|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
PubMed (National Library of Medicine ID: 101738825)
Index Copernicus Value 2018: 75.71
Original Research Article Volume 3, Issue 9; September: 2019; Page No. 142-145

STUDY OF SERUM LIPID PROFILE IN REPRODUCTIVE AND POST MENOPAUSAL WOMEN.

[1]Dr. Chanchal Shrivastav, [2*]Dr. Akshay Berad, [3]Dr. Paras Arvindbhai Parekh
[1]Associate Professor, Dept. of Physiology, Ananta Institute of Medical Sciences and Research Center, Rajsamand, Rajasthan.
[2*]Associate Professor, Dept. of Physiology, RIMS, Adilabad, Telangana, India.
[3]Associate Professor, Dept. of Physiology, Ananta Institute of Medical Sciences and Research Center, Rajsamand, Rajasthan.

Article Info: Received 22 August 2019; Accepted 20 September. 2019
DOI: https://doi.org/10.32553/ijmbs.v3i9.551
Corresponding author: Dr. Akshay Berad
Conflict of interest: No conflict of interest.

Abstract

According to WHO estimates, 16.7 million people around the globe die of cardiovascular disease each year. Economic transition, urbanization, industrialization and globalization bring about life style changes that promote heart disease. High blood pressure, high cholesterol and obesity are likely to become more prevalent in developing countries. Increased energy intake and sedentary lifestyle are also responsible for heart disease. The presence of one or more cardiovascular risk factors like high levels of TC, LDL, TG, glucose, insulin, BMI and a decreased HDL have been found to increase the progression of prehypertension to hypertension. Prehypertension increases the risk of MI and CAD. The present study was undertaken to know serum lipid profile changes in reproductive and postmenopausal women. Total 60 Subjects of age group 20-45years (reproductive), 46-60years (postmenopausal) female volunteered for our study. During the study period, BMI, Lipid profile, parameters were recorded in all the subjects. In BMI, TC, LDL, VLDL, TG, is gradually increased, HDL is gradually decreased from reproductive age women to post menopausal women. Dyslipidemia occurs due to multifactorial reasons like physical activity, life style, diet, smoking, alcohol consumption, ethnicity and genetic makeup. Post-menopausal women are at increased risk of developing cardiovascular disease due to change in the lipid pattern and loss of cardioprotective effect of estrogen. Predicting the factors affecting the lipid profile in post-menopausal women, adopting strategies to control these mechanisms by modifying the relative risk factors during menopausal transition may improve the cardiovascular risk profile in these women.

Keyword: Lipid profile, Menopause, Reproductive age group.

Introduction:

Menopause is the cessation of menstrual cycle in women. It represents a transitional phase in the natural biological woman's age, a natural event that marks the end of the reproductive years of women in terms of the menstrual cycle permanently stopped and the resulting stop ovarian function in females [1]. Most of the women at this stage suffer from a variety of symptoms due to hormonal changes and these symptoms are possible to be severe and frequent, some women have more severe symptoms and others do not suffer from any symptoms at all [2]. Menopause is an oestrogen deficient state characterised by permanent amenorrhoea lasting for a period of 1 year due to the cessation of ovarian functions.[3] There is considerable variation in the level of estrogen in postmenopausal women occurs during the early postmenopausal years because of continued secretion of estradiol from the ovary and conversion of androstenedione to estrone in fat tissue.[4] In young women, where oestrogen production is high, serum lipids are normal but after menopause, lipid levels are increased resulting in increased incidence of coronary heart diseases. This shows the possible relationship among oestrogen, normal lipid profile and atherosclerosis and the relative immunity to coronary artery diseases (CAD).[5] Natural menopause confers a 3 fold increase in CAD risk and postmenopausal women account for > 30% of the female population at risk for CAD in India.[6,7]. Circulating Serum Cholesterol, Low Cholesterol (LDL-C) and Serum Triglycerides are major

risk factors of this disease. The incidence of cardiovascular disease after menopause may partly be due to changes in the plasma lipid level that occurs following menopause.(8,9) The modification of profile may be important both in the prevention and control of coronary heart disease(10) . Estrogen leads to the increased risk of cardiovascular diseases after menopause, as evidenced by reduction in the cardiovascular diseases after hormone replacement therapy. Estrogen replacement therapy, through an effect on the blood vessel wall and on serum lipids, also appears to stabilize existing atherosclerotic plaques. Antithrombotic therapy, exercise and smoking cessation also contribute to reduced risk of cardiovascular disease in older women(11). In order to contribute to the better understanding of lipid profile status in postmenopausal women, the present study was conducted to estimate the serum levels of total cholesterol (TC), triglyceride (TG),high density lipoprotein cholesterol (HDL-C), low density lipoprotein cholesterol (LDL-C), very low density lipoprotein cholesterol (VLDL-C), and atherogenic index and compare it with premenopausal women.

