

Pyrex Journal of Biomedical Research
Vol 1 (2) pp. 011-013 July, 2015
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Original Research Article

Assessment of lipid Profile in Premenopausal and Postmenopausal Sudanese Women

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Accepted 9th July, 2015

Background: The effect of the hormonal changes associated with menopause on plasma lipid levels may play an important role in most cardiac related disorders associated with menopause.

Objectives: To study the plasma lipid profile in premenopausal and postmenopausal women, and to compare the differences of plasma lipid profile between premenopausal and postmenopausal women.

Methods: Case control study, carried out in the Aljazeera state during the period from January to March 2015. A total of 60 premenopausal and 60 postmenopausal women were recruited for the study. The subjects have risk factors that may affect the lipid profile were excluded. A 2.5 ml of venous blood was collected after overnight fasting in all the subjects for estimation of plasma levels of total cholesterol, HDL, LDL and triglycerides.

Results: As compared to premenopausal women, mean level of total cholesterol, LDL and triglyceride were significantly higher in postmenopausal women. While the level of HDL was significantly lower in postmenopausal women. (mean±SD) of lipid profile (total cholesterol, HDL, LDL and triglyceride) in premenopausal women, respectively (153.2±22.0, 60.34±4.31, 75.23±21.24, 88.31±20.74) while the (mean±SD) of lipid profile (total cholesterol, HDL, LDL and triglyceride) in postmenopausal women respectively (180.91±28.14, 57.20±8.71, 100.43±26.16, 116.40±41.33)

Interpretation and conclusion: According to the present study, menopause is associated with the altered plasma lipid profile thus, an independent risk factor for developing cardiovascular diseases. Therefore, it is important to consider each and every postmenopausal woman to undergo screening for abnormal lipid profile. In them, specific health education strategies are needed in an order to prevent the emerging cardiovascular diseases.

Key words: Plasma lipid profile, premenopausal women, postmenopausal women.

INTRODUCTION

Menopause means permanent cessation of menstruation at the end of reproductive life due to loss of ovarian follicular activity^[1]. The effect of the hormonal changes associated with menopause on the plasma lipid levels plays important role in most cardiac related disorders associated with menopause^[2]. Up to the age of 50 years, the prevalence of coronary Artery Disease (CAD) among women is lower than among men, but the incidence rises significantly after the menopause. The incidences of coronary heart disease have been observed to be increased in postmenopausal women until they become similar to the corresponding rates in men of similar age^[3].

Multiple risk factors have been identified as contributory to the development of CAD. Hypercholesterolemia is a key factor in the pathophysiology of atherosclerosis^[4]. After menopause, there is a loss of ovarian function. This results in adverse changes in glucose and insulin metabolism, body fat distribution, coagulation, fibrinolysis, vascular endothelial dysfunction and also derangement of lipoprotein profile. Lack

of estrogen is an essential factor in this mechanism^[5, 6]. Plasma lipids are groups of organic substances of fatty nature, which are insoluble in water, soluble in fat solvent. There are numerous different lipids known to exist in human, only a limited number are clinically important, they serve as hormone precursors, aid in digestion, provide energy reserve and metabolic fuel, act as a functional and structural component and prevent heat loss^[7].

The present study was aimed to compare the plasma level of total cholesterol, triglycerides, High Density Lipoprotein (HDL) and Low Density Lipoprotein (LDL) between premenopausal and postmenopausal women.

Material and Methods

Study area: The study was carried out in the Aljazeera state during the period from January to March 2015.

