Lipid Profile In Relation to Gender and Body Mass Index in Students Of Al-Qadisiya Medical College

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الخلاصة

اشترك في هذا البحث ستون طالب وطالبة أعمارهم متقاربة وتم قياس كل من محيط الخصر ومحيط الورك وحساب النسبة بينهما بالإضافة الى قياس الطول و الوزن وحساب كتلة الجسم وتم اخذ تفاصيل كاملة من الناحية الصحية للمشترك وعائلته لغرض معرفة وجود او عدم وجود تاريخ عائلي متعلق بأمراض القلب والشرايين مما يضع المشترك في جهة المعرضين للإصابة. تم سحب الدم من جميع المشتركين بعد أن طلب منهم عدم تناول الطعام قبل السحب من ثلاث الى أربع ساعات وبعد سحب الدم واستحصال المصل تم قياس مستوى الدهون ممثله بالكولسترول والدهون الثلاثية وكذلك (HDL) . أشارت النتائج في هذا البحث بأن مستوى الدهون الثلاثية والكولسترول عالي لدى المشتركين الذين ينتمون الى مجموعة المعرضين للإصابة وبدلاله إحصائية معنوية (٠,٠٥) بينما كان مستوى (HDL) اقل في نفس المجموعة وبدلالة إحصائية معنوية (٠,٠٥) وعندما تم حساب مستوى الدهون لدى الذكور والإناث وجد زيادة بمستوى كل من الدهون الثلاثية و الكولسترول لدى الإناث أكثر من الذكور وبدلاله إحصائية معنوية (٠,٠٥) بينما لا يوجد اختلاف في مستوى (HDL) بين المجموعتين.

Abstract

Objective: The aim of this study is to evaluate the difference in lipid profile between male and female and the effect of BMI and family history on the level of lipid profile. Methods: The study conducted on 60 subjects during three months duration. Full history specially family history of hyerlipidemia, hypertension and cardiovascular disease were taken for each subject. Data like age, gender, height and weight were recorded, also measurement like waist circumference, hip circumference, and body mass index and waist/hip ratio were calculated. Blood tests of lipid profile were measured to the samples. Statistical analysis: statistical analyses were performed using the STATISTICA 6.0 for windows software(stat soft, Tulsa, Oklahoma). Data were expressed as mean ± SD. Difference were considered significant at P<0.05. Results: There was a significant increase in the serum level of triglyceride and cholesterol (P<0.05) in subject with positive family history of hypertension and coronary artery disease in both gender while; the level of HDL- C was significantly higher (P<0.05) in subject with negative family history. The concentration of cholesterol and triglyceride (TG) was significantly higher in female than in male (P<0.05) While no significant differ in the level of HDL- C. Conclusion: there is a relation between high level of lipid and increase of BMI with family history of hypertension and ischemic heart disease (IHD) making the subject risk group even if he or she appears to be normal.

Key words: *BMI (body mass index), W/H ratio(waist/hip ratio), WC(waist circumference), HC(hip circumference).*

Introduction

Height to weight indexes (mainly body mass index) have been used widely in epidemiologic research aimed at exploring the association between obesity and various diseases [1,2]. Recently, however an understanding of the importance of fat distribution particularly abdominal obesity as a risk factor for many disease has become a matter of primary concern [3].

Obesity is rapidly becoming one of the most important medical and public health problems of our time. Obesity is associated with a high rate of morbidity and early mortality if left untreated [4] . Studies indicate that the presence of obesity increases the risk for developing cardiovascular diseases and diabetes . Its role as a health hazard in adults has been well

recognized for some time but little attention has been paid to childhood and adolescent obesity [5].

Obesity in childhood is associated with obesity in adulthood and is a predictor of all causes of obesity-associated mortality during adulthood, particularly mortality from cardiovascular diseases [6]. Dyslipidemia is a marker for ischemic heart disease (IHD), which can be detected in early childhood and tracks to adulthood. Some studies suggest a relation between family history and the liability of developing IHD along with factors like diet, obesity and sedentary activity which increases the risk of developing IHD [7].

