



## EFFECT OF POSTMENOPAUSAL STATUS ON SERUM LIPIDS PROFILE AND URIC ACID IN SUDANESE FEMALES FROM THE GENERAL POPULATION

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### ABSTRACT

**BACKGROUND:** Previous data suggest possible effects of postmenopause on serum lipids profile and uric acid which are established risk factors for cardiovascular system.

**AIM:** to evaluate the changes that may occur on serum lipids profile and uric acid measurements in postmenopausal Sudanese women.

**MATERIALS AND METHODS** The study involved 150 females. The studies subjects were grouped according to their menstrual status to women at age of menarche (75 women) their age ranged between (45 – 90 years, mean of 59.1), and women at age after menopause (75 women) aged between (25 – 49 years, mean 35.9). Following at least 12 hours fasting, serum total cholesterol (TC), high density lipoprotein (HDL), low density lipoprotein (LDL), and uric acid were measured.

**RESULTS:** lipids measurements were significantly different in both groups; HDL-cholesterol was significantly less in postmenopausal women ( $M \pm SD = 45.2 \pm 13.76$  mg/dl) compared to women at age of menarche ( $M \pm SD = 51.8 \pm 14.9$  mg/dl,  $P = 0.032$ ). TC, LDL, and UA concentrations are significantly increased in postmenopausal women ( $171 \pm 19.6$  mg/dl,  $120.5 \pm 19$  mg/dl and  $5.0 \pm 0.8$  mg/dl) compared with women at age of menarche ( $149.2 \pm 25.7$  mg/dl and  $94.7 \pm 10.1$  mg/dl, and  $3.66 \pm 0.7$ ,  $P = 0.000$ ,  $0.002$ , and  $0.001$  respectively).

**CONCLUSION:** two possible cardiovascular risk factors may present in postmenopausal women hyperlipidaemia and increased uric acid, so screening is necessary to women at this age.

### INTRODUCTION:

Women in different stages are exposed to different hormonal environments, which may assert different effects on metabolic pathways (1).

Many large epidemiological studies confirmed a positive association between raised serum uric acid (UA) levels and risk of coronary heart disease (CHD) or cardiovascular disease (CVD) in the general population (2). Estrogen has a uricosuric effect, making gout very rare in younger women. However, after the menopause, urate levels rise and gout becomes increasingly prevalent (3). women compared to men uric acid levels are lower in younger ages, but the difference becomes smaller with older ages, and especially after menopause this gender difference is lost, the main factor for this is presumed to be a female hormone influence(4).

Dyslipidemia is a major cause of cardiovascular disease, which in turn, is the most common cause of female morbidity and mortality (5).

Postmenopausal women are at higher risk of developing cardiovascular disease, especially coronary artery atherosclerosis (6). This may be due to changes in the

plasma lipid-lipoprotein levels that occur following menopausal transition. Elevated total cholesterol, LDL-cholesterol and triglycerides are more common in post-menopausal women (7).

There are very few studies on the effects of menopause on serum lipoproteins and uric acid concentrations among Sudanese women.

### MATERIALS AND METHODS:

#### STUDY POPULATION:

Subjects of 150 women were included in this study aged from 25 to 90 years, 75 were at age of menarche and other 75 were postmenopausal women, women who had history of contraceptive use or those who under hormone replacement therapy were excluded from this study. Women who were diagnosed with hypertension, diabetes mellitus or chronic renal disease were also excluded from the study.

The study was approved by university ethics committee and all subjects gave informed consent (Based on Helsinki Declaration).

A detailed age, history of menopause, use of hormone replacement therapy (HRT) and/or contraceptive medication were recorded for each participant. compare between groups, P.value<0.05 was considered significant.

**BLOOD SPECIMEN COLLECTION AND LABORATORY DATA:**

Blood specimens were obtained by venipuncture after fasting for 12 hours. Biochemical parameters (uric acid, total cholesterol, HDL-cholesterol, and LDL-cholesterol) were analyzed using enzymatic method with commercially available kits (spinreacts, and Biosystems, Barcelona, Spain).

