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RESEARCH ARTICLE

A STUDY OF INFLUENCE OF MENOPAUSE ON SERUM LIPID PROFILE

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Abstract

Background: Menopause is a physiological change due to which women passes from fertile to infertile period. Decreased oestrogen production in post menopausal women alter the lipid metabolism. Since altered serum lipid profile seen in menopause is one of the significant risk factors for developing coronary heart diseases, influence of menopause on lipid levels is aimed to study.

Aim and Objective: To study the influence of menopause on serum lipid profile by estimating the level of serum cholesterol and various lipoproteins in premenopausal and post menopausal women.

Methods: After getting ethical committee approval, in this cross sectional study, women of age 45- 55 and normal BMI attending Government Sivagangai Medical College for master health checkup were selected. Informed consent obtained and estimation of serum lipid profile was done for all of them.

Results: Statistical analysis was done by **student's t test** and the results were compared between pre and post menopausal women. In post menopausal women, the mean values of triglycerides ($p=0.016$) and very low density lipoprotein levels ($p=0.046$) were increased significantly.

Conclusion: Significant increase in serum triglycerides and very low density lipoproteins is due to menopause which causes changes in body metabolism. Serum lipid levels should be checked periodically after menopause and life style modifications should be advised at an earlier stage.

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Introduction:-

Today women live for about one third of her life after menopause. The loss of reproductive function after menopause have an impact on their mental and physical health. Loss of stocks of oocytes results in grossly reduced production of oestrogen. Alteration in lipid levels can be correlated with serum oestradiol.

According to **Nurses' Health Study**, women who have not provided with oestrogen replacement therapy after menopause are having more chance of developing coronary heart diseases. So the periodical screening of postmenopausal women for serum lipid profile and to study the influence of menopause on lipid levels helps to protect the women from atherogenesis.

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Aim:-

To study the influence of menopause on serum lipid profile by estimating the level of serum cholesterol and various lipoproteins in premenopausal and post menopausal women.

Study Design –

Cross sectional study.

Study Group

Age and body mass index matched 50 healthy women are divided into two groups. GROUP I consists of 25 premenopausal women and GROUP II consists of 25 postmenopausal women.

Inclusion Criteria

1. Age between 45 - 55 years
2. Normal BMI 18.5 -24.9
3. Not on hormone replacement therapy

Exclusion Criteria

1. Heart diseases
2. Systemic diseases - Hypertension, Diabetes mellitus
3. Liver disorders
4. Drug intake - Rifampicin, Phenytoin, Statins etc
5. Endocrine dysfunction
6. Smoking

Materials and Methodology:-

After getting approval from the ethical committee, healthy women of age 45 to 55 years and BMI 18.5 -24.9 attending Government Sivagangai Medical College Hospital for master health checkup were selected. Informed and written consent were obtained from them. Detailed medical history, general and systemic examination were carried out. Routine biochemical investigations were done. 50 eligible candidates for the study were selected and were divided into two groups with 25 premenopausal women in GROUP I and 25 post menopausal women in GROUP II. After 10-12 hours of fasting, under sterile precautions 3ml of venous blood sample was collected, quantitative determination of serum lipid profile by **enzymatic method** was done.

Results and Analysis:-

Statistical analysis was done by **student's t test** and the results were compared between pre and post menopausal women. By means of **SPSS software version 16**, results analysis was performed. The statistical significance was drawn at '**p**'- value of **< 0.05**.

