A Duration Based Study Of Lipid Profile Status & Associated Changes In The Left Ventricular Function Of Postmenopausal Women

M Muhil, U Sembian, Babitha, T Meena

ABSTRACT

Aim: Menopause is the phase of declined ovarian activity & fall in estrogen level. Since there is an increased risk of cardiovascular diseases for women after menopause, the present study was carried out to evaluate the lipid profile status and associated changes in the left ventricular function in Postmenopausal women. **Design-:** Descriptive Study. **Setting:** 100 Postmenopausal were selected for study group, they are sub grouped into Postmenopausal <5years (N=50),Postmenopausal>5years (N=50), according to the number of years attained after menopause. Normal reproductive age group women (N50) were selected as control. **Materials & Methods:** For both the study groups & control, we have measured Body Mass Index ,Waist-Hip Circumference Ratio, Blood lipid profile including Total cholesterol, Triglycerides, Low density lipoprotein (LDL) & High density Lipoprotein (HDL).The Lipid parameters have been estimated by Enzymatic calorimetric method. The contractility indices of Left ventricular function like Fractional Shortening, Ejection Fraction & Left ventricular mass index were assessed by M-Mode Echocardiography. **Statistical Analysis: Statistical analysis** was done by one way ANOVA test. **Results:** BMI, W/H Ratio, were found elevated in both the sub groups menopausal women <5 years and >5 years. Among the lipid profile, Total cholesterol is elevated significantly ($P < 0.05$), in both the sub groups. In Postmenopausal women - > 5 years, LDL cholesterol value was significantly elevated than Postmenopausal <5 years & control. Echocardiographic findings revealed that there is a significant reduction of Fractional shortening in & Postmenopausal ->5years. **Conclusion:** Postmenopausal women of longer duration (>5years), the LDL Cholesterol significantly raised, the LV Functions shows significant negative correlation.

The derangement in lipid profile status is observed markedly in postmenopausal women of longer duration and the LV function significantly and negatively correlates to the lipid profile status in those postmenopausal women > 5 years.

Key Words: Lipid profile, Left ventricular function, M-Mode echocardiography, Postmenopausal women

INTRODUCTION

Menopause is the phase of ageing process during which a women passes from the reproductive to non-reproductive stage [1]. Although the risk of death is lower in women than men before menopause, the relative risk due to cardiovascular problem for women increases after menopause [2], [3]. The time of menopause is determined genetically and occurs at a median age of 51 years. Since the women of 50 can expect to live another 35 years, a large portion of the female population is without ovarian function and live above one third of their lives after this function ceases, as post menstrual age. The Cardiovascular diseases account for more than 50% of all deaths in women over 50 years of age [4]. So this study has been undertaken to evaluate the changes in the lipid profile status after menopause and to find out associated changes in the left ventricular functions in Postmenopausal women.

MATERIALS AND METHODS

The study group consists of 100 normal Postmenopausal women who were free of risk factors like obesity, hypertension, diabetes mellitus, chronic diseases and ischemic heart disease. According to the number of years attained menopause, they are sub grouped into Postmenopausal Women < 5 Years, (N=50) Group A & Postmenopausal women > 5 years(N=50) Group B. The reproductive age group women were taken as control without the above said risk factors (N=50) as Group C.

After getting informed consent from the study & control groups, the standing height and weight of the subjects were measured by using standard methodology [5] with the help of inch tape and weighing machine. BMI was calculated (BMI=Wt. in Kg / Ht. in m2).

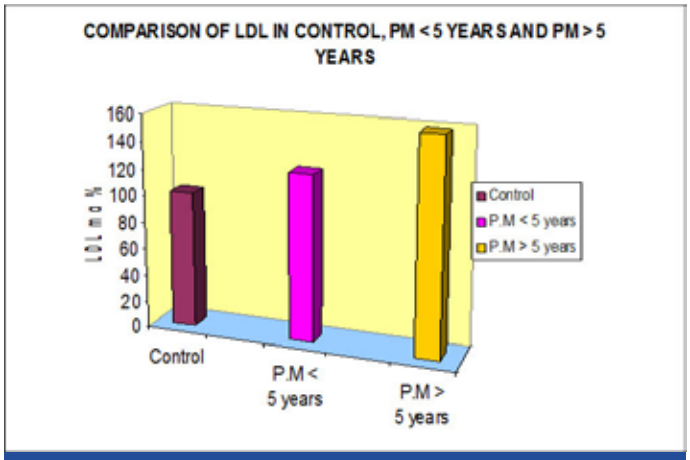
Waist / Hip ratio also was measured using Inch Tape for both control group as well as in study groups women. Circumference of waist was measured half way between the lower costal margin and the iliac crest. The circumference of hip was measured as the widest part of the gluteal region [6],[7].

