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A cohurt study on association and inflammatiory markers of cardio metabolic risk factors in pre and post menopausal women

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ABSTRACT

Pre and post menopause were the complications faced by women globally that not only interferes in physical health but also in mental health of a woman. The menopause factors includes many traditional CVD risk factors, including changes in body fat distribution from agynoid to an android pattern, reduced glucose tolerance, abnormal plasma lipids, increased blood pressure, increased sympathetic tone, endothelial dysfunction and vascular inflammation . Menopause is a risk factor for (CVD) because estrogen withdrawal has a detrimental effect on cardiovascular function and metabolism .The present study aimed for inflammatory markers of cardio metabolic risk factors in post menopausal women and premenopausal women and the results recorded the significant level of elevation in all parameters compared with case and control samples and the significance was given as student's t test($p<0.001$).

1. Introduction

The life of human being is usually divided into several stages in which exist certain characteristic changes may happen depends on the environment. Each stage of life is influenced by specific aspect as infancy, childhood, adolescent, adult, middle age and old age. Infancy, puberty (adolescence), sexual maturation (reproduction), climacteric and post climacteric are the various stages in a typical woman and especially adolescence represent the age of a student from school to college. From the late teens to pre-menopause in the late 40s is a period of sexual maturation, also called the reproductive age, the 5 years before and after menopause is defined as the climacteric period, and a woman is said to have reached menopause when no menstruation occurs for 12 consecutive months and this usually occurs in the mid-40s to mid-50s.[1]

The average life expectancy of women has increased rapidly and consequently, incidence of medical diseases specific to postmenopausal women have increased.[2] Decreased estrogen secretion from the ovaries induces vasomotor symptoms including hot flushes (flashes), abnormal sweating, and vertigo. With estrogen deficiency, osteoporosis due to increased bone resorption, hypercholesterolemia due to decreased LDL receptors, and atherosclerosis progress.[3]

These diseases are also associated with lifestyle habits and call for active intervention.[4] So that the present study is aimed for screening of inflammatory markers of cardio metabolic risk factors among post menopausal women and premenopausal women and its complication in study area.

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2. Materials and Methods

2.1. Study design

The present pilot study was conducted for a duration of 2 weeks where 50 populations of post menopausal and pre menopausal women were investigated. The family history collected from all participates by oral or questionnaire method. A total of 5mL venous blood was collected in menopausal patients (n=50). 5mL of serum sample was used for biochemical analyses of lipid profile was estimated by (CHOD-PAP method) and CRP (slide method), (Hb Sahli's acid haematin method), (ESR Westergren method). Exclusion criteria was denoted namely cardiovascular disease, known case of menopause patients

2.2. Statistical analysis

Data was recorded on a predesigned proforma and managed on an Excel spreadsheet. Frequency and percentage of each parameter was calculated and analyzed. The risk estimates were analyzed between the cases and controls expressed in the form of Mean ± SD with p values. The student t testwas used to assess the statistical differences between cases and control and p value of <0.001was considered significant.

3. Results and Discussion

Peri-menopause/menopause transition is the period immediately prior to menopause and up to 1 year after the final menstrual period. It may last for 3–5 years. The menopausal transition is characterized by menstrual cycle variability and fluctuations in reproductive hormone levels.[5] The individual response to menopause varies considerably due to genetic, cultural, lifestyle, socioeconomic, education, behavioral and dietary factors. Postmenopausal symptoms give rise to social consequences which ultimately affect their quality of life (QOL). The poor QOL among high proportionate of menopausal phase of women would place a significant burden on public health care in developing countries like India.[6]

Enlightening the fact and to assess the association between post menopausal women and healthy women the present investigation study was planned to record the association, inflammation markers, cardio metabolic risk factors in post menopausal women and the study was conducted with a sample size of 50 including case(n=25) and control(n=25) were screened for a period of 2 weeks. Data on demographic profile of the study population were presented in (Table 1 & Figure 1)

In the present study 76% (n=19) of cases, 24% (n=6) of controls expressed abnormal in ESR that may lead to anemic complications. The acute phase reactants like Erythrocyte sedimentation rate(ESR) and C-reactive Protein (CRP) were the commonly used parameters for detection of disease in rheumatology clinics, they accompany both acute and chronic inflammatory reactions[7]

Table 1: Mean values for age, ESR, Hb, CRP & Lipid profile

Markers	Case (n=25)	Control(n=25)	P values
Age (years)	56.68± 8.08	20.12± 3.1	0.0001
ESR (mm/hr)	43.36± 25.98	24.72± 19.24	0.05
Hb (gm/dL)	11.13± 2.08	10.41± 2.19	0.24
CRP	0.28± 0.45	0	0.004
TCHO (mg/dL)	258.7± 75.41	244.5± 73.69	0.5
TGL (mg/dL)	137± 55.54	109.7± 29.07	0.03
HDL (mg/dL)	68.08± 45.11	48.95± 15.07	0.05
LDL(mg/dL)	169.08± 75.29	174.8± 58.66	0.76
VLDL(mg/dL)	30.04± 14.55	21.4± 4.71	0.07