Amongst all risk factors, hyperlipidemia is considered as the major risk factor for IHD. The changes in arteries that precede formation of intimal plaques are present as early as 3-9 years of age and the established risk factors are applicable to children as well as adults [8]. Thus, intervention must begin early in life to prevent or delay the onset of atherosclerotic disease. Hence, considering all these factors, the present study was undertaken to study the presence of risk factors for IHD in adult with positive family history of hypertension and coronary artery disease.

Subject and Methods

Sixty Iraqi student in college of medicine in Al- Qadisiya university participate in this study thirty male and thirty female their age range 19-20 years. A full family history were taken from the subject those with family history of hypertension and coronary artery disease considered as positive group those without family history considered as negative group 32 subject have positive family history and the rest have negative family history.

Height was calculated from the anthropometric measurements standing height measurement (CMS weighing equipment LTD, England). The patient stood shoeless with the heels and back in contact with the vertical column of the scale. Weight measurement was done by digital weight scale (Seca, Australia), before each measurement the digital scale was adjusted to zero, the subject was asked to take off his or her shoes and jackets before weighing.

Body mass index(BMI) was calculated as weight (Kg) divided by height squared (meter 2) and was used as the criteria for diagnosis of overweight and obesity (normal weight <25kg/m^2, overweight 25- 30 kg/m^2, obese >30 kg/m^2)

Waist circumference measured on a horizontal plane 1cm above the iliac crest. Hip circumference measure the widest circumference of the buttocks at the area of the greater trochanters.

Five milliliters of fasting venous blood sample was obtained from each subject centrifuge and stored at - 8ºC until assayed. Total cholesterol concentration and triglyceride in serum were measured by enzyme colorimetric testing (Biomerieux Kit, France). The HDL-C concentration was measured by the method of Warnick(9) .

Results and Discussion

Table1 summarizes the anthropometric measurement of the 60 healthy subjects in the present study. The age of all participant range between (19-20).

Subjects with positive family history have a significant high level of cholesterol and triglyceride (P<0.05) than those with negative family history as shown in **Figure 1** and **2**. While the level of HDL was significantly higher in the negative group (P<0.05) **Figure 3**. When we compare between male and female level of cholesterol and triglyceride there were a significant increase in female serum level (P<0.05) than in male. While no significant difference in HDL between them **Figures 4-6**.

The risk group show significant increase in BMI (P<0.05) than the non risk group as shown in **Figure 7**, this is also true for W/H ratio it was again higher in risk group than non risk group as shown in **Figure 8** (P<0.05).

Table 1: The Anthropometric Measurement of The Participant

Anthropometric Measurement	Male Mean ± SD	Female Mean ± SD
Weight (Kg)	91.2 ± 5.3	71.1 ± 5.7
Height (cm)	174.8 ± 2.2	161.3 ± 1.01
BMI (Kg/m²)	29.8 ± 2.1	27.3 ± 2.3
Waist circumference (cm)	117.8 ± 10.8	95.7 ± 8.98
Hip circumference (cm)	127.3 ± 9.7	109.8 ± 7.29
Waist / Hip ratio	0.92±1.1	0.86 ± 1.23