Blood Lipid Profile &Echocardiography were assessed in Aarupa dai Veedu Medical College, Pondicherry.

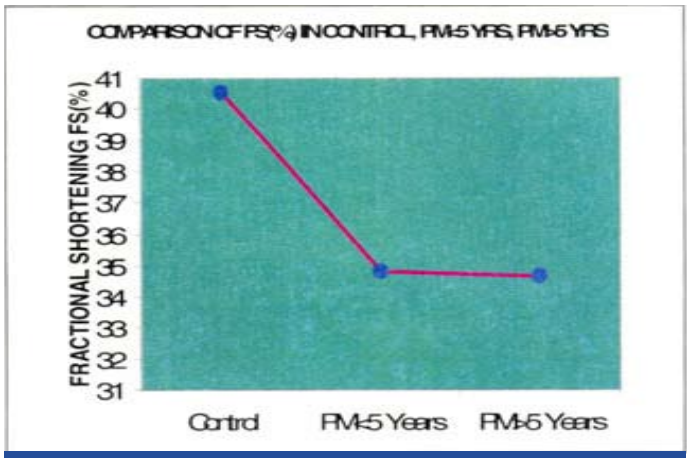
Parameter	Control	Postmenopausal <5 years	Postmenopausal >5 years
	x ± σ	x ± σ	x ± σ
W/H ratio	0.71 ± 0.03	0.74 ± 0.04	0.76 ± 0.04
TC (mg%)*	164.92 ± 28.13	203.48 ± 39.55	228.88 ± 37.85
HDL (mg%)	45.8 ± 2.96	45.48 ± 4.49	43.0 ± 2.97
LDL (mg%)*	101.8 ± 21.46	123.72 ± 31.31	158.76 ± 38.32
FS (mg%)*	40.51 ± 6.81	34.8 ± 9.75	34.68 ± 5.10
EF	67.64 ± 6.18	61.68 ± 6.18	62.24 ± 7.11
LV Mass	113.76 ± 32.92	126.36 ± 28.17	157.8 ± 73.49

* $P < 0.05$, **x**-mean, σ - Standard deviation, **TC:**Total cholesterol, **HDL:** High density lipids, **LDL:** Low density lipids.

[Table/Fig: 1] Comparison of lipid profile and lv function in control, postmenopausal<5 years, and postmenopausal>5 years group



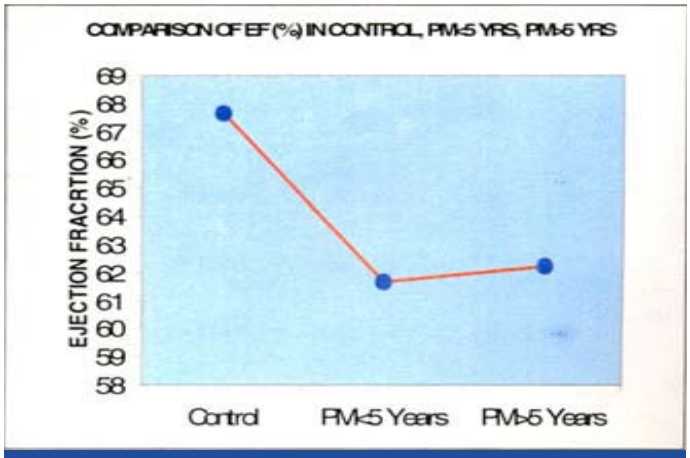
[Table/Fig 2]: LDL Cholesterol is significantly elevated in postmenopausal women>5 years.



[Table/Fig 3]: Comparison of FS% in control and both the study groups.

ESTIMATION OF BLOOD LIPID PROFILE

Blood Lipid profile including total cholesterol, triglyceride, LDL, HDL have been estimated in the Biochemistry laboratory by enzymatic colorimeter method for all the three groups. The sample of blood was taken for estimating lipid profile at 9 A.M after overnight fast. Precautions were taken to avoid sepsis while drawing the blood sample by using Dispovan syringe.



[Table/Fig 4]: Comparison EF in control and study group.

Results of lipid profile & contractility indices of left ventricle were analyzed by one way ANOVA test.

ECHOCARDIOGRAPHY

The indices left ventricular function like Fractional shortening (%), Ejection fraction (%) and LV mass of Postmenopausal women were assessed from the cardiology department by using M-Mode Echocardiography by cardiologist for both the groups.