**STATISTICAL ANALYSIS:**

Statistical analysis was carried out using the SPSS (statistical package for social science), all descriptive data were expressed as mean±SD. Student T-test was used to

**RESULTS:**

The age of the postmenopausal women (M±SD = 59.1±9.4 years) and of women at age of menarche (M±SD = 35.9±7.3 years, P = 0.000). The concentrations of TC and LDL were significantly higher in postmenopausal women (M±SD = 171±19.6 mg/dl, 120.5±19 mg/dl) compared to women at age of menarche (M±SD = 149.2±25.7 mg/dl and 94.7±10.1 mg/dl, P = 0.000 and 0.002 respectively). In addition, serum HDL concentrations were lower (M±SD = 40.5±5.0 mg/dl) while uric acid levels were higher (M±SD = 5.0±0.8 mg/dl) in postmenopausal compared to women at age of menarche (M±SD = 44.4±8.0 mg/dl and 3.66±0.7 mg/dl, P = 0.000 and 0.001 respectively).

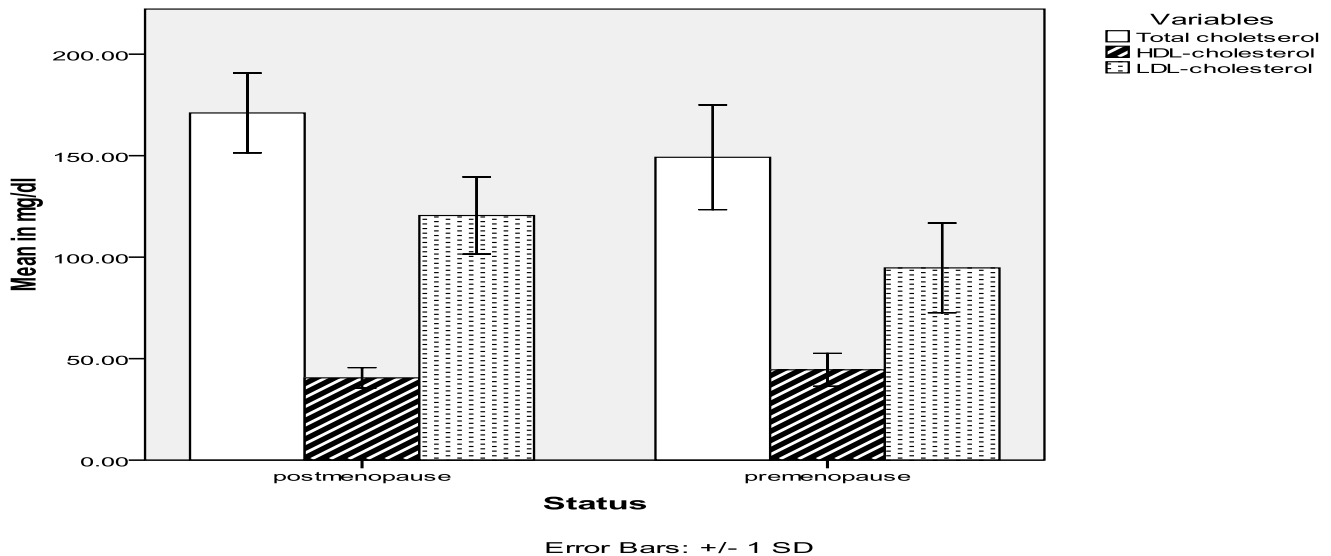


Figure 1: Lipids profile concentrations in the studied groups

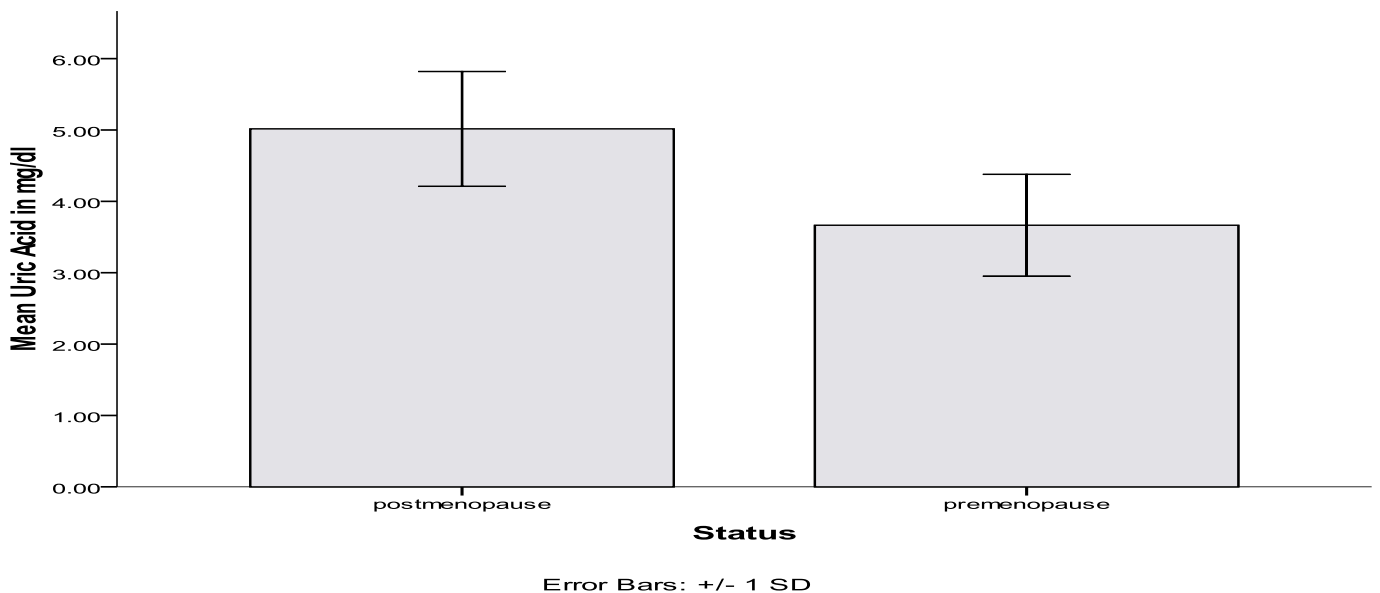


Figure 2: Serum uric acid concentrations in the studied groups

**DISCUSSION:**

Previously they reported that altered lipid profile may help to explain why postmenopausal women appear to be more susceptible to atherosclerotic cardiovascular events regardless of the effect of age (8;9).

We found that postmenopausal women had significantly higher concentrations of total cholesterol compared to women with age at menarche, this association with found to be compatible with other studies (4;10).

Physiologically low estrogen levels associated with menopause was proved to minimize LDL clearance by the liver and hence increase LDL-cholesterol in postmenopausal women (11).

