



## RENAL AND LIVER PROFILE IN PRE AND POST MENOPAUSE WOMEN ATTENDING OPD OF A TERTIARY HEALTH CARE LEVEL INSTITUTE OF HARYANA, INDIA.

**Dr. R. Tiwari**

Senior Resident, Department of Medical Biochemistry Safdarjung Hospital & VMMC, New Delhi, INDIA

**Indra Prasad Adhikari\***

Msc Medical Biochemistry, F-1/3, New Doctors Colony, Rewa, M.P. \*Corresponding Author-

### ABSTRACT

**BACKGROUND:** Menopause is a natural step in the process of ageing in a woman's life, when her menstruation stops and she is no longer fertile due to depletion of ovarian follicles. Onset of menopause alters the liver functions the most common tests include testing for ALT, AST, Bilirubin and Albumin. Similarly renal function status also alters in terms of urea, creatinine and calcium. Chronic kidney disease (CKD) in women is often accompanied by menstrual and fertility disorders as a consequence of kidney-mediated endocrine disturbances.

**METHODOLOGY:** 50 healthy premenopausal & 50 healthy postmenopausal women were included in study, 5 ml. of venous blood was taken in red vacutainer and serum was separated. Liver profile and renal profile was estimated by enzymatic method in auto analyser.

**RESULTS:** in the present study the mean values of kidney profile in premenopausal group was found as (in mg/dl) urea ( $22.22 \pm 5.07$ ), creatinine ( $0.69 \pm 0.13$ ) calcium ( $9.73 \pm 0.60$ ), phosphorus ( $3.06 \pm 0.42$ ) and in postmenopausal group was found as urea ( $25.94 \pm 4.386$ ), creatinine ( $0.740 \pm 0.136$ ), calcium ( $9.89 \pm 0.598$ ), phosphorus ( $3.20 \pm 0.49$ ). The p values for this were found as for urea ( $p < 0.05$ ), for creatinine ( $p = 0.115$ ), calcium ( $p = 0.185$ ) & for phosphorus ( $p = 0.145$ ). In present study liver parameters in premenopausal group of women found as (U/L, mean  $\pm$  SD) of SGOT was ( $24.40 \pm 4.58$ ) and for SGPT it was found ( $27.06 \pm 6.61$ ) & for ALP was found ( $74.56 \pm 20.80$ ) and in postmenopausal group these values were found as ( $28.78 \pm 5.39$ ), ( $31.14 \pm 4.42$ ) & ( $86.16 \pm 18.17$ ) respectively.

**CONCLUSION:** This study suggests that there is increase in liver and kidney profile parameters in postmenopausal women as compared to premenopausal women i.e. postmenopausal women have more risk of liver and kidney damage hence a timely health check up must be intensified specially among postmenopausal women.

**KEYWORDS :** ALT, AST, pre and post Menopausal women.

### INTRODUCTION

Menopause" term is derived from the Greek word 'men' means 'month' and 'pau' means 'to stop' that is cessation of menstrual period. Menopause is a natural step in the process of ageing in a woman's life, when her menstruation stops and she is no longer fertile due to depletion of ovarian follicles and gradual decrease in ovarian production of estrogen and other hormones<sup>1</sup>. Every woman undergoes menopause, which is an unavoidable physiological age dependent phenomenon, though age of entering in this phase of life and symptoms are different for every women. It has been observed that there is increased production of free radicals after menopause which is due to sudden alterations in hormonal status<sup>2</sup>. Onset of menopause alters the liver functions the most common tests include testing for alanine aminotransferase (ALT), aspartate aminotransferase (AST), bilirubin and albumin. A total serum protein test measures the total amount of protein including albumin and globulin in the blood. Serum levels of alanine aminotransferase (ALT), aspartate aminotransferase (AST), gamma-glutamyltransferase, lipid parameters, glucose, and endocrinological hormones were measured. Both levels of AST and ALT increased towards early post-menopause. AST remained high in late post-menopause but ALT decreased. The AST/ALT ratio decreased towards late menopausal transition and very early post-menopause and increased thereafter. This ratio was negatively correlated with triglyceride. Significant changes in ALT and AST/ALT ratio during the menopausal transition, which were associated with triglyceride, might be involved in the occurrence of metabolic syndrome and NAFLD. Chronic kidney disease (CKD) in women is often accompanied by menstrual and fertility disorders as a consequence of kidney-mediated endocrine disturbances. Although nephrologists are often viewed as primary care providers for their patients<sup>3</sup>. Chronic kidney disease (CKD) has been reported to affect 15% of all women in the United States<sup>4</sup> but relatively little is known about the relation between CKD and menopause. Women with end-stage renal disease have characteristics of accelerated aging, with premature menopause, bone fractures, and cardiovascular events<sup>5,6</sup>. Women with earlier stages of CKD experience premature cardiovascular morbidity and may also

experience an excess burden of fractures,<sup>7,8</sup> yet studies of menopausal characteristics across the spectrum of kidney function are lacking.