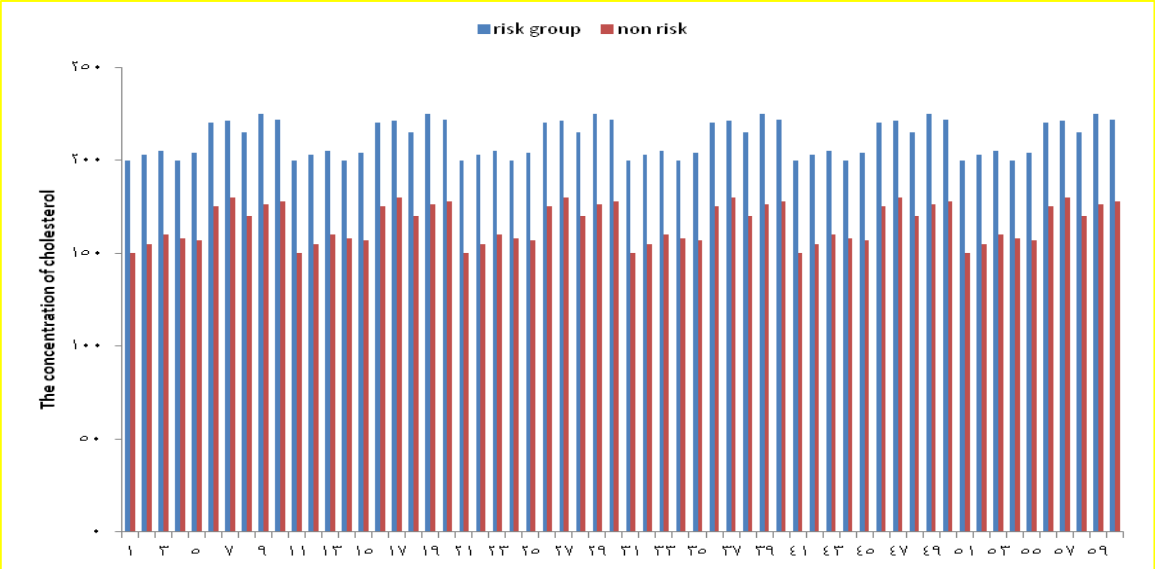

Fig. 1: The Concentration of Serum Cholesterol By mg/dl In Risk and Non Risk Groups It was Significantly Higher (P<0.05) in The Risk Group

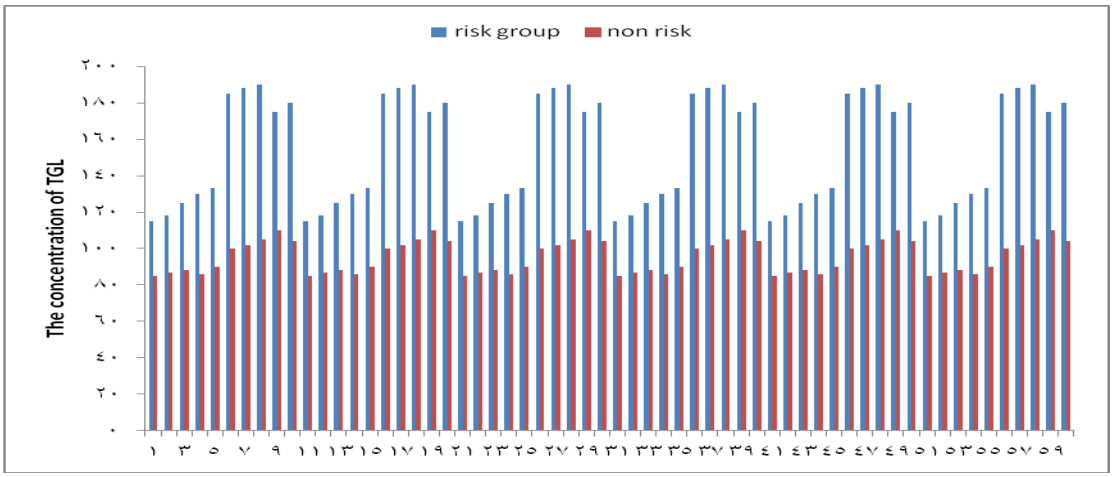

Fig. 2: The Concentration of Serum Triglyceride By mg/dl In Risk And Non Risk Groups It was Significantly Higher (P<0.05) in The Risk Group

