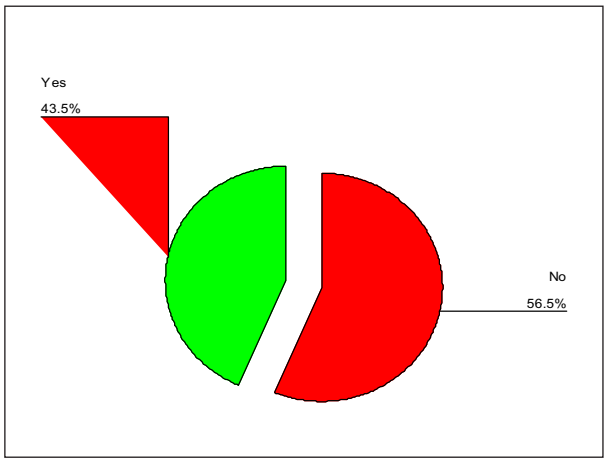

Fig-2: Distribution of patients by presence of dyslipidemia. (N= 200)

Table-2: Distribution by relationship of serum lipids Values with BMI (N= 200)

BMI (mg/dL)	Total (mg/dL)	LDL-C (mg/dL)	HDL (mg/dL)	TG (mg/dL)
30 - 35	209.38±22.39	135.47±14.31	35.41±6.97	156.59±10.78
> 35	214.41±25.75	138.7±11.29	32.63±4.79	161.39±11.79
P - value	0.341	0.974	0.698	0.031

In group of patients with BMI 30-35, the mean triglyceride level was 156.59±10.78mg/dL as compared to 161.39± 11.79 mg/dL in group BMI 35, ($p < 0.1$) **Table 2**.

Discussion

In this study, we studied 200 normotensive non diabetic obese patients to see the presence of pattern of lipid profile and frequency of dyslipidemias. This study was conducted in a tertiary care unit of Pakistan. The results of this study showed that the serum lipid profiles in normotensive and non diabetic patients were not uniform and the dyslipidemia were diagnosed among 43.5% patients. In literature, there are only few studies which have studied the lipid profiles among normotensive and non diabetic patients. The mean age of the patients in our study was 53.35±14.72 years. The majority of patients (61.5%) patients were of age more than 50 years. In a study by Shah SZA, et al, the mean age of the patients was 54.21±9.0 years and 44% patients were of age more than 50 years. In our study, the male and female patients were found to be in almost equal frequency i.e. 49.5% were male and 50.5% were male. The male to female ratio was 1:1.02. In study of 200 patients by Shah SZA, the male were also dominant with a male to female ratio of 1:1.59. This reflects that obesity can be present in variable frequency in different study populations. There was observed an overall increase in lipid profiles in our study and a decrease level of HDL was also seen. An increased values of serum lipid profile including triglyceride, LDL, and serum cholesterol levels have been observed by Shah SZA, et al. Overall, there was an increase in levels of lipids associated with obesity. Our study showed that approximately 43.5% patients suffered from obesity. This showed that almost half of the patients suffered from obesity.The mean triglyceride level in our study was 164.69± 11.80 mg/dL, which was higher than nomal. A difference of approximately 100 mg/dL was found to occur between normal-weight and obese men, with a difference of approximately 60 mg/ dL in women.[8,9] These cross-sectional data are supported by longitudinal data from the Coronary Artery Risk Development in Young Adults (CARDIA) Study, which also show that increasing weight is accompanied by increases in plasma Triglycerides.[8,9]The mean HDL level was 36.46±7.93 mg/dL, which was lower than normal. Obesity also seems to be associated with decreases in high-density lipoprotein (HDL) cholesterol. NHANES II data for white men and women show decreases in HDL with increasing BMI for people of all ages. [8,9] A difference of approximately 10 mg/dL in HDL has been found to occur between normal-weight and obese men, and even greater decreases in HDL have been found with obesity in women.[8,9,10]

The mean LDL-C level 131.39 ± 7.21 mg/dL, which was not greatly different from normal value. NHANES II data show that in young (ages 2044years) white men, a significant increase occurs in LDL concentration with increasing BMI. Obese young men had LDL concentrations approximately 30 mg/dL higher than those of normal-weight men. 8 In middle-aged and older men, however, only minimal differences occurred in LDL cholesterol between BMIs in the range of 21.1 kg/m2 or less to more than 30 kg/m2. [8]

Some longitudinal data show that increases in weight are accompanied by increases in LDL cholesterol.[9] In one study, a 1-U increase in BMI caused a 5.5-mg/dL increase in LDL cholesterol. [12] The patients were also grouped into two groups based on BMI, i.e. 30-35 and > 35. Statistically, no significant difference difference in serum cholesterol, triglyceride levels and HDL levels was found. But the patients in BMI group > 35 showed the mean values on higher side. Statistically significant difference was noticed in patients with triglyceride levels.

The combination of high triglyceride concentrations, low HDL levels, and small dense LDL particles is a metabolically interrelated dyslipidemia that has been associated with insulin resistance.[12] Thus, the obesity associated pattern of dyslipidemia as described previously, particularly in those with central adiposity, probably is related to insulin resistance in obese people, especially those with central adiposity.

This study has certain limitations. Although, this was done in a sample size of 200 patients, this was not a representative of the entire population of Pakistan. However, it provided us the opportunity to see the prevalence of dyslipidemia in obese patients. The results of this study highlight the presence of dyslipidemia among obese patients but how much non obese patients are affected with dyslipidemia is not known for our population. There is need for further studies to determine the frequency of dyslipidemias in non obese patients and compare the two.

Conclusion

A disturbance in serum lipid profiles is observed in majority of normotensive, non diabetic obese

patients. Serum cholesterol level, HDL and TG levels are most commonly affected. A minimum disturbance in LDL-C level is observed. The frequency of dyslipidemia was found high among normotensive, non diabetic obese patients. So, it is suggested that, every normotensive non diabetic patient should be screened for serum lipid profile to detect the possibility of dyslipidemias.

Department of Medicine
Services Hospital, Lahore

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