### MATERIALS AND METHODS

This was a cross sectional study conducted in the Department of Biochemistry in collaboration with Department of Obstetrics and Gynaecology, PT. B.D. Sharma, PGIMS, Rohtak. In the present study, total hundred female subjects including fifty healthy premenopausal women as controls and fifty healthy postmenopausal women as cases were enrolled for the study. Effort was made to match the controls with cases with respect to socioeconomic and nutritional status. Inclusion criteria for cases and controls: 1. Healthy premenopausal (twenty five to forty years) women without any menstrual irregularities. 2. Healthy postmenopausal women with history of natural menopause (three to five years of menopause). Exclusion Criterion for cases and controls: 1. History of cardiovascular diseases. 2. History of rheumatoid arthritis. 3. History of radiotherapy. 4. History of liver and renal disease. 5. History of endocrinal disease. 6. Women on antioxidant, and vitamin supplements. 7. Women on Hormone Replacement Therapy

**SAMPLE COLLECTION:** Five ml of venous blood was drawn under aseptic precautions from antecubital vein in appropriate blood collection tubes. Samples were collected after overnight fast of 10-12 hours. Samples were processed within one hour of collection. Serum was separated by centrifugation at 2000 rpm X 10 minutes after clotting. Separated serum was stored at -20°C if not analysed immediately.

**DATA ANALYSIS:-** It was done by using SPSS 21.

### RESULTS

All the subjects were subjected to detailed history taking as per proforma. Test parameters were tabulated as per the master chart. The results were expressed in terms of mean  $\pm$  SD. The p value  $< 0.05$  was considered as significant. In the present study most of the

premenopausal women i.e. 60 % were belong to age group( **Table no 1.**) 25 to 29 years, 34% were belong to age group 30- 34 years and 6% were in age group of 35 to 39 years. Most of the postmenopausal women were in the age group of more than 50 years i.e. 86 % and only 14 % were in the age group 46 to 50 years. The mean and SD (mg/dl) of urea, creatinine, calcium, phosphorus in the premenopausal group was found  $22.22 \pm 5.07$ ,  $0.69 \pm 0.13$ ,  $9.73 \pm 0.60$ ,  $3.06 \pm 0.42$ . respectively. In postmenopausal group the mean and SD (mg/dl) of urea, creatinine, calcium, phosphorus was found  $25.94 \pm 4.386$ ,  $0.740 \pm 0.136$ ,  $9.89 \pm 0.598$ ,  $3.20 \pm 0.49$  respectively. (**Table no 2.**) .In premenopausal group of women mean  $\pm$  SD of SGOT was  $24.40 \pm 4.58$  (U/L) and SGPT it was found  $27.06 \pm 6.61$ (U/L) and mean  $\pm$  SD for ALP was found  $74.56 \pm 20.80$  (U/L) and in postmenopausal women it was found  $28.78 \pm 5.39$ (U/L),  $31.14 \pm 4.42$  (U/L),  $86.16 \pm 18.17$  respectively. (**Table No 3**)

**Table No.1 Age wise distribution of study subjects**

Age group (years)	Premenopausal	Postmenopausal
25-29	30(60%)	-
30-34	17(34%)	-
35-39	3(6%)	-
40-44	-	-
45-49	-	7(14%)
>50	-	43 (86%)
<b>Total</b>	<b>50(100%)</b>	<b>50(100%)</b>

**Table No. 2 Renal profile of participants**

Parameter		Premenopausal	Postmenopausal	p value
Urea (mg/dl)	Mean $\pm$ SD	$22.22 \pm 5.07$	$25.94 \pm 4.386$	< 0.05
	Range	14- 34	16- 36	
Creatinine (mg/dl)	Mean $\pm$ SD	$0.69 \pm 0.13$	$0.74 \pm 0.13$	0.115
	Range	0.5 -1	0.5 -1	
Calcium (mg/dl)	Mean $\pm$ SD	$9.73 \pm 0.60$	$9.89 \pm 0.59$	0.185
	Range	8.9-11	8.9-11.2	
Phosphorus (mg/dl)	Mean $\pm$ SD	$3.06 \pm 0.427$	$3.20 \pm 0.49$	0.145
	Range	2.2-4	2.2-4	

