Lipid Profile Survey in an adults in An-Najaf/Iraq: A cross-Sectional study

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Abstract. The idea for this work was to assess the frequency of lipid profile in patients at the clinical chemistry laboratory of Al-Sader Medical city in An Najaf/Iraq from January to April 2018. The current work was conducted in clinical chemistry laboratory, Al-Sader medical city , An-Najaf, Iraq after institutional ethical approval and informed, to describe an observational and analytical study of outpatients, between January 2018 and April 2018. A total outpatient number of 820 who were visit the medical city for either check up or complain from an abnormal health state were involved in the this study. Age and sex of patients were ≥ 18 years (404male, 414 female). Triglyceride levels and HDL –c levels were associated with gender and age not associated with occupational class or deprivation category. This contributed to the prevalence of hyperlipidemia. The findings of this study hyperlipidemia affects on the large number of Najaf population. This study suggest the variations in lipid profile association with gender and age may be largely attributed to potentially modifiable factors such as obesity, physical activity and dietary intake.

Keywords: Lipid profile, Lipoprotein, Dyslipidemia, Iraq

Introduction

Lipids consider essential for all mammals involving human that represented by cholesterol, triglycerides (TG) fatty acids, and other types of lipids like phospholipids which being in the structural cell membrane, further more acting as precursor for steroid hormones, bile acid and vitamin D(1). Sometimes the levels of these types of lipids and/or lipoproteins in the human body are abnormal, known as dyslipidemia(2).

Dyslipidemia defined as Perturbation or abnormal of one or more of lipid profile in the human body, like raised levels in total cholesterol (TC), low density lipoprotein (LDL) and/or triglycerides (TG), or decreased levels of high density lipoprotein (HDL) alone(Ni, W., et al, 2015)(Bayram F, et al, 2014). Worldwide, dyslipidemia considered one of the most important and changeable risk factors for heart diseases, which is also a major cause of morbidity and leads to mortality(Ni, W.,et al, 2015). In many countries particularly developing countries complain from persist raises of dyslipidemia as outcome of many causes such as diet, obesity, and lifestyle changes in addition to reduced physical activity(Fuentes R, et al, 2003). Several studies predicted at 2022 the number of people with
dyslipidemia especially of hypercholesterolaemia will increase in many countries at the rate of 1.76 % per year, of which (6).

The morbidity and mortality of heart diseases in Iraq are increase in total number and relative to total 20 top disease burden, equals alteration of diet and life style in the next years (7-12). Globally, cardiovascular disease (CVD) consider a major health problem of East as in West. According to the latest WHO data published in 2017, coronary heart disease deaths in Iraq reached 18.50% of total deaths, and represent first cause of death of top twenty other causes, in this direction Iraq ranks is 19 in the world.

Hyperlipidemia is a powerful and extremely general risk factor for cardiovascular disease (CVD). Treatment of dyslipidemia can be beneficial in minimize or prevent the risk of heart disease by approximately 30 % for both primary and secondary cardiac events (13-15). Many studies suggest blood cholesterol levels a strong predictor of heart disease specially in adult males. Lipid profile scanning policy are precise way to categorize individuals at risk of heart disease mortality (14). According to our knowledge there is no study of the prevalence of lipid profile in an-Najaf/Iraq has been carried out so far. This study supply data on lipid profile distribution in an adult population in An-Najaf.

**Materials and Methods**

**Subjects**

The current work was conducted in clinical chemistry laboratory, Al-Sader medical city, An-Najaf, Iraq after institutional ethical approval and informed, to describe an observational and analytical study of outpatients, between January 2018 and April 2018. A total outpatient number of 820 who were visit the medical city for either check up or complain from an abnormal health state were involved in the our study. Age and sex of patients were ≥ 18 years (404 male, 414 female).

**Blood Specimen**

The blood specimen were collected from all patients in the fasting form. By using a disposal syringe a venepuncture was done to each participant to collect about 5 ml of blood, and transferred to serum-separating tube. To avoid false raise in the serum lipids levels the tourniquet released just before sampling. Within less than 1h serum was separated to avoid artificial changes of HDL levels. The blood was centrifuged at 3000xg for 5 min. The supernatant serum was then pipette out using dry pipettes with disposable tips and transferred to clean tube. The samples were analyzed at the same day.

In the current work, we exclude diabetic subjects who have random blood sugar equals or more than 126 mg/dl (7 mmol/l). All the participants of patients were subjected to biochemical assay of serum triglycerides (TG), total cholesterol (TC), high density lipoprotein (HDL), low density lipoprotein (LDL) and very low density lipoprotein (VLDL) by standard hospital assays. The assays were achieved with a multi-channel Abbott Spectrum autoanalyzer (Abbott Laboratories, C4000, USA) according to instructions of manufactures kits of lipid profile except LDL was calculated using the Friedewald equation (15) \[ \text{LDL} = (\text{TC}-\text{HDL}-\frac{\text{TG}}{5}) \], and VLDL computed from divided total serum TG by 5.

**Statistical Analysis**

Variables were expressed as mean (M) ± standard deviation (SD) according to the distribution of variables. Statistical significance was considered at p < 0.05. Statistical analysis was done using SPSS software version 22.
Results

In the present study, The male and female participants  (820 M/F) did not differ significantly by age. The mean ages for females (414) (50%) and males (406) (50 %) were respectively 46.1 and 47.3 years old (Table 1).

