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A COMPARATIVE STUDY OF LIPID PROFILE AND OESTRADIOL IN PRE-AND POST-MENOPAUSE WOMEN

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Abstract

Menopause, characterized by the permanent cessation of menstruation due to ovarian activity decline, has been associated with an increased risk of cardiovascular disease in women. This study aimed to investigate the effects of menopause on lipid profile changes and their potential correlation with estrogen levels. A quantitative approach with a descriptive research design was employed, utilizing purposive sampling. The study comprised a total of 100 participants, including 50 pre-menopausal and 50 post-menopausal women. The findings revealed significant decreases in estradiol levels, high-density lipoprotein (HDL), and triglycerides, while total cholesterol and low-density lipoprotein (LDL) levels showed significant increases among post-menopausal women. The observed changes in lipid profile were found to be directly correlated with estrogen fluctuations. Consequently, menopause poses an elevated risk for coronary heart diseases due to the increase in total cholesterol and LDL levels, coupled with a decline in HDL levels. These findings emphasize the importance of monitoring lipid profiles and managing cardiovascular risk factors in menopausal women.

Keywords: Pre-Menopause, Post Menopause, Estradiol ,Lipid Profile.

INTRODUCTION

In the modern world, a woman will live for around one-third of her life beyond menopause (Rossouw JE, 2002) .The ovaries stop producing substantial amounts of oestrogen after menopause. Therefore, the effects of oestrogen deficiency-related symptoms and diseases on women's health are becoming most important.(Wang N ,2016. Mumford, S. L et.al. 2010 .) Memory, attention, and cognitive dysfunction are psychopathological conditions which most commonly occur after menopause (Rabeya, K.,et al, 2021).Before the onset of menopause, studies have shown that women have a lower risk of developing cardiovascular disease than men, but this advantage disappears after menopause.According to data from the Framingham Study, beyond age 45, females' coronary heart disease (CHD) morbidity rates increase more quickly than males' do.The majority of women are less aware of how menopausal symptoms affect their quality of life. During menopause, women move from being fertile to being infertile. estrogenProduction decreases significantly after menopause. in the vicinity Conversion of adrenal androgens. It occurs primarily in adipose tissue, liver, and estrogen levels drop in postmenopausal women.Improves

overall health by causingphysiological, biochemical and structural changes.The body's metabolism is greatly affected.Fat metabolism is affected by estrogen levels. Changes in serum lipids Lipoprotein levels indirectly lead to coronary artery disease, which determines thisLife expectancy for postmenopausal women.(Varu, D. 2012.) According to WHO menopause is defined as the permanent cessation of menstruation as a result of the loss of ovarian activity.(.Reddy Kilim S, 2013.)

Menstruation permanently stops occurring at the physiological process known as menopause.(Sivapriya A. 2017) The main cause of menopause is the exhaustion of the ovary's reserves of oocytes or primordial follicles, which results in a decrease in oestrogen and progesterone output and the termination of cyclical endometrial growth and menstruation (Swarnalatha, P. 2008.) Menopause most frequently affected women between the ages of 48 and 55. Estradiol and estrone concentrations in the blood have sharply decreased. connected to menopause, which may have an effect on how the central nervous system functions. The most prevalent and conspicuous signs of ovarian hormone loss are hot flashes, osteoporosis, and an elevated risk of cardiovascular illnesses.(Mešalić ,2008. Kumari, P.2018.)

Ovarian function declines after menopause. As a result, the metabolism of glucose and insulin is adversely affected, as is the distribution of body fat, coagulation, fibrinolysis, malfunction of the vascular endothelium, and the lipoprotein profile. research on surgically inducing menopause and epidemiological research analysing premenopausal and postmenopausal women have both discovered atherogenic changes in lipid and lipoprotein profiles(14)Arteriosclerosis (the buildup of fatty plaques on artery walls) is a risk factor for CHD.(Gilligan D, 1994. Kanwar, 2014) .Metabolic circumstances have an impact on lipid profiles, and changes in lipid metabolism have been linked to atherosclerosis and coronary heart disease (Usoro, 2006 .Couderc R, 1999) it is an equally important cause of death and disability among older women. By the age of 60 years, only 1 in 17 women in the United States has had a coronary event, as compared with 1 in 5 men(Rich-Edward ,1994, .Lerner DJ,1986.) The sex gap in morbidity tends to diminish during the later years of the age range, mainly because of a surge in growth of female morbidity after age 45 years, while by that age, the growth in the male rate begins to taper off. (Fatima Y ,2017).Postmenopausal women are believed to have a higher risk of coronary artery disease than premenopausal women.(Jan L, 2007, Matthews KA, 1989. Yeasmin M,2017).

