

Lipid Profile in Postmenopausal women of Hubli city

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Abstract :

Objective: The present study is aimed at comparing the levels of cholesterol in premenopausal with that of their postmenopausal women.

Materials And Methods: Investigations were carried out in 50 post menopausal healthy women aged 50 to 55 yrs., Fifty premenopausal healthy women aged 35-40yrs with height and weight matched as controls. Data were obtained via comprehensive questionnaire.

Results: There was statistically significant increase in Blood pressure, total cholesterol, LDL-C. No statistically significant change was seen in HDL-C, VLDL-C and Atherogenic Index compared to controls in this study.

Conclusion: Although natural menopause does not cause an immediate increase in heart disease, it does signal a period of increasing risk. It is probably related to both age and estrogen deficiency. Total cholesterol and LDL-C was increased in our study which has been attributed to hormonal changes and failure of follicular development. The plasma estradiol levels falls below the levels that is seen in premenopausal women. HDL-C and VLDL-C are not affected in our study because probably, these women were not sedentary workers and were non diabetic, non hypertensive and non obese.

Keywords: Lipid Profile, Post-menopausal, Coronary artery disease.

Introduction:

Menopause is a natural event as the age advances and signifies the end of reproductive years with cessation of cyclic ovarian functions. It is heralded by menopausal transition, a period when the endocrine, biological and clinical features of approaching menopause begins¹. Lack of the protection of estrogen has been the major reason. However, several physiological changes which develop during menopause may also influence the risk of cardiovascular disease, such as ageing, increased obesity or android pattern of body fat distribution, decreasing resting metabolic rate and physical activity².

The hormonal changes associated with menopause i.e low plasma levels of estrogen and marked increase in luteinizing and follicle stimulating hormone levels exert a significant effect on the metabolism of plasma lipids and lipoproteins¹. Earlier studies in western countries have shown that there is an alteration in lipid profile changes. There is an increased risk of coronary artery disease to women after menopause based on their life style, smoking, alcohol consumption, physical activities, food habits, working hours, and stress.

The present study is being done to know that whether the

similar lipid profile changes occur in our region of postmenopausal women considering their life style, working hours, food habits and physical activities.

Early identification of alterations in these biochemical parameters can aid in the effective planning. Early application of preventive and therapeutic measures can reduce morbidity and mortality.

Materials and Methods:

This study was conducted in the Department of Physiology, KIMS, Hubli with the assistance of laboratory setup of the department of Biochemistry, with ethical clearance from Institutional ethical committee.

The study was done by obtaining serum sample from study group and controls, from randomly selected postmenopausal and premenopausal women of similar height and weight of general population of Hubli city. Some were employees of KIMS Hospital. The samples were drawn between 7AM-10AM under aseptic precautions after an overnight fast in order to avoid changes due to diurnal variation. 75 subjects (postmenopausal women) and 60 control group (premenopausal women) were enrolled in this study. Only 50 postmenopausal women and 50 premenopausal women were included after a detailed medical history and were selected on the basis of the below mentioned inclusion and exclusion criteria. Some subjects were on mixed diet and some were vegetarians. Postmenopausal state was considered in women who had at least 12 months amenorrhea.

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They were recruited in the study after obtaining consent on printed proforma. On the day of the enrollment, the subjects were narrated fully about the protocol of the study

Inclusion Criteria: Women who had active physical life, 50 healthy naturally attained post menopausal women, Age 50 - 55 yrs, Height 155-157.5 cms, Weight 60-65 kgs. 50 normal healthy height and weight matched premenopausal women with regular menstrual cycles are taken as control group of age 35 to 40 yrs.

Exclusion Criteria: History of smoking, History of any blood disorders, History of surgical menopause, previous history of cardiovascular diseases, hypertension, diabetes mellitus, renal diseases, thyroid disorders, dyslipidemia, Other medication except for vitamins, & Calcium and those on hormonal or supportive treatment for menopause.

Statistical analysis was done by students 't' test.

Methods: The collection of the samples was done after an overnight fast. They were advised to have their normal daily diet and follow the routine.

Anthropometric data: Measurements were taken while subjects were relaxed, standing erect and had their arms at their sides and feet together. Height and weight was recorded.

Body height was measured by Wall mounted stadiometer. Body weight was recorded by clinical weighing machine, subjects dressed in light clothes and no shoes.

BMI was calculated as per formula: Weight (Kg)/Height (meter)² (Quetelet,s Index).

Vital parameters like pulse rate, BP were recorded. Blood pressure was measured by Mercury Sphygmomanometer.

The subjects and controls were measured in supine position or sitting position first by palpatory method and then by auscultatory method. According to Korotkoff sounds, appearance of sound (phase I) is taken as Systolic BP, and disappearance of (phase V) Korotkoff sound is taken as Diastolic BP. Lipid profile was done in biochemistry laboratory

Collection of data.

- Proforma are given to all postmenopausal and premenopausal women.
- The subject of similar weight and height range are randomly selected from women population of Hubli city.
- Written consents are obtained during the face to face questionnaire interview.
- Height and weight of each individual was recorded, BMI was calculated.

- Vital parameter like pulse rate, BP was recorded. A detailed examination of respiratory, cardiovascular, central nervous system and gynecological examination was done.

- After selecting the subjects and controls, appointment was scheduled in prior and they were requested to do an overnight fasting prior to the day of the test to get fasting blood sample for lipid profile analysis. Between 7am to 10am, 2ml of venous blood was collected in a plain bulb.

- Serum lipid profile was analyzed in Biochemistry clinical Lab, in KIMS, Hubli, with clinical chemistry Analyzer (Type Model: XL-300 ERBA).