RESULTS

BMI & W/H Ratio were elevated in both the sub groups of Postmenopausal Women <5 years & >5 years when compared with the control group. Among the lipid profile, Total cholesterol was elevated significantly ($P < 0.05$), but the raise in LDL cholesterol value was not significant in Postmenopausal women-<5 years. In Postmenopausal women > 5 years, the Total cholesterol value & LDL cholesterol value were found to be elevated than Postmenopausal < 5 years.HDL Cholesterol value is decreased in both the study subgroups which was not significant ($P > 0.05$). Echocardiographic findings revealed that there is a significant reduction of Fractional shortening in Postmenopausal >5years ($P < 0$. Fractional shortening (%) and Ejection fraction (%) were better in the control group than the Postmenopausal groups. LV mass did not vary significantly than control in both study groups [Table/Fig 1-4].

DISCUSSION

The Framingham study revealed that following menopause there is indeed an increased incidence of heart disease that is not just age related. Increased myocardial diseases after menopause may be due to raising LDL cholesterol levels that seem to be related to decreased Estrogen level in Postmenopausal period [8,9]. Orally administered estrogens influence hepatic lipid metabolism and raise high-density lipoprotein (HDL) cholesterol and triglycerides and lower low-density lipoprotein (LDL) cholesterol [10].

According to the present study, the mean values of waist circumference, hip circumference, Waist / Hip ratio were significantly increased in both subgroups of Postmenopausal women < 5 years and > 5 years than the control group [5]. Regarding the lipid profile status, the present study reveals that the total cholesterol value was significantly elevated in Postmenopausal women of both < 5 years and > 5 years duration [11] when controlled by control group. Both the total cholesterol & LDL cholesterol values were significantly elevated in Postmenopausal > 5 years women [10] than Postmenopausal <5 years. Though the HDL cholesterol level was reduced little in Postmenopausal age group, it is statistically significant (P value > 0.05). The HDL cholesterol level was significantly higher in control group [12]

The results showed that the fractional shortening (%) was reduced significantly in both subgroups of Postmenopausal women .The Ejection fraction (%) and Fractional shortening (%) values were better in the control group than Postmenopausal women [11]-[13]. However it was within the normal limit even in the Postmenopausal group too [14]. Similar studies done by Odysmik et al stated the effect of Hormone in postmenopausal women [15]-[16]. The total cholesterol level and LDL cholesterol level are significantly increased in the Postmenopausal group that too more significant in the sub group – Postmenopausal > 5 years due to estrogen deficiency [17]. Though the HDL cholesterol level, reduced little in Postmenopausal women than the control, it is found to be not significant [18],[19]. Regarding the Left Ventricular systolic function i.e., contractility indices like fractional shortening (%) and Ejection fraction (%) were better in the control group than the Postmenopausal groups. Fractional shortening was significantly reduced in Postmenopausal women of > 5 years of duration

For the betterment of Postmenopausal women routine Echocardiography is mandatory to assess the left ventricular function. To avoid such a predictable cardio vascular risk status, it is better to promote prophylactic Hormone Replacement Therapy to

all menopausal women [20]. The prime cause for the derangement of Lipid Profile Status in Postmenopausal women is the Hormonal changes that occurring in menopause especially **Estrogen deficiency** [21],[22], [23].

Review of the Literature done with similar articles published in the last decade.

S.no	Author's Name	Volume and page no.	Summary of Article
1)	Lareva, NV, Goreva	2008;(2):18-21	Explanation of fatty acids composition in postmenopausal women.
2)	Saran Yantama	2006,89 supplement 4; 537-541	Hormone therapy has been proven to have decreased lipid level in postmenopausal women and hence prevent CHD and CVD's
3)	Jam Col Cordial	2009, 15:54(25); 2366-2371	A marked increase in the lipid levels is seen in women both FMP and PMP irrespective of the ethnic creed.
4)	Creatsas G, Maturiatia	2005,1:52, 1:532-537	An increased level of lipids is more dangerous to cause CVD in postmenopausal women than in women of the younger age.
5)	Gorodeski G I	2002,June;(16): 329-355	An increased risk of CVD's is seen in women than in males with the same lipid levels.
6)	Park J S	2000 Nov15(11): 1835-1840	Hormone therapy helps to decrease LDL levels in the postmenopausal women.
7)	Woodard G A	2010;190-201	A marked decrease in the protective HDL is seen in postmenopausal women.

Literature review was done using "Google Scholar" and "Pubmed" with using keywords like "lipid profile, postmenopausal, CHD , CVD",study from 2000-2010.

CONCLUSION

The derangement in lipid profile status was observed markedly in Postmenopausal women of longer duration and the LV function significantly and negatively correlates with lipid profile status in those Postmenopausal women >5 years.

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