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Assessment of lipid profile in post menopausal women

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Abstract--- Background: Younger age at menopause is associated with greater risk for coronary heart disease (CHD) and all-cause mortality. The present study was conducted to assess lipid profile in post menopausal women. Materials & Methods: 80 women in age ranged 20-60 years were divided into 2 groups. Group I comprised of premenopausal women (20- 40 years) and group II post menopausal women (40-60 years). 5 ml of venous blood was withdrawn from anticubital vein with full aseptic precautions. Clear unhaemolysed serum was obtained by centrifugation. Estimation of serum lipids such as total cholesterol (TC), triglyceride (TG), high density lipoprotein cholesterol (HDL-C) and low density lipoprotein cholesterol (LDL-C), very low density lipoprotein (VLDL) was done. Results: The mean TC (mg/dl) in group I was 178.2 and in group II was 246.4, TG was 126.2 and 138.4, HDL- C was 62.4 and 42.8, LDL- C was 132.8 and 232.6 and VLDL was 26.2 and 28.0 in group I and II respectively. The difference was significant ($P < 0.05$). Conclusion: Higher level of lipid profile in post menopausal women increases the risk of cardiovascular diseases.

Keywords---cardiovascular diseases, lipid profile, post menopausal women.

Introduction

Younger age at menopause is associated with greater risk for coronary heart disease (CHD) and all-cause mortality. Studies have shown associations between postmenopausal status and elevated levels of total cholesterol and low density lipoprotein cholesterol.¹ Although lipoprotein is an established coronary risk factor, the association of the menopause transition with lipoprotein is unclear. Furthermore, because both menopause and lipids are highly correlated with age, it remains unclear whether menopausal lipid changes are independent of age effects.² Obesity has been associated with adverse lipid profiles and body mass index has been related to endogenous estradiol and follicle-stimulating hormone levels during menopause. Smoking is associated with decreased high density lipoprotein cholesterol and earlier menopause.³ Physical activity has a favorable effect on lipids and maintenance of activity during menopause may prevent or attenuate weight gain. Whether these factors affect lipid changes during menopause is potentially important for identifying women at risk for adverse postmenopausal lipid profiles.⁴ As the incidence of CAD is higher in men but it increases significantly in women after menopause. The changes in the hormonal status after menopause such as low estrogen, increased luteinizing hormone and follicular stimulating hormone exert significant effect on plasma lipids and lipoproteins metabolism in post menopausal women.⁵ The present study was conducted to assess lipid profile in post menopausal women.

Materials and Methods

The present study comprised of 80 women in age ranged 20-60 years. All gave their written consent for the participation in the study. Demographic data such as name, age etc. was recorded. Group I comprised of premenopausal women (20- 40 years) and group II post menopausal women (40-60 years). 5 ml of venous blood was withdrawn from anticubital vein with full aseptic precautions. Clear unhaemolysed serum was obtained by centrifugation. Estimation of serum lipids such as total cholesterol (TC), triglyceride (TG), high density lipoprotein cholesterol (HDL-C) and low density lipoprotein cholesterol (LDL-C), very low density lipoprotein (VLDL) was done. Results were statistically analysed. P value less than 0.05 was considered significant.

Results

Table I
Distribution of patients

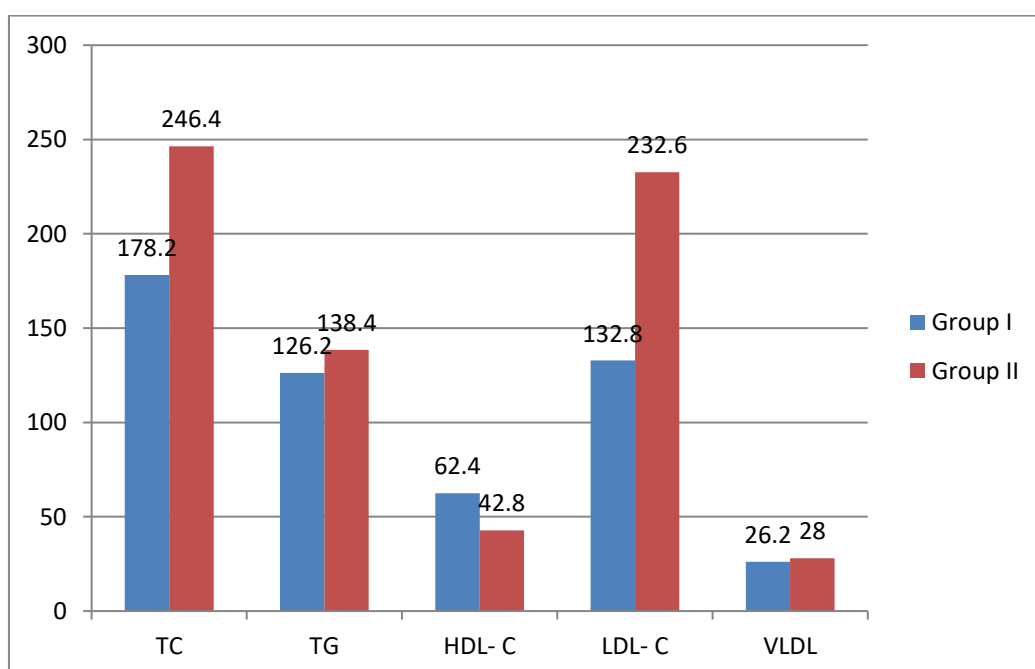
Groups	Group I	Group II
Status	premenopausal	post menopausal
Number	40	40

Table I shows that group I comprised of premenopausal women (20- 40 years) and group II post menopausal women (40-60 years).

