

Original Research

Assessment of lipid profile in pre and post menopausal women

Ranjit Kumar

Assistant Professor, Department of Biochemistry, Major S D Singh Medical College and Hospital, Farrukhabad, Uttar Pradesh, India

ABSTRACT:

Aim of the study: To assess lipid profile in pre and post-menopausal women. **Materials and methods:** The present study was conducted in the Medical institution. For the study, we randomly selected 50 premenopausal women and 50 postmenopausal women. The postmenopausal women who were studied were those with a history of natural menopause, who had cessation of menstruation for a minimum of one year, and premenopausal women who were studied were those who had regular menstruation. This however, was done on the 7th day of the last menstrual period for the premenopausal group. **Results:** It was observed that TC, TGL, VLDL and LDL were significantly elevated in post-menopausal women as compared to pre-menopausal women. Similarly, the HDL level in premenopausal level was higher as compared to post-menopausal women. **Conclusion:** Within the limitations of the present study, it can be concluded that post-menopausal women are at more risk of cardiovascular diseases as compared to premenopausal women.

Keywords: lipid, cardiac, pre-menopause, post-menopause

Corresponding author: Ranjit Kumar, Assistant Professor, Department of Biochemistry, Major S D Singh Medical College and Hospital, Farrukhabad, Uttar Pradesh, India

This article may be cited as: Kumar R. Assessment of lipid profile in pre and post menopausal women. J Adv Med Dent Scie Res 2018;6(4):171-173.

INTRODUCTION

Studies have shown that women are at a lesser risk of developing cardiovascular disease than their male counterparts before menopause, but this advantage is abolished after menopause.^{1,2} Several studies have been performed based on the hypothesis that people with an atherogenic lipid profile might have lower BMD than those with normal lipid levels.³⁻⁵ A high total cholesterol (TC) concentration is related to the risk of cardiovascular disease. Lipid levels are also used to assess the risk of coronary heart disease, as cutoffs indicating that the commencement of treatment is appropriate and as goals in patient outcomes.⁶⁻⁷ Furthermore, because both menopause and lipids are highly correlated with age, it remains unclear whether menopausal lipid changes are independent of age effects.^{8,9}

MATERIALS AND METHODS

For the study, we randomly selected 50 premenopausal women and 50 postmenopausal

women. The postmenopausal women who were studied were those with a history of natural menopause, who had cessation of menstruation for a minimum of one year, and premenopausal women who were studied were those who had regular menstruation. A written informed consent was taken from each patient before participating in the study.

RESULTS

Table 1 and Fig 1 depicts the comparison of plasma lipid levels in pre-menopausal and post-menopausal women. It was observed that TC, TGL, VLDL and LDL were significantly elevated in post-menopausal women as compared to pre-menopausal women. Similarly, the HDL level in premenopausal level was higher as compared to post-menopausal women. The results were observed to be statistically significant. This suggests that the lipid profile of post-menopausal women is more on the unhealthy side as compared to pre-menopausal women.

Table 1: Comparison of Plasma lipid levels in pre-menopausal and post-menopausal women

| Plasma lipids | Pre-menopausal women | Post-menopausal women | p-value |
|---------------|----------------------|-----------------------|---------|
| TC | 146.75 | 221.38 | 0.01 |
| TGL | 107.66 | 133.26 | 0.02 |
| HDL | 48.3 | 31.27 | 0.03 |
| VLDL | 22.79 | 28.01 | 0.05 |
| LDL | 88.62 | 155.21 | 0.01 |

DISCUSSION

In the present study, we observed that the various parameters of lipid profile were healthier in pre-menopausal women as compared to post-menopausal women. This has been suggested that increased lipid profile in post-menopause occurs due to elevated oestrogen levels after post menopause. The results were statistically significant. Table 1 and Fig 1 depicts the comparison of plasma lipid levels in pre-menopausal and post-menopausal women. It was observed that TC, TGL, VLDL and LDL were significantly elevated in post-menopausal women as compared to pre-menopausal women. Similarly, the HDL level in premenopausal level was higher as compared to post-menopausal women. The results were observed to be statistically significant. This suggests that the lipid profile of post-menopausal women is more on the unhealthy side as compared to pre-menopausal women.

N Wang et al compared serum lipid values in premenopausal and postmenopausal women and to evaluate the relationship between menopause and lipid profiles. They concluded that prevalence of dyslipidemia is higher in post-menopausal women than in pre-menopausal women, and the values of TC, TG, LDL-C, non-HDL-C, TC/HDL-C ratio of postmenopausal women are significantly higher than those of premenopausal women. Menopause is associated with dyslipidemia in this cohort.¹⁰

K R Saha et al carried out a study which revealed that menopause leads to changes in hormonal status, metabolism and lipid profile. Since there is an increased risk of cardiovascular diseases for women after menopause, the present study is aimed at comparing the changes of serum lipid profile in premenopausal women with that of their postmenopausal counterparts. This is to enable us ascertain the relative risk of developing cardiovascular disease in postmenopausal women in Bangladesh. The results showed statistically significant increase in total cholesterol and LDL cholesterol ($p < 0.001$) of menopausal women compared to reproductive age group. The postmenopausal women had higher but non-significant ($p = 0.675$) concentrations of triglycerides than the premenopausal women with regular menstruation. However, a significant reduction of HDL was present in the postmenopausal group ($p < 0.001$) than the premenopausal group. Therefore, it can be concluded that menopause leads to changes in lipid profile by increasing total and LDL cholesterol and by reducing HDL cholesterol.¹¹