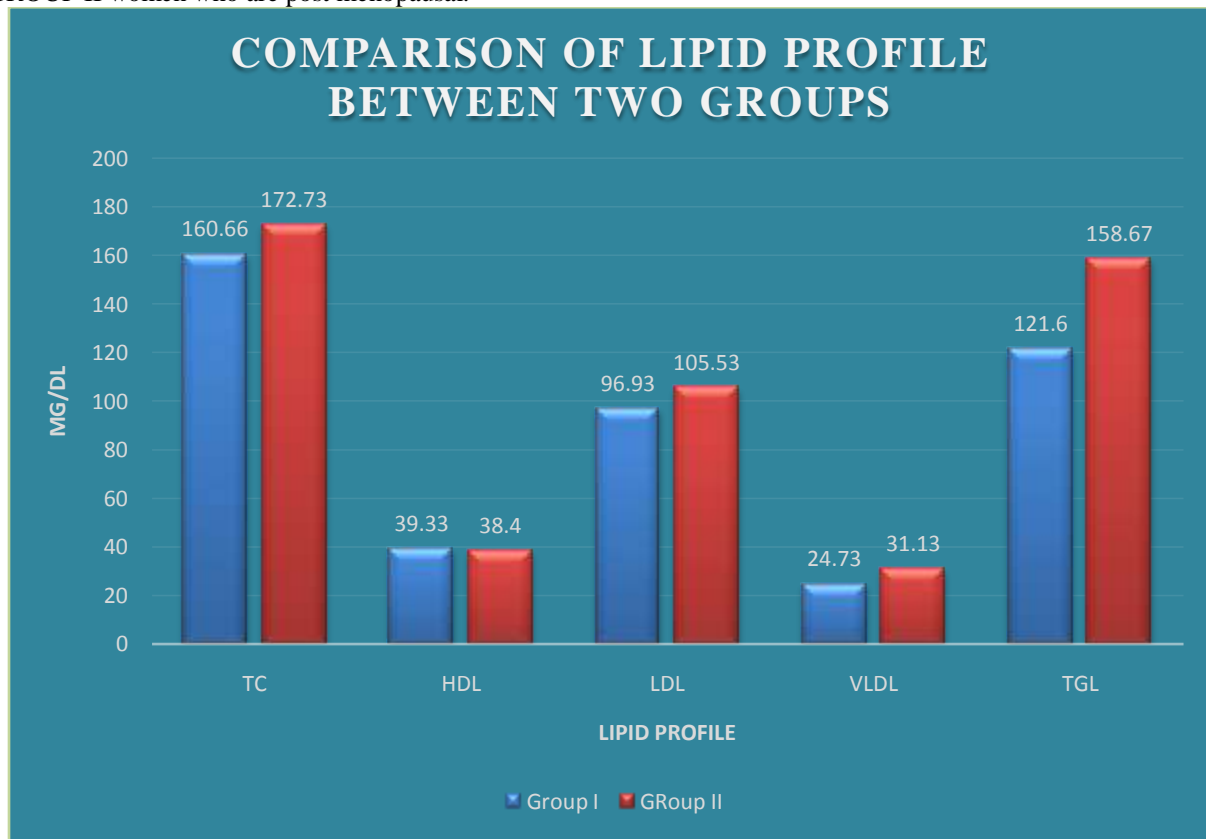
In post menopausal women, the mean values of triglycerides ($p=0.016$) and very low density lipoprotein levels ($p=0.046$) were increased significantly when compared with the mean values of lipid profile in premenopausal women.

Mean Values Of Lipid Profile

Parameters	Group I (N=25) PREMENOPAUSAL WOMEN		Group II (N=25) POST MENOPAUSAL WOMEN		'p' value
	Mean	SD	Mean	SD	
Total cholesterol (mg/dl)	160.66	24.289	172.73	22.010	0.219
High density lipoprotein (mg/dl)	39.33	7.860	38.40	4.606	0.445

Low density lipoprotein (mg/dl)	96.93	22.437	105.53	23.430	0.355
Very low density lipoprotein (mg/dl)	24.73	5.421	31.13	6.635	0.046 (significant)
Triglycerides (mg/dl)	121.6	28.084	158.67	32.083	0.016 (significant)

While comparing the mean values of lipid profile between the two groups, total cholesterol and low density lipoprotein levels are increased in GROUP II but it is insignificant. Level of very low density lipoprotein and triglycerides are increased in GROUP II significantly. There is also a decrease in high density lipoprotein level in GROUP II women who are post menopausal.



Mechanism

Changes in serum lipid profile is associated after menopause and these changes are primarily due to deficiency of serum oestradiol. Cholesterol is a steroid substance present in every cell and helps in the synthesis of bile acids and steroid hormones. The function of lipoproteins is to transport cholesterol and triglycerides in blood to all tissues.

Oestrogen prevents atherosclerosis by its vasculoprotective action. It prevents oxidation of low density lipoproteins by antioxidant effect. Oestrogen reduces hepatic lipase which catabolizes the high density lipoproteins thus increases the level of high density lipoproteins. Oestrogen increases the hepatic expression of low density lipoprotein receptors thereby low density lipoproteins clearance is enhanced and low density lipoproteins level is reduced.

Discussion:-

In general, normal range of lipids are needed to maintain a healthy cardiac function. According to the guidelines of the **National Cholesterol Education Programme Adult Treatment Panel III**, lipids level need to be evaluated to manage the cardio vascular diseases. Serum lipid profile vary in every individuals and they depend on body mass index, exercise, smoking, diet, systemic diseases like hypertension, diabetes mellitus, liver and metabolic diseases. So we excluded these confounding variables and age matched, body mass index matched women were selected in our study.

In our present study, we have divided the study group into GROUP I with premenopausal women and GROUP II with post menopausal women. In post menopausal women, the mean values of triglycerides ($p=0.016$) and very low density lipoprotein levels ($p=0.046$) were increased significantly. The elevated level of very low density lipoprotein level and triglycerides increases the risk of developing cardiovascular diseases after menopause.

Conclusion:-

Periodical screening of serum lipid profile is essential in postmenopausal women by which secondary prevention of cardiovascular diseases is possible. **Life style modifications** like dietary change, regular exercise may be advised. Hormone replacement therapy and lipid lowering medications can be suggested if necessary.

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