MATERIAL AND METHODS

The quantitative approach with descriptive research design was used for the present study. After obtaining ethical clearance from the Institutional Ethical Committee (IC) of Saveetha Institute Of Medical And Technical Sciences and formal permission from hospital health authorities, the study was conducted. A total of 100 women, including 50 pre-menopause women and 50 post-menopause , who meet the inclusion criteria was selected by using purposive sampling technique as the study participants. The inclusion criteria for the study participants was the women who Age group between 35 and above, women who attend menopause, Post-menopause women who had cessation of menstruation for minimum of one year ,Premenopausal women who had regular menstruation. The exclusion criteria for the study participants were women Women under Hormone Replacement Therapy, Women with known case of congenital and acquired heart diseases,Women with Systemic diseases -

Hypertension, Diabetes mellitus, Hepatic and Metabolic diseases, Women with Chronic drug intake like Rifampicin, Phenytoin, Anticoagulants, Statins etc.Women with Thyroid dysfunction. The demographic data were collected. Blood is drawn from the antecubital vein at the front of the forearm after the patient has been fasting for 10–12 hours. A 5ml disposable syringe is used to collect about 3ml of blood. For serum separation, After letting the blood clot at room temperature in a glass tube, it is centrifuged. To determine the serum oestradiol and lipid profile, this separated serum is employed. Finally the subjects serum level report was collected. The data collected were than coded and entered in Excel for further data analysis and interpretation.

RESULT AND DISCUSSION

Table 1: Frequency and percentage distribution of demographic variables of the pre and post menopause women

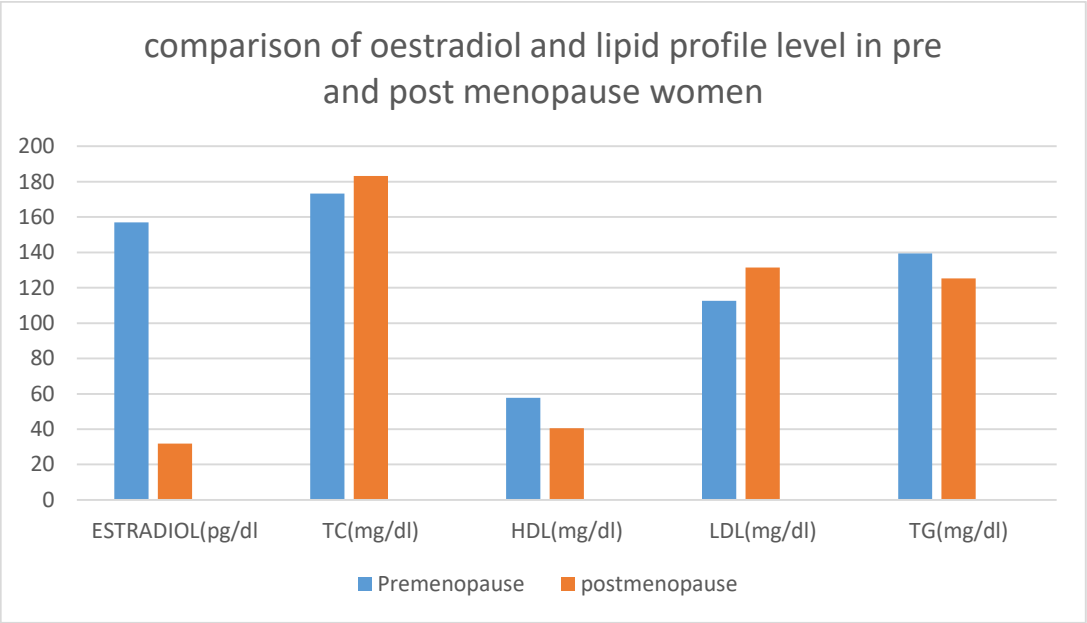
Demographic Variables	GROUP–A Frequency(f) and Percentage (%) n=50	GROUP-B Frequency(f) and Percentage (%)n=50
Age in years		
35-40	23(23)	
40-45	26(26)	9(9)
45-50	1(1)	18(18)
50years and above		22(22)
Diet pattern		
Vegetarian	14(14)	12(12)
Non- vegetarian	36(36)	38(38)
Type of menopause		
Natural	50(50)	42(42)
Surgical		8(8)
Duration of menopause		
Less than one year	-	15(15)
Women with more than one year	-	35(35)
Women who had regular menstruation	50(50)	
Women with history of cardiovascular disease		
Yes	-	-
No	50(50)	50(50)
Women with history of diabetes mellitus		
Yes	-	-
No	50(50)	50(50)
Women with history of surgery		
Yes	-	8(8)
No	50(50)	42(42)
Women with history of any drug intake		
Yes	-	-
No	50(50)	50(50)
Women with history of endocrine disorder		
Yes	-	-
No	50(50)	50(50)