Table shows the Mean±SD
Menopausal women(Control) were compared with non menopausal women(Case)
T-Test was used for comparison

Abnormalities in Hb were found in 60% (n=15) of cases and 68% (n=17) of controls. Hemoglobin abnormality may lead to haemodilution, anaemic complications. Low hemoglobin level is associated with increased cardiovascular mortality and chronic kidney disease (CKD) in patients with diabetes mellitus[8]

28% (n=7) of cases were observed with significant level of changes in CRP and no changes were observed in controls. High elevation in CRP may cause heart related complications. During the state of infection or inflammatory condition, the levels of CRP rise rapidly in first 6 to 8 hours and reach at its peak of upto 350–400 mg/L after 48 hours.[9]

Increased amount in Total cholesterol (P<0.5) were detected in both non menopausal (258.7± 75.41) and menopausal women(244.5±73.69). Increase in total cholesterol level may result in peripheral arterial disease, Stroke and other heart related problems. High cholesterol in serum is a leading risk factor for human cardiovascular disease such as coronary heart disease and stroke-wrold's number one killer.[10]

Elevated levels of triglycerides were noticed in 36% (n=9) of cases and 12% (n=2) of controls. Elevation in TGL may cause stroke and kidney related problem, obesity and hyperlipidemia. Increased levels of triglycerides were commonly found in many people suffering from heart disease or diabetes. Because triglycerides were also linked with heart disease, it was also the most common fat that deposit in the body. Combination of triglycerides with HDL cholesterol or high LDL cholesterol would increase atherosclerosis which settle as fatty deposit in walls of artery that may further increase the risk factor of heart attack and

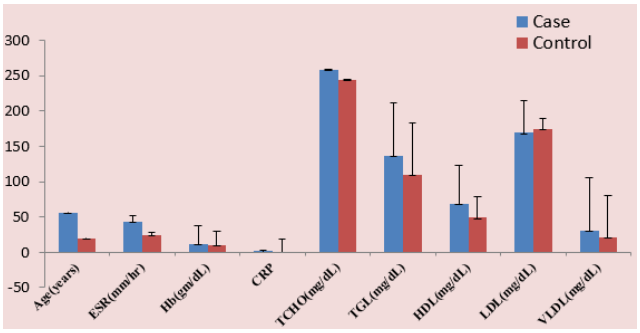

Fig. 1: Biochemical markers of cases and controls

stroke [11]

HDLs were found to be raised in 24% (n=6) of cases and 8% (n=2) of controls. Increase in HDL level may either cause heart related issues or genetic mutation. The liver synthesis high density lipoproteins which further carries cholesterol and other lipids from tissues back to the liver for degradation. [12]

92% (n=23) of cases and 76% (n=19) of control were noticed with significant level of increase in LDL, Increased level of LDL may result in depression, stroke etc. Low density lipoproteins or bad cholesterol were the lipoproteins through blood stream transports cholesterol from liver and intestine to cells and tissues throughout the body [13]

VLDL were found higher in both 20% (n=6) of cases and 40% (n=1) of controls respectively and the higher level of VLDL may cause heart related problems to the persons having high density of VLDL.

VLDL is a type of lipoprotein with the highest amount of triglycerides and it is categorized as a type of bad cholesterol because it eventually gets converted into LDL and causes buildup of cholesterol on the walls of arteries. [14]

Based on overall account of the present investigation the complications were found common for both control and cases. Maintaining proper diet, physical activity, undergoing a proper treatment, leading a hygienic cum harmonic life may minimize these kinds of complications in future. This kind of comparative screening study is need of the hour to assess the risk factors in post menopausal women periodically for improving better health.

4. Limitations

Our study has limitations inherent to its retrospective design. Since this was a case control study evaluating the clinical markers of Pre and Post menopausal and its associated risk factors and the results do not taken into account some variables, such as the exposure time may induce the factors of the disease. Our study group were chosen based on BMI, food and life style which, was the most widely used anthropometric variable to distinguish the factors for pre and post menopausal conditions.

5. Conclusion

A regular menstrual cycle is an important indicator of a healthy reproductive system. A sudden changes in the normal menstrual cycle results in both physical and mental complications. Based on the present comparative study all the biomarkers clearly indicate the abnormal level of various clinical parameters in pre and post menopausal populations.

All the clinical parameters like ESR, Hb, CRP, Lipid profile were found abnormal and may result in complications like Heart complication, Stroke, Obesity, Kidney disease and genetic mutation etc. The testosterone concentration would be higher in those post menopausal women after the menopause. Loss of ovarian function at the menopause and the resulting hypo-estrogenic state are believed to increase the risk of cardiovascular disease and higher risk of autoimmune disorder.

By maintaining proper diet along with Physical activity, undergoing a proper treatment during the initial stage may reduce the complications at some extent and ensure to lead a normal healthy life.

6. Source of Funding

None.

7. Conflict of Interest

None.

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