

DEARRANGEMENT OF SOME SERUM OXIDATIVE STRESS ENZYMES AND URIC ACID IN POST MENOPAUSAL WOMEN IN ABA METROPOLIS

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ABSTRACT

Each year, about 1.5 million women transit into menopause and most cases, it is associated with unpleasant symptoms, increases stress and therefore increase health demand for women at this stage of life. Gamma glutamyl transferase (GGT) and lactate dehydrogenase has been highlighted to be up-graded under oxidative stress. And GGT may be an early and sensitive enzyme related to oxidative stress. This study is aimed at assessing the levels of some serum enzymes Gamma glutamyl transferase, Lactate dehydrogenase and Uric acid in post-menopausal women in Aba metropolis. Hundred Female subjects (50 post-menopausal and 50 premenopausal women) were recruited for the study. Blood samples were collected from the subjects by venipuncture and for the determination of Gamma glutamyl transferase, lactate dehydrogenase and uric acid using semi-automated analyzer. Data was analyzed using statistical package for social sciences (SPSS version 21). And one-way analysis of variance (ANOVA). The results were expressed as Mean \pm Standard Deviation. The significance level for the analysis was set at equal to or less than 0.05 ($p < 0.05$). The result of the study showed a significant higher activity and level in Gamma glutamyl transferase and uric acid ($p < 0.05$) in Post-menopausal women and a non-significant lower activity in the level of lactate dehydrogenase when the two studied groups were compared at ($p < 0.05$). Equally observed, was that women above 60 (>60) had the highest mean value of Gamma glutamyl transferase, lactate dehydrogenase and uric acid. And it was observed that there was no correlation between Gamma glutamyl transferase, lactate dehydrogenase and uric acid. This study opines that menopausal women are at risk of developing physiological disorders such as gout, cardiovascular disorders and liver complications. Therefore, attention and lifestyle changes should be adhered to. Normal regular laboratory tests are necessary to identify women who are at risk of developing life-threatening disorders.

Key Words: Gamma glutamyl transferase, Lactate dehydrogenase, oxidative stress, menopause and free radical oxygen species.

INTRODUCTION

Menopause is said to be a period in a woman's life when the ovaries are depleted of oocytes and peptides and steroids are lost (Nelson, 2008). Aging is also said to be a process of morphological, physiological, biochemical and physiological modification offered with increasing in time in living organisms. It also promotes a relative decrease in homeostatic responses causing damage to different systems of the body and menopause may be considered as the Genesis of aging process in women (Godson, 1985).

It brings about series of changes in endocrine system with reduction or stoppage of the production of Estrogen with eventual manifestation of menopause. Post menopause is the absence of menstruation for

up to 12 months categorized by hormonal imbalance (Randolph *et al.*, 2004). Each year, 1.5 million women transit into menopause which often involved troublesome symptoms which may include vasomotor symptoms, vaginal dryness, decreased libido, insomnia, fatigue and joint pains (Demmerstein *et al.*, 2000). Post menopause has been seen to affect different systems of the body including the cardiovascular, muscular, reproductive and immune systems just to mention a few.

In the cardiovascular system, the stoppage in production of Estrogen leads to the accumulation of low-density lipoprotein (LDL) which is used for the synthesis of steroid hormones hence its accumulation leads to cardiovascular diseases such as atherosclerosis and high blood pressure (Muller and Lustgarten, 2007). On the skeletal system, post-menopausal women have also shown increased cases of bone fracture which is often leads to osteoporosis and damage of bone tissues leading to fragility and arthritis (Bart *et al.*, 2009). It had been known that Estrogen contribute to bone mineral density and its reduction leads to bone fragility (Bart *et al.*, 2009).

Menopause is known to be associated with a wide range of physical and physiological symptoms (Muller and Lustgarten, 2007) which may include free radical generation resulting to aging. Estradiol (most active of Estrogen) acts as an antioxidant and free radical scavenger, its mechanism of action is yet unknown (Brooks, 2009). Deficiency in Estrogen Synthesis in post-menopausal women is believed to be a factor in the development of oxidative stress and the release of free radical or oxygen species (ROS). The accumulation of excessive amount of reactive oxygen species (ROS), including peroxide (H_2O_2) and superoxide (O_2^-) is very toxic to cells and as such causing defects and pathologies (Muller and Lustgarten, 2007).

MATERIALS AND METHODS

Uric Acid Estimation

Method: Uric Acid was determined using Agappe uricase test kit (**Product No: 51416002**) based on the enzymatic end point method.