Table 2: Comparıson of Oestradıol Levevl Between Two Groups

Group	OESTRADIOL (pg/ml) Mean	Standard deviation	Student's Paired T-Test
GROUP-1	156.88	45.9	t=18.53 p<0.10**
GROUP-2	31.83	12.91	DF=49 Significant

Table 3: Comparıson of Lıpıd Profıle Levevl Between Two Groups

Parameter	Group-1 (MEAN)	Group-1 (SD)	Group-2 (MEAN)	Group-2 (SD)	P value
Total cholesterol(mg/dl)	173.19	43.77	183.19	31.24	p<0.10**
High Density Lipoprotein(mg/dl)	57.74	14.57	40.48	8.301	p<0.10**
Low Density Lipoprotein(mg/dl)	112.56	28.56	131.50	14.57	p<0.10**
Triglycerides(mg/dl)	139.33	39.01	125.23	12.91	p<0.10**



After menopause, the lipid profile changes that take place are linked to an increased risk of cardiovascular diseaseThe result of the study is the level of oestradiol (pg/ml) in postmenopausal women was significantly reduced relative to that İn premenopausal women. (p<0.10). While comparing the mean values of the lipid profile between the two groups, in postmenopausal women, the levels of high-density lipoprotein and triglycerides decreased significantly with pre-meopause women. There is a significant increase in total cholesterol and low-density lipoprotein in postmenopausal women when compared to premenopausal women.

Our result was compared to the **Prajakta Warjukar (2020**) analysis. In postmenopausal women, discovered a significant rise in serum levels of total cholesterol (TC), triglycerides (TG), LDL cholesterol, and VLDL cholesterol compared to those in premenopausal women (p<0.001). In comparison to premenopausal women, postmenopausal women had significantly lower levels of HDL cholesterol (p<0.001).Premenopausal women's estradiol concentration was found to be significantly greater (p<0.001) than postmenopausal women's. .In the **Yeasmin(2017)** trial, postmenopausal women's serum oestrogen levels were lower than those of premenopausal women, and this difference was statistically significant (p< 0.001).This study revealed that pre-menopause women had considerably higher serum oestrogen levels than post-menopause women, with a p-value of 0.001.(23)In our study,

Pearson's correlation found that in both pre-menopause and post-menopause women, there is a negative correlation between serum oestradiol level and the values of body mass index, total cholesterol, low density lipoprotein, very low density lipoprotein, and triglycerides. There is a positive correlation between serum oestradiol levels and high-density lipoproteins.(Kannel, WB,1987). According to the study conducted by **Swarnalatha P K** In postmenopausal ($p<0.01$) as compared to premenopausal ($p<0.01$) women with less than 10 years of menopause, the correlation between oestrogen level and HDL cholesterol was found to have significantly decreased, whereas there was no significant correlation in postmenopausal ($p<0.01$) women with less than 10 years of menopause. (Lobo RA.,1991).

Ethical statement; The study was approved by the institution's ethical committee at the Saveetha Institute of Medical and Technical Sciences. (Ethical certificate no 001/2023/IEC/SMCH) All the participants signed an informed consent form in both English and their native language (Tamil) as per their familiarity.

CONCLUSION

Based on these findings, it can be concluded that women in the post-menopausal stage are at an increased risk of developing coronary heart disease. The rise in total cholesterol and LDL, along with the decrease in protective HDL levels, may contribute to the higher cardiovascular disease risk observed in this population.These findings emphasize the importance of early identification and effective management of cardiovascular risk factors among menopausal women. Implementing preventive strategies, such as lifestyle modifications and hormone replacement therapy, may help mitigate the adverse effects of menopause on cardiovascular health and improve long-term outcomes for women transitioning through this stage of life.

Declaration of Interest: Nil

Funding Agency: Nil

Author Contribution: Sathiyabama formulated concept, and designed the study ,Data collection and curation data analysis done by Manisha,Hemavathy and Sathiyabama.Finally manuscript drawn and critically reviewed the results of the study and all authors accepted for publication of the study .

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