Material and Methods:

The present study was undertaken to know serum lipid profile changes in reproductive and postmenopausal women. Healthy subjects with no evidence of metabolic or endocrinal abnormalities, hypertension or coronary heart disease were selected randomly for reproductive and post menopausal age group consisting of 30 subjects in each group .Total 60 Subjects of age group 20-45years (reproductive), 46-60 years (postmenopausal) female volunteered for our study. During the study period, anthropometric, biochemical dietary intake and physical activity and parameters were recorded in all the subjects.

Study Design

Study groups includes

Group-1: 30 Reproductive age women

Group-2: 30 Postmenopausal women

Inclusion Criteria:

Suitable subjects, who accept to take part in this research,

Subjects with no history of any chronic disorder,

Reproductive age women with a history of regular menstrual cycle.

Exclusion Criteria

The following subjects are excluded from the study:

Smokers, Alcoholics,Obese individuals those who are on exogenous hormone replacement therapy or lipid lowering drugs

Subjects with the following chronic disorders are also excluded:

- Cardiovascular disease and hypertension,

- Diabetes mellitus, •

- Hepatic, thyroid, renal, and gall bladder diseases

Measurement of biochemical parameters:

Venous blood samples (5 ml) were collected from 60 subjects after an overnight fast for determination serum lipid profile. The serum was separated within 2 hours of blood collection using a centrifuge at 1000 rpm for about 20 minutes at room temperature. Estimation of Total cholesterol (TC) ,Triglycerides(TG) and (High densitylipoprotein)HDL was carried out using enzymatic method. Low density lipoprotein (LDL), VLDL were also estimated. BMI was calculated (measured as weight in kilograms divided by square of height in meters). Lipid profile was compared in 2 groups. The data collected in this study was analyzed statistically by computing the descriptive statistics viz .mean, standard deviation, The 'P' value ≤ 0.05 was considered as statistically significant.

Results:

Table 1: Shows the mean, standard deviation, for age difference in 2 age groups.

Age	Reproductive age group (20-45 years) n=30	Post menopausal age group (46-60) n=30
Mean	33.24	54.33
Standard Deviation	6.90	2.27

Table 2: shows values of Lipid profile parameters in Reproductive age group and Post menopausal age group

Parameters	Post menopausal age group (46-60 years) n=30		Reproductive age group (20-45 years) n=30		P value
	Mean	SD	Mean	SD	
BMI	25.74	2.88	23.11	2.64	0.0005095
TC mg%	206.53	59.84	170.3	36.34	0.0063077
HDL mg%	43.13	6.49	55.33	41.27	0.1151860
LDL mg%	124.43	70.24	102.63	27.48	0.1188853
VLDL mg%	35.6	10.65	25.5	6.94	< 0.00001
TG mg%	162.76	68.01	129	33.98	0.0180973

In both groups from reproductive to post menopausal women BMI, TC, LDL, VLDL, TG, is gradually increased. HDL is gradually decreased from reproductive to post menopausal women, it is statistically significant.

Discussion

In the present study there was a significant difference in BMI, TC, LDL, HDL, VLDL ,TG, Diet, physical activity with significant p value of <0.05 Estrogen has a beneficial effect on lipid metabolism .Estrogen reduces the degradation of HDL by inhibiting the enzymatic action of lipoprotein lipase. So in the presence of estrogen there will be more amount of HDL in the reproductive women. Ovaries are the only source for estrogen in the women and these ovaries become inactivated and the source of estrogen is reduced in the postmenopausal women. So the postmenopausal women have more degradation of HDL when compare to reproductive women so the HDL levels are decreased in the post menopausal women. Post menopausal women had higher had higher TC, and lower HDL levels. **Goswami K and Bandyopadhyay A** showed that HDL cholesterol was significantly decreased in post menopausal women and significant rise in TC and LDL –cholesterol[12]. **Gandhi BM** showed Triglycerides in plasma increased with age [13]. **Bonithon-kopp** concluded that total cholesterol and LDL cholesterol significantly increased in postmenopausal women[14]. **Nerbrand et al, smiti nanda et al** suggested that loss of endogenous sex steroids contribute substantially to increased atherogenic lipid profile[15]. **Bhagya et al** concluded that total cholesterol increases significantly with age and the significant rise in LDL is mainly due to hormonal levels in post menopausal women[16]. Our study group being otherwise normal subjects .Assessing the presence of major CVD risk factors in women of particular importance, since it would allow us to promptly identify persons at high risk for development of clinical CVD later in life. We concluded the presence of normal lipid profiles and Cardio protective HDL is normally higher in prepubertal females. Lower levels of HDL increases CVD risk. This can be attributed mainly to sedentary life style, stress and dietary habits this is seen in post menopausal women.

Conclusion:

From our study it is evident that the mean values of total Cholesterol, LDL were higher and HDL was lower in menopausal women due to estrogen deficiency when compared with reproductive age group women. Dyslipidemia occurs due to multifactorial reasons like physical activity, life style, diet, smoking, alcohol consumption, ethnicity and genetic makeup. So further extensive studies with importance to the duration following menopause need to be done to understand the underlying mechanism

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