Gamma Glutamyl Transferase Estimation

Method: Gamma Glutamyl Transferase was determined using Agappe Gamma glutamyl transferase test kit (**Product No: 51416007**) based on the enzymatic method (Tietz, 1995)

Lactate Dehydrogenase Estimation

Method: Lactate dehydrogenase was determined using the Agappe lactate dehydrogenase test kit (**Product No: 51407002**) based on the enzymatic method (Tietz, 1995).

Data was analyzed using statistical package for social sciences (SPSS) (Indrayan and Kumar, 2017). The difference between the groups were compared using one-way analysis of variance (ANOVA) and student t-test with a P-value less than or equal to 0.05 ($P < 0.05$) which was considered as being statistically significant. Results were expressed as Mean \pm SD (Standard Deviation).

TABLE 1: COMPARISON OF THE MEAN \pm STANDARD DEVIATION VALUES OF GGT, LDH AND URIC ACID IN POST-MENOPAUSAL WOMEN (TEST) VS PRE-MENOPAUSAL WOMEN (CONTROL)

Parameter	Test n=50	Control n=50	t-value	p-value	Sig
GGT (IU/L)	42.85 \pm 12.66	26.57 \pm 15.96	2.75	0.009	Sig
LDH (IU/L)	187.30 \pm 15.78	179.8 \pm 18.08	0.18	0.862	NS
Uric Acid (mmol/L)	0.5 \pm 0.13	0.3 \pm 0.08	5.89	0.000	Sig

KEYWORDS: The following abbreviations stand for :

GGT- Gamma Glutamyl Transferase

LDH- Lactate Dehydrogenase

Sig- Significant

NS- Not Significant.

TABLE 2: COMPARISON OF THE MEAN \pm STANDARD DEVIATION VALUES OF GGT, LDH AND URIC ACID IN POST-MENOPAUSAL WOMEN BASED ON AGE.

Parameter	(40-50) yrs n=50	(50-60) yrs n=50	>60 n=10	f-value	P-value	Sig
GGT (IU/L)	39.75 \pm 14.25	43.25 \pm 7.11	44.16 \pm 8.24	4.20	0.085	NS
LDH (IU/L)	178.11 \pm 20.78	180.25 \pm 14.25	189.25 \pm 2.4	5.41	0.242	NS
Uric Acid (mmol/L)	0.4 \pm 0.14	0.5 \pm 1.62	0.51 \pm 0.71	2.22	0.095	NS

KEYWORDS: The following abbreviations stand for:

GGT- Gamma Glutamyl Transferase

LDH- Lactate Dehydrogenase

Sig- Significant

NS- Not Significant.

TABLE 3: CORRELATION OF URIC ACID WITH GGT AND LDH IN POST-MENOPAUSAL WOMEN

Variable	N	r	P-value	Sig
GGT	50	-0.11	0.647	NS
LDH	50	0.24	0.316	NS

KEYWORDS: The following abbreviations stand for:

GGT- Gamma Glutamyl Transferase

LDH- Lactate Dehydrogenase

Sig- Significant

NS- Not Significant.

The result of the study showed a remarkable increase in the activities of gamma glutamyl transferase and uric acid in post-menopausal women when compared to control. However, there was no much difference in the value of Lactate Dehydrogenase when the two groups (test and control) were

compared. This present study collaborates the finding of Omar *et al.*, (2010) but it is in contrast to the finding of Dada *et al.*, (2012) which revealed, significant increase in Lactate Dehydrogenase in post-menopausal women when compared to control and this was more obvious with age and this was related to the decline in estrogen level with increase in age.

The increase in gamma glutamyl transferase, lactate dehydrogenase and uric acid in post-menopausal women, may be as a result of the reduction of estradiol. It should be noted that estradiol is the active form of estrogen and scavenger of free radical and acts as an antioxidant with menopause there is decline in estrogen and increase in free radical generation. Therefore, Menopause onset causes generation of reactive oxygen species leading to oxidative damage particularly to cardiovascular system and equally contribute to the fragility of the bones by affecting the skeletal/ muscular system. Estrogen plays a protective role and its lack predispose or increases women's risk of developing various acute and chronic diseases such as myocardial infarction, coronary heart disease and stroke (Grady *et al.*, 1992).

The increase of uric acid level in menopausal women compared to pre-menopausal women is not surprising, considering that, with age there is increase in cells death. Elevation of uric acid level may account for both arthritis and gout which these Post-menopausal women are predispose to. (Ames, et al 1981 and Kaur and Halliwall 1990).

This study has demonstrated the increase of these antioxidative enzymes in postmenopausal women. These parameters should regularly be checked as to take immediate action whenever certain symptoms are observed.

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