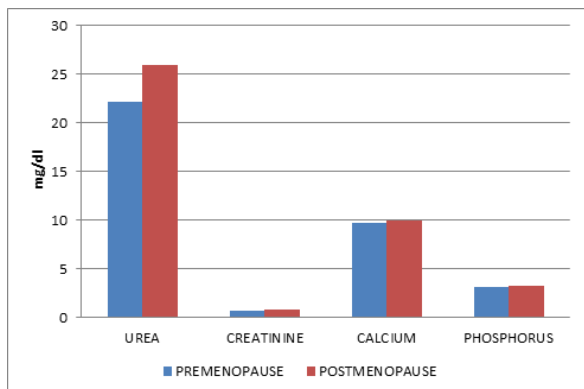


Image1- Urea, Creatinine, Calcium, Phosphorus in pre and postmenopausal women

**Table No. 3 Liver profile of participants**

Parameter		Premenopausal	Postmenopausal	p value
SGOT (U/L)	Mean $\pm$ SD	$24.40 \pm 4.58$	$28.78 \pm 5.39$	< 0.05
	range	17 – 33	20 – 38	
SGPT (U/L)	Mean $\pm$ SD	$27.06 \pm 6.61$	$31.14 \pm 4.42$	<0.05
	range	14 – 40	22 – 39	
ALP (U/L)	Mean $\pm$ SD	$74.56 \pm 20.80$	$86.16 \pm 18.17$	0.004
	range	42 – 110	49 – 112	

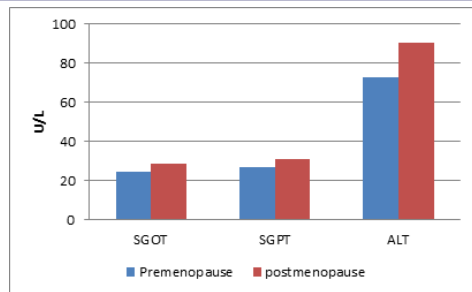


Image2- Distribution of SGOT, SGPT and ALP in pre and postmenopausal women

**DISCUSSION**

In the present study in premenopausal group, 60 % women were belonged to 25-29 years of age, 34% women were in the age group of 30 to 34 years and 6% women were in the age group of 35 to 39 years and the mean age was  $29.30 \pm 3.41$  years. In postmenopausal group, 60% women were in the age group 50 -54 years and 20 % women were in the age group of 55 to 59 years and the mean age was  $54.04 \pm 2.40$  years. The age group distribution of our study was found to be comparable with the similar studies conducted by Shrivastava et al.9, Deepthi et al 10 and Chinayere et al11. In the present study renal profile was found more deranged in postmenopausal women than premenopausal women as creatinine and Urea in present study it was found increased in postmenopausal women than premenopausal group as mean  $\pm$  SD for serum creatinine was found  $0.74 \pm 0.13$  mg/dl in postmenopausal and  $0.69 \pm 0.13$  mg/dl in premenopausal women with p value 0.115 which was although found statistically not significant. We also found increased urea level in postmenopausal women in comparison to premenopausal women with mean  $\pm$  SD value for urea level was  $25.94 \pm 4.38$  mg/dl and  $22.22 \pm 5.07$  mg/dl in postmenopausal and premenopausal women respectively this was comparable with the study conducted by Sanchez et al12 this increase in urea may be due to relative dehydration in postmenopausal women than premenopausal women due to estrogen deficiency, this is probably due to loss of a positive effect of estrogen on renal tubular reabsorption of water. Liver function test in the present study it was found that, the concentration of AST, ALT and ALP was elevated significantly in postmenopausal women with mean  $\pm$  SD values was  $28.78 \pm 5.39$ ,  $31.14 \pm 4.42$ ,  $90.32 \pm 22.71$  U/L respectively as compared to premenopausal women who showed mean  $\pm$  SD values  $24.0 \pm 4.58$ ,  $27.06 \pm 6.61$ ,  $72.60 \pm 35.24$  U/L respectively and exhibit altered liver function, as the age advances. Sucheta et al13 also found the same results with same justification. The level of ALT was increased in conditions where cells of the liver have been inflamed or undergone cell death. As the cells are damaged, the ALT leaks into the bloodstream leading to a rise in the serum levels, this indicates that postmenopausal women are more prone to liver damage and exhibit altered liver function, as their age is in advanced stage but in study according to Unfer et al.14 found there was no significant differences were observed among postmenopausal women and premenopausal women in level of AST, ALT.

**CONCLUSION**

This study suggests that there is increase in liver function and kidney function in postmenopausal women as compared to premenopausal women i.e. postmenopausal women have more risk of liver and kidney damage hence a timely health check up must be intensified specially among postmenopausal women.

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