In the current study, the means of both TC and LDL were higher in postmenopausal women, and the difference is statistical significance; alternatively, HDL-cholesterol was significantly higher in women at age of menarche compared to postmenopausal. The low levels of HDL-cholesterol in elderly females with postmenopausal puts them at higher risk of coronary heart disease. These findings was in accordance with Eapen DJ et al,. findings (12).

Previous studies in the kinetics of LDL suggest that LDL increase with age in both sexes, but this increase is highly remarked in female (13). On average, young women have lower levels of blood cholesterol than young men. However, after menopause, LDL levels rise for most women. The average age at which menopause occurs in most women is 51, although it may begin as early as age 40, according to the Harvard School of Public Health. LDL levels begin to rise at this time, while HDL or good cholesterol usually decreases.

Elevated circulating serum uric acid concentrations may be linked with an increased risk of coronary heart disease (CHD) (14). The recent study revealed that uric acid concentration was significantly higher in postmenopausal versus women at age of menarche. This elevation of serum uric acid was explained by the uricosuric effect of estrogen which is lack at this age (15). Earlier menopause was shown to be a risk factor for gout while hormone replacement therapy seems to modestly reduce the risk of gout. Other researchers have examined the menopausal status or menopausal transition and its effect on uric acid levels and confirm our findings (16).

**CONCLUSION:**

Results of the present study suggest the importance of continued lipid screening throughout menopause, although absolute lipid changes were modest, the continuous relation between lipoproteins and cardiovascular risk has been established. Compared with

women at age of menarche, postmenopausal women had a 2-fold risk of low density lipoprotein cholesterol above the level recommended by national guidelines.

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