Table 1: Distribution of sex and ages of the study population

| Gender | No. of patients | Age in years |
|--------|----------------|--------------|
| Male   | 406            | 47.3 ± 7.2   |
| Female | 414            | 46.1 ± 8.4   |
| Both   | 820            | 46.7 ± 7.5   |

Figure: 1 Lipid profile levels distribution in male

The study included (820) patients with frequency of lipid profile (406 men and 414 women) for whom serum lipids measurements were available. The sex and age distribution for the total sample included in the study is illustrated in (Table 1). In the present study, The male and female participants (820 M/F) did not differ significantly by age. The mean ages for females (414) and males (406) were respectively 46.1 and 47.3 years old (Table 1).
Table 2: Random blood glucose levels and lipid profile levels in both gender among study population

| Lipid profile mg/dl | Male (N=406) | Female (N=414) | Total (N=820) | P-value |
|---------------------|--------------|----------------|---------------|---------|
| TC                  | 204.79±82.1  | 203.84±66.71   | 204.2±74.6    | N.S     |
| TG                  | 181.1±107.45 | 155.4±79.69    | 168.13±95.3   | 0.000   |
| HDL                 | 36.96±9.87   | 42.48±10.5     | 39.75±10.5    | 0.000   |
| LDL                 | 134.77±81.71 | 130.69±63.21   | 132.55±73     | N.S     |
| VLDL                | 32.19±23.4   | 28.54±18.8     | 30.35±21.3    | N.S     |
| RBS                 | 159.33 ± 46.3| 159.8 ± 45.44  | 159.56±45.8   | N.S     |

Fasting triglyceride levels were higher among men than women (Table 2). Among men, triglyceride levels were not associated with occupational class or deprivation category. Men had higher mean TG levels than women, TG levels was significantly (p-value = 0.000) higher in men than women when compared. Women had higher HDL-cholesterol levels than men (Table 2), HDL-cholesterol levels were significantly (p value = 0.000) higher in women than men when compared. Also Among women, HDL-cholesterol levels were not associated with occupational class or deprivation category. No significantly was found between the (men , female) and other parameters of lipid profile.

Discussion
The reason for conducting this survey and study due to shown a large number of patients who have a history of hyperlipidemia in the province of Najaf Al-Ashraf. There are many reasons that lead to hyperlipidemia a direct or indirect cause, so we want to study and explain these reasons. Distribution of age in this survey revealed that age factor is directly related to abnormally high lipid profile, which is an acceptable fact where elderly people have hyperlipidemia in comparison with younger people.

In this survey of population, the means for serum levels of cholesterol, LDL, HDL and triglycerides were as [204.2±74, 39.39±10.5, 132.55±73 and 168.13±95.3] respectively. Overall the population considered hypercholesterolemic when a cholesterol levels exceed 200 mg/dl (16).
Table 2 shows the levels of cholesterol and LDL not exhibit any significance difference between genders. It is exciting to note that value of HDL was significantly higher in females than males (42.48±36.96; \( P < 0.001 \)), TG exhibited an reverse image, being higher in males than females (181.1±155.4; \( P < 0.001 \)). For the reason that sex did not associated significantly with levels of LDL and total cholesterol, so we then focused our investigation on HDL and TG levels, then sought to decide if the age contributes to the observed sex differences. The HDL and TG levels illustrated a significant increases with age in males and females. TG levels were higher in males than females, whereas HDL was higher in females than males. We say here that the large number of participants in the survey and study were resulted as hyperlipidemia, very frightening and dangerous because the participants are confused about their lipid profile. To educate the public about the danger of dyslipidemia as well as its relation to cardiovascular diseases need an intensive efforts. Although, prevalence of high TG was seen in males more than females. This elevation of TG levels in males may be due to the differences of sex hormones between male and female, mainly estrogen in female that suggesting a protective effect against the elevation of cholesterol or TG levels in AL-Najaf peoples (17)(18).

The cholesterol levels increase consistent with age in the female in the study even beyond menopause, estrogen may be participate in the TG levels raises, this finding was walk together with other reports suggesting estrogen participating hypertriglyceridemia (19), while other studies suggesting that menopausal women have higher levels of LDL and total cholesterol levels when compared with pre-menopausal women(20). Ironically enough, if inject an estrogen has been shown to reduce hepatic cholesterol synthesis leading to lowering blood LDL levels of (21).

On the other hand testosterone in men consider predispose for hyperlipidemia. Several studies suggest that testosterone levels in males proportion inversely to the lipid levels in serum (22). However in an animal study explained that testosterone deficiency in male mice exhibit higher cholesterol levels(23).

Smoking may explain the higher prevalence dyslipidemias in males against females, and clarify increased the prevalence of hypercholesterolemia and triglyceridemia. In this work supported that smoking status of participants is more common among men than women(24).

It was observed in the study or survey that LDL is lower in women than men, while TG increases in women than men. This could be elucidated by the levels of estrogen and/or testosterone which are decreased with age. Individuals who have continuous physically activity and healthy dietary habit seen lower TG and or LDL levels. So, these finding imply that the sedentary lifestyle in age group may related to the insignificant differences between both genders(25). Additional researches are necessary to decide if this effect is adjusted by other factors, such as sex, age, or other factors related to dietary lifestyle. A one study in Korean population showing a strong reduction in the prevalence of hypertriglyceridemia due to fruit intake(26). In this direction, the consumption of enrich fruits and vegetables diet is reported to well modulate the lipid profile in humans(27).

The occurrence of hypercholesterolemia in AL-Najaf is higher than Saudi Arabia(28), Lebanon(29), Turkey (30) and India(31) but lower than that in England(32) and compatible with USA (33) and Finland(34). When compared with other countries. Finally to reduce the major risk factors for cardiovascular disease(CVD) it is recommended that the patient be educated and develop national programs for that.

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