Table II
Comparison of lipid profile in pre and post menopausal women

Parameters	Group I	Group II	P value
TC	178.2	246.4	0.05
TG	126.2	138.4	0.04
HDL- C	62.4	42.8	0.01
LDL- C	132.8	232.6	0.01
VLDL	26.2	28.0	0.17

Table II, graph I shows that mean TC (mg/dl) in group I was 178.2 and in group II was 246.4, TG was 126.2 and 138.4, HDL- C was 62.4 and 42.8, LDL- C was 132.8 and 232.6 and VLDL was 26.2 and 28.0 in group I and II respectively. The difference was significant ($P < 0.05$).



Graph I. Comparison of lipid profile in pre and post menopausal women

Discussion

Cardiovascular disease is a leading cause of mortality in both men and women in industrialized world. The various physiological risk factors for cardiovascular disease are complex and the incidence of cardiovascular disease increases with age in both the sexes, but in women the risk increases markedly after menopause. Menopause is the permanent cessation of menstruation which is retrospectively determined following twelve months of amenorrhoea.⁶ The immediate symptoms of menopause are the effects of hormonal changes on various organ systems mainly on cardiovascular system. Studies have shown that women are at less risk of developing CAD than their male counterparts, but this benefit is abolished after 60 years of age. After menopause, as there is loss of

ovarian functions and depletion of various ovarian hormones. These results in adverse changes in glucose and insulin metabolism, body fat distribution, coagulation, fibrinolysis and vascular endothelial dysfunction. The major effect of Estrogen on lipid metabolism is by its action on regulation of various LDL receptors in Liver.⁷ Estrogen acts on these LDL receptors on the hepatocytes and leads to increased clearance of LDL-C particles. By this mechanism levels of LDL-C are regulated in the serum. If the concentration of small dense particles are increased it is characterized by elevated serum total cholesterol, triglycerides, LDL-C, VLDL and reduced HDL-C.^{8,9} In association to these changes in lipid profile the individuals also show increased adipose tissues and increased insulin resistance. These fractions of lipid profile are highly atherogenic and lead to increased chances of CAD.¹⁰ The present study was conducted to assess lipid profile in post menopausal women.

We found that group I comprised of premenopausal women (20- 40 years) and group II post menopausal women (40-60 years). Tiwari et al¹¹ performed comparison of the serum lipid profile in premenopausal and postmenopausal women with reference to body mass index. The study was conducted with 100 premenopausal and 100 post menopausal women. The BMI of 50 women in either group was 18.9-24.9 and another 50 women was 25-29.9. Various factors which may alter lipid profile were excluded. After overnight fast of 12 hrs, 5 ml venous blood was withdrawn and sent for lipid profile analysis. There was significantly high serum levels of total cholesterol, LDL, VLDL and triglycerides and significantly low levels of serum HDL in postmenopausal women group in comparison to their pre menopausal counterparts irrespective of their BMI levels ($p < 0.05$).

We observed that mean TC (mg/dl) in group I was 178.2 and in group II was 246.4, TG was 126.2 and 138.4, HDL- C was 62.4 and 42.8, LDL- C was 132.8 and 232.6 and VLDL was 26.2 and 28.0 in group I and II respectively. Derby et al¹² in their study lipid changes were examined in relation to changes in menopausal status and in levels of estradiol and follicle-stimulating hormone in 2,659 women followed in the Study of Women's Health Across the Nation (1995–2004). Baseline age was 42–52 years, and all were initially pre- or perimenopausal. Women were followed annually for up to 7 years (average, 3.9 years). Lipid changes occurred primarily during the later phases of menopause, with menopause-related changes similar in magnitude to changes attributable to aging. Total cholesterol, low density lipoprotein cholesterol, triglycerides, and lipoprotein (a) peaked during late peri- and early postmenopause, while changes in the early stages of menopause were minimal. The relative odds of low density lipoprotein cholesterol (≥ 130 mg/dL) for early postmenopausal, compared with premenopausal, women were 2.1. High density lipoprotein cholesterol also peaked in late peri- and early postmenopause. Results for estradiol and follicle-stimulating hormone confirmed the results based on status defined by bleeding patterns. Increases in lipids were smallest in women who were heaviest at baseline.

Conclusion

Authors found that higher level of lipid profile in post menopausal women increases the risk of cardiovascular diseases.

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