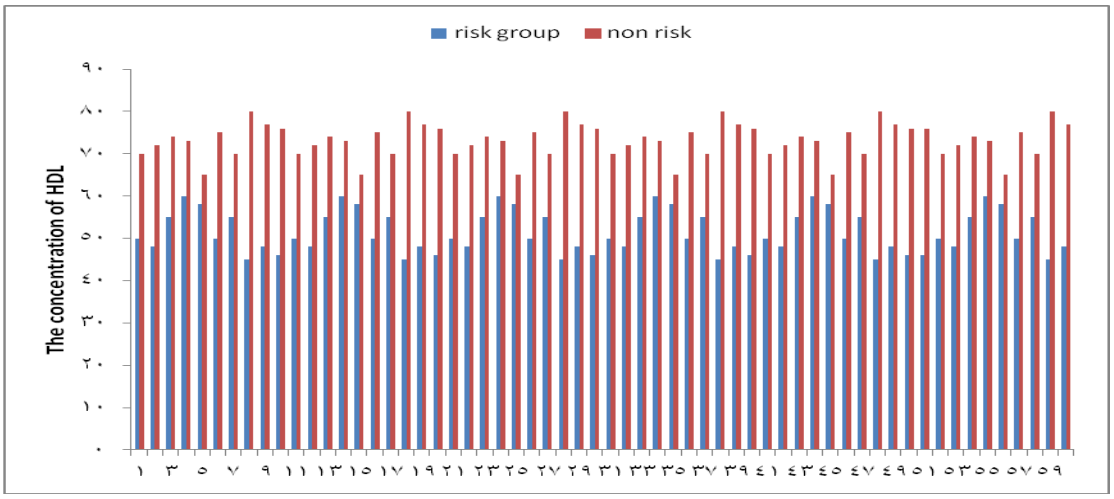

Fig. 3: The Concentration of Serum High Density Lipoprotein By mg/dl In Risk And Non Risk Groups It was Significantly Higher (P<0.05) in The Non Risk Group

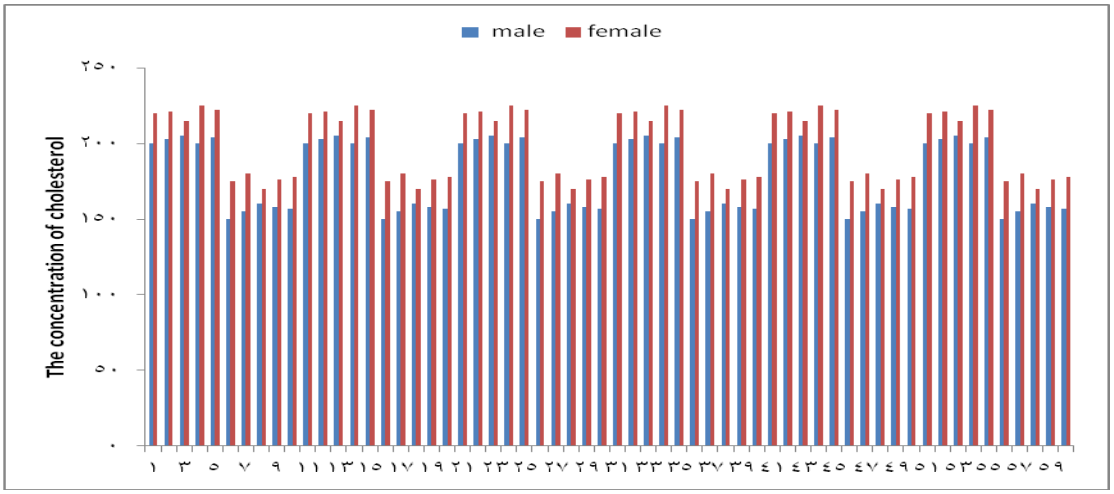

Fig. 4: The Concentration of Serum Cholesterol By mg/dl In Male And Female Groups It was Significantly Higher (P<0.05) in The Female Group

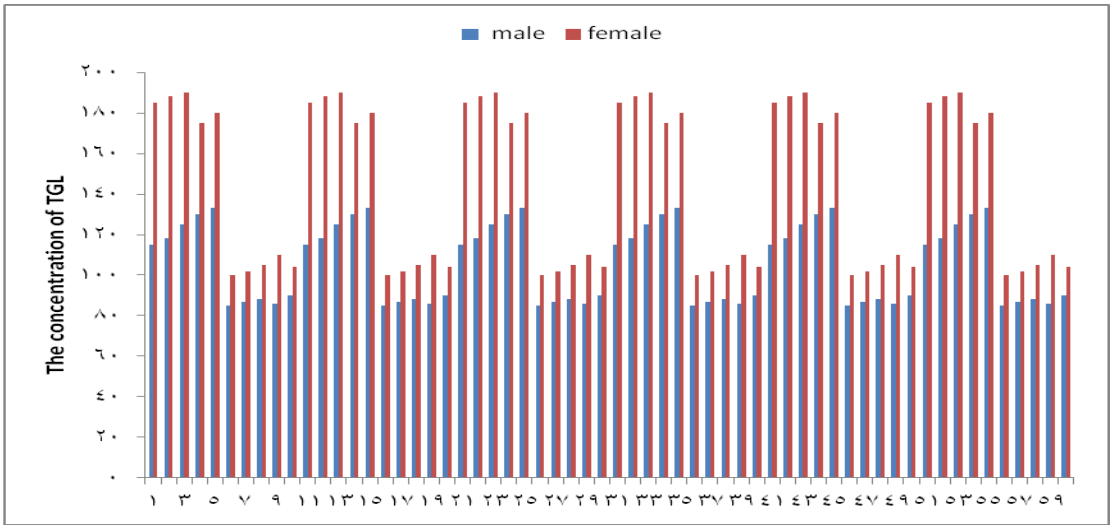

Fig. 5: The Concentration of Serum Triglyceride By mg/dl In Male and Female Groups It was Significantly Higher (P<0.05) In The Female Group