In-Kyong Jeong et al hypothesized that an atherogenic lipid profile might be associated with lower bone mineral density (BMD), the previous results are controversial. We investigated the association between lipid profile and BMD in premenopausal and postmenopausal women in a large Korean population. This study considered 10,402 women who underwent measurements of lipid profile and BMD from October 2003 to October 2005 at Healthcare System Gangnam Center, Seoul National University Hospital. They conclude that although there were some weak associations between lipid profiles and BMD, the results of this study hardly support the hypothesis that an atherogenic lipid profile is associated with osteoporosis.¹²

Mesalić L et al analyzed the influence of menopause on the concentrations of lipids, lipoproteins and, the influence of estradiol, progesterone, FSH, LH on lipid profile in menopausal women as well. The menopausal women had higher but non-significant concentrations of total cholesterol, VLDL, LDL, and triglycerides than women with regular menstruation. The concentration of HDL was significantly lower in menopausal women than in women with regular menstruation. Also, the concentration of apolipoprotein B was significantly higher in menopausal women, but the concentrations of apolipoprotein and lipoprotein (a) were lower but without significance. Estrogen concentration has significant negative correlation with VLDL and triglycerides and significant positive correlation with HDL in menopausal women. Progesterone concentration has shown no correlation with concentrations of lipids and lipoproteins in menopause. They concluded that menopause leads to changes in lipid profile by reducing HDL, and elevating apolipoprotein B levels, thus increasing the risk for cardiovascular disease. These changes were caused by reduction of estrogen concentrations in menopause.¹³

CONCLUSION

Within the limitations of the present study, it can be concluded that post-menopausal women are at more risk of cardiovascular diseases as compared to premenopausal women.

REFERENCE

1. Couderc R, Machi M. Lipoprotein(a): risk factor for atherosclerotic vascular disease important to take into account in practice. *Ann-Biol-Clin.* 1999;57(2):157-67.

2. Rich-Edward JW, Manson JE, Henkeni CH. The Primary prevention of coronary heart disease in women. *N. Engl. J Med.* 1995;332(20):1758–66.
3. Adami S, Braga V, Zamboni M, Gatti D, Rossini M, Bakri J, Battaglia E (2004) Relationship between lipids and bone mass in 2 cohorts of healthy women and men. *Calcif Tissue Int* 74: 136–142 10.
4. Brownbill RA, Ilich JZ (2006) Lipid profile and bone paradox: higher serum lipids are associated with higher bone mineral density in postmenopausal women. *J Womens Health (Larchmt)* 15:261–270 11.
5. Cui LH, Shin MH, Chung EK, Lee YH, Kweon SS, Park KS, Choi JS (2005) Association between bone mineral densities and serum lipid profiles of pre- and postmenopausal rural women in South Korea. *Osteoporos Int* 16:1975–1981
6. Anonymous. Executive summary of the third report of the National Cholesterol Education Program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (adult treatment panel III) *Journal of the American Medical Association.* 2001;285(19):2486–2497.
7. Anonymous. Third report of the National Cholesterol Education Program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (adult treatment panel III) final report. *Circulation.* 2002;106(25):3143–3421.
8. Davis C, Pajak A, Rywik S, et al. Natural menopause and cardiovascular disease risk factors: the Poland and US Collaborative Study on Cardiovascular Disease Epidemiology. *Ann Epidemiol.* 1994;4(6):445–448.
9. Bonithon-Kopp C, Scarabin PY, Darne B, et al. Menopause-related changes in lipoproteins and some other cardiovascular risk factors. *Int J Epidemiol.* 1990;19(1):42–48.
10. Wang N, Qin MZ, Cui J. [Lipid profile comparison between pre- and post-menopausal women]. *Zhonghua Xin Xue Guan Bing Za Zhi.* 2016 Sep 24;44(9):799-804. Chinese. doi: 10.3760/cma.j.issn.0253-3758.2016.09.013. PMID: 27667280.
11. Saha KR, Rahman MM, Paul AR, Das S, Haque S, Jafrin W, Mia AR. Changes in lipid profile of postmenopausal women. *Mymensingh Med J.* 2013 Oct;22(4):706-11. PMID: 24292300.
12. Jeong IK, Cho SW, Kim SW, Choi HJ, Park KS, Kim SY, Lee HK, Cho SH, Oh BH, Shin CS. Lipid profiles and bone mineral density in pre- and postmenopausal women in Korea. *Calcif Tissue Int.* 2010 Dec;87(6):507-12. doi: 10.1007/s00223-010-9427-3. Epub 2010 Oct 27. PMID: 20976443.
13. Mesalić L, Tupković E, Kendić S, Balić D. Correlation between hormonal and lipid status in women in menopause. *Bosn J Basic Med Sci.* 2008;8(2):188-192. doi:10.17305/bjbm.2008.2980