Table 1: the mean \pm SD of parameter in the study population

Parameter	Premenopause n=60	Postmenopause n=60	p.value
Total cholesterol	153.23 \pm 22	180.91 \pm 28.14	0.000
HDL	60.34 \pm 4.31	57.20 \pm 8.71	0.014
LDL	75.23 \pm 21.24	100.43 \pm 26.16	0.000
Triglyceride	88.31 \pm 20.74	116.4 \pm 41.33	0.000
Age	23.03 \pm 4.37	63.98 \pm 10.01	
Duration		14.47 \pm 9.6	

Study population

The test group covered sixty healthy post menopausal women in addition to sixty healthy women with normal cycle as a control group, the age ranged between 15 to 95 years. Women having any condition or disorders which might affect lipids metabolism, like smoking, alcoholism, diabetes mellitus, hypertension, renal failure, nephrotic syndrome, hypothyroidism, liver disease, drug history like estrogen, progesterone, blocker, steroids, were excluded.

Study variables

Total cholesterol, triglycerides, high density lipoprotein (HDL) and low density lipoprotein (LDL) were estimated using spectrophotometrical method.

Collection of Sample

Samples were collected from fasting women, under aseptic condition. The sterile disposable plastic syringe was applied, and 2.5 ml of blood was taken, and emptied in heparinized container, centrifuged at 3000rpm for 5 minutes. The freshly obtained plasma was preserved at 2-8°C prior to analysis.

Statistical analysis

Data were analyzed by computer software, by using SPSS program. The mean and standard deviation of total cholesterol, triglycerides, high density lipoprotein (HDL) and low density lipoprotein (LDL) were obtained, and t test was used for the comparison ($P \leq 0.05$) was considered significant, and the correlation (r) is significant as the value ($P \leq 0.05$).

Ethical consideration: Approval for this study was taken from the clinical chemistry department, faculty council, and verbal consent from individuals under study.

Results

The study was carried out on 60 premenopausal and 60 postmenopausal women and showed the following results. General examination and systemic examination of the subjects

were normal premenopausal women from the age group (15-31) years with mean age of 23.03 years. Postmenopausal women were from the age group 47-95 years with mean age of 63.93 years.

Discussion

After menopause, the reduced oestrogen production from ovaries results in derangement of lipoprotein profile, adverse changes in glucose and insulin metabolism, body fat distribution, coagulation and fibrinolysis and dysfunction of vascular endothelium (5,10). Oestrogens have several cardio-protective mechanisms that change the vascular tone by increasing nitrous oxide production. Oestrogens stabilize the endothelial cells; they enhance antioxidant effects and alter fibrinolytic protein. All these are cardio protective mechanisms which get lost with the onset of menopause^[11, 4].

Plasma lipids can be divided into the proatherogenic lipoproteins like LDL, and antiatherogenic HDL. Assessment of the relative proportions of cholesterol in these two fractions can be more valuable than the individual lipid measurements^[12]. As compared to premenopausal women, mean level of plasma total cholesterol, triglyceride and LDL were significantly higher in postmenopausal women and level non significantly increased with increase in duration of menopause and age; except in triglyceride increased with an increase in the age and duration of menopause. While the level of plasma HDL was significantly lowered, in postmenopausal women and level insignificantly decreased with increase in the age and duration of menopause.

Since factors affecting lipid profile were excluded, these changes may be related to a deficiency of estrogen occurring after menopause. The present study correlates well with results of Usero C.A.O.et al^[8]. Who found statistically significant increase in total cholesterol and LDL and statistically significant decrease in HDL after menopause. The present study also correlates with results of Igweh J.C.et al^[4]. Who found statistically significant increase in LDL and statistically significant decrease in HDL after menopause. The present study also correlates well with results of Varu M.S.et al^[9]. Who found statistically significant increase in total cholesterol and LDL and statistically significant decrease in HDL after

menopause. The present study correlates well with results of Srinivas RK et al ^[13]. Who found a significant increase in total cholesterol, triglyceride, and LDL cholesterol in

Conclusion

According to the present study, menopause is associated with altered lipid profile and thus an independent risk factor for developing cardiovascular diseases. Therefore, it is important to consider each and every postmenopausal woman to

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undergo screening for abnormal lipid profile. In postmenopausal women, specific health education strategies are needed in an order to prevent the emerging cardiovascular diseases.