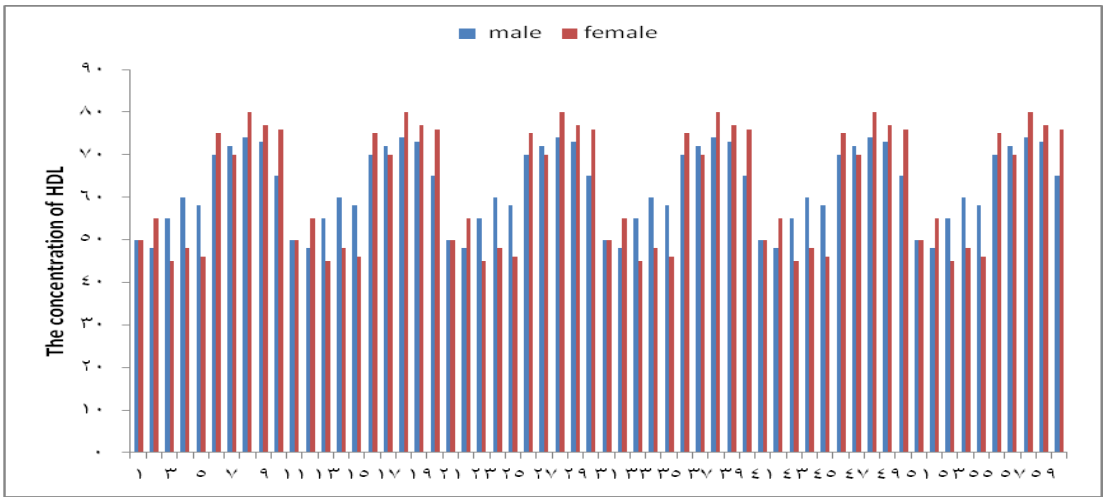

Fig. 6: The Concentration Of Serum High Density Lipoprotein By mg/dl In Male and Female Groups no Significant Difference.

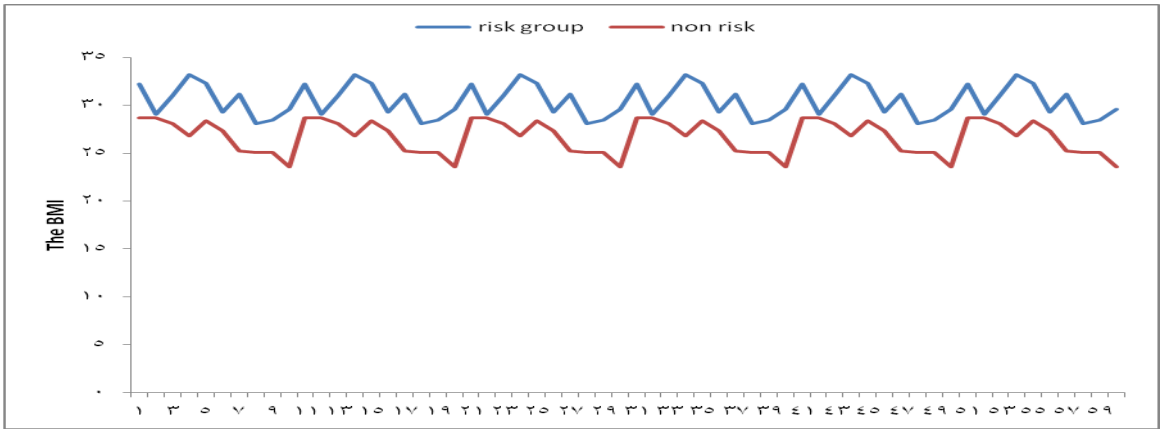

Fig. 7: The Difference In Body Mass Index Between Risk and Non Risk Groups It was Significantly Higher in Risk Group (P<0.05).