Atherogenic Index : This index estimates the values of Plasma (AIP = Log(TG/HDL_C)) and “the zone of atherogenic risk”. Triglycerides(TG) and HDL-cholesterol in AIP reflect the balance between the atherogenic and protective lipoproteins. The index correlates with the size of pro- and antiatherogenic lipoprotein particles.

Results

Body Mass Index [BMI]

There was no statistical difference in BMI between the two groups.

Table No 1: Anthropometric data of Study groups and Controls

Parameters	Study group [Mean ± SD]	Controls [Mean ±SD]	't' value	'p' value	Significance
Height (mtr)	1.554±.0105	1.553±.009	.610	>0.05	NS
Weight (kg)	61.60± 1.92	62.10± 2.13	1.231	>0.05	NS
BMI (kg/m ²)	25.50± 0.789	25.75± 0.916	1.454	>0.05	NS

Lipid Profile :

The lipid profile data of study subjects and controls are shown in table.

Table : Lipid Profile Parameters of Study Subjects and Controls.

Parameters	Study group [Mean ± SD]	Controls [Mean ±SD]	't' value	'p' value	Significance
Serum Total Cholesterol (mg/ dl)	183.0±47.92	153.22±26.1	3.85	<0.001	HS
Serum TriGlycerides (mg/dl)	149.80±72.1	126.82±50.48	1.846	>0.05	NS
LDL-C (mg/dl)	108.76±46.4	82.31±20.52	3.67	<0.001	HS
VLDL-C (mg/ dl)	30.00±14.47	25.35±10.10	1.85	>0.05	NS
HDL-C (mg/dl)	44.74±14.14	45.72±9.61	.405	>0.05	NS
Atherogenic Index	4.832±3.326	4.21±1.005	1.25	>0.05	NS

Discussion

Lipid profile changes

In our study Serum Total cholesterol and LDL-C was highly significant. HDL-C and Atherogenic Index was not statistically significant in postmenopausal women when compared to premenopausal women.

1. **Serum Total Cholesterol:** Serum Total cholesterol was increased significantly in postmenopausal women compared to premenopausal women. This may be due to the estrogen deficiency that raises total cholesterol, lipoproteins levels providing lipid profile highly favorable to atherogenic potential.
2. **LDL-C:** LDL-C showed statistically significant increase in postmenopausal women. The development of CAD is a function of the particle size of LDL-C and HDL-C, with small particle size exhibiting great atherogenic potential.
3. **HDL-C:** HDL-C was not increased and statistically not significant. But there are slightly numerical higher levels of HDL-C in premenopausal women compared to postmenopausal women.
4. **Atherogenic Index:** Although the difference in Atherogenic Index did not show statistically significant values, as menopause progressed. The absolute values indicate the first decade of menopause is associated with low risk, while second decade is associated with medium risk of CAD.

These findings were consistent with Berg, et al (2004),³ who also demonstrated higher total cholesterol, LDL-C and triglycerides in menopausal transition and postmenopausal women in comparison with premenopausal women. A similar observation was also made by Carr, et al (2000),⁴ in postmenopausal Caucasians. Their data on HDLC have been consistent as HDL-C has been reported to remain unaffected (Jenson, et al 1990).⁵

Natural menopause did not affect BP, Plasma glucose, insulin levels, diet, or kilojoules expended in physical activity. Postmenopausal women had higher levels of total-cholesterol, LDL-C and triglycerides. HDL-C did not differ with menopausal status (BA Gower, et al 1998)⁶. Zhou JL, et al (2010)⁷, who suggested that menopause transition instead of menopause perse is associated with serum lipid profile change observed in community based women in China.

FJ Sa ´nchez-Muniz, et al(2003)⁸, in their nutritional assessment, health markers and lipoprotein profile in postmenopausal women of Spain showed that there was an increase in total cholesterol ,LDL-C ,HDL-C. Their values were compatible with the characteristics of the diet, adjusted to energy expenditure and with an

adequate fatty acid profile, high intake of oleic acid has been related to high levels of HDL-cholesterol. The high consumption of n3PUFA enriched foods (e.g. n-3 PUFA eggs, n-3PUFA milk) were present in their diet for decades. The high consumption of fruits, vegetables and vegetable oils implied a high intake of tocopherol, carotenes and minor compounds with antioxidant properties conferring a low peroxide status and thus decreasing the CHD risk in this population.

Eun Jeung Cho, et al (2011)⁹, did a study on Korean post menopausal women, there were no changes observed in premenopausal and postmenopausal women. Body weight, blood pressure, HDL-C, and triglycerides did not change in any of the groups. In all women, changes in both total cholesterol and LDL cholesterol were associated with changes in follicle stimulating hormone. Milagros T, et al (2007)¹⁰, did study on dyslipidemia in Filipino postmenopausal women. They found increase in total cholesterol, LDL-C and HDL-C was not significant.

A lower atherogenic index indicates a greater proportion of HDL-C, and is a measure of risk for coronary heart disease. Dr. Zafar, et al (2007)¹¹, it was observed that postmenopausal women are at higher risk of development of CAD even with no deviation of lipid profile from the normal physiological values, because obesity, increased W-H ratio and hypertension are potent factors even with normal lipid profile for development of atherosclerosis in postmenopausal women.

Conclusion: The hormonal changes associated with menopause exert a significant effect on the metabolism of plasma lipids.

The present study is being done to know that whether the above mentioned changes occur in our region of postmenopausal women considering their life style, working hours, food habits and physical activities.

Early identification, effective planning and early application of preventive therapeutic measures help to reduce morbidity, mortality and psychological effects that lead to happy ageing days ahead.

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