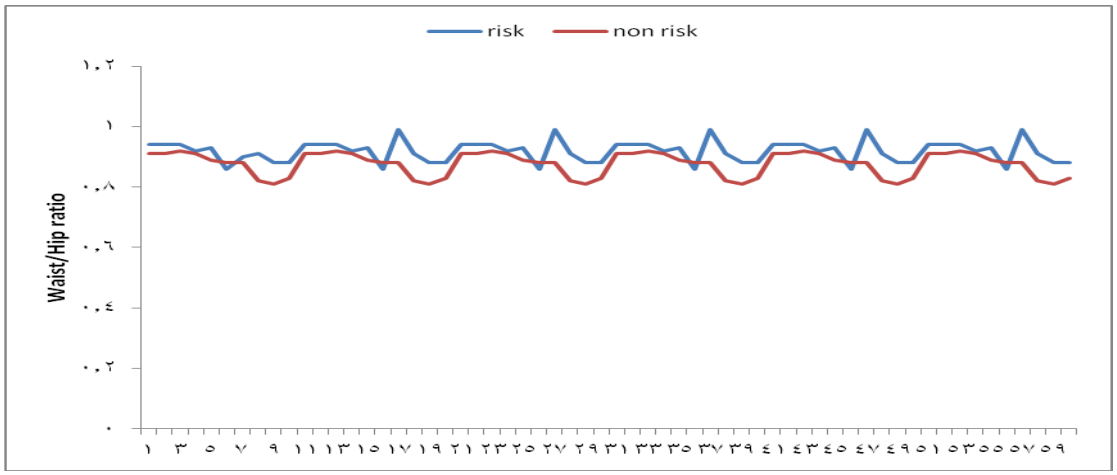

Fig. 8: The Difference in Waist/ Hip Ratio Between Risk and non Risk Groups It was Significantly Higher in Risk Group (P<0.05).

Several studies showed that body composition is better predictor of obesity related metabolic complication than is body weight, although independent contribution of visceral fat to the development of chronic disease is still under review [10]. Abdominal obesity, measured as an elevated waist to hip ratio(WHR), was shown to be a strong risk factor for cardiovascular disease and for type 2 diabetes mellitus [11].

More recently it was suggested that it is not the fat distribution pattern but the absolute amount of intra abdominal fat that influence health risk. Moreover, waist circumference alone was suggested to be better indicator of cardiovascular disease risk than waist hip ratio WHR and was recommended as a tool for identifying a need for weight management [12].

Cholesterol levels in the blood are impacted by both hereditary factors and diet. Cholesterol is produced naturally by the body but also affected by the things you eat. So, both an overproduction of cholesterol by the body and a poor diet can cause unhealthy cholesterol levels, as can smoking and other unhealthy lifestyle choices [13]. Women tend to have higher levels of good cholesterol than men as a result of higher levels of estrogen in the body, which in part explains why pre-menopausal women have a lower risk of heart disease than men [14].

In this study the concentration of good cholesterol (HDL) in the non risk group subjects were significantly higher than the risk group this can be related to the hereditary factors since all participant are healthy persons. gene studies suggests that obesity may modify genetic susceptibility to type 2 diabetes and dyslipidaemia. On an aggregate level, gene obesity interactions are expected to result in different heritability estimates at different obesity levels [15].

Some studies suggest that obese and overweight adolescents are at an increased risk of having impaired glucose and lipid profiles at maturity than normal subjects and genetic factor can play a role in increasing liability to develop overweight and eventually ischemic heart disease (IHD) [16]. In this study subject with positive family history show increase in level of

cholesterol and TG with increase waist to hip ratio (W/H) and BMI than those with no family history.

These findings are in line with most previous candidate association studies, which report that obese individuals in particular display the greatest genetic vulnerability to risk of dyslipidaemia and type 2 diabetes. Some studies confirm the presence of gene–obesity interaction [17].

In conclusion this study suggest that family history of hypertension and IHD can help in identifying risk group persons which may help in preventing or even delay heart disease. Further studies should include gene expression to recognize the particular gene responsible for this changes in lipid profile.

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