ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Study the Effect of Serum Alkaline Phosphatase Activity (ALP), Calcium and Total Protein Levels in Women Hypertensive Patients.

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ABSTRACT

Hypertension is a popular and critical chronic health problem and a disturbance that is described by a steady elevate in scales of blood pressure. The objective of the current study was to examine the relevance between serum Alkaline phosphatase activity , calcium , and protein in women hypertensive patients that have taken the antihypertensive drugs, A total of eighty women were divided in to two groups : (thirty women) : Firstly a control group and secondly group women patients. Serum Alkaline phosphatase (ALP)activity and total protein was significant Elevated to 247.75 u/L , 8gm/dL respectively compared with their in healthy women while Calcium level was decreased 7.83mg/dL in patients . No significant differences between the exposure time for antihypertensive drugs for less year and more than year in each biochemical levels (AIP, Total protein and Calcium) in hypertensive patients. The existence of a positive relationship between total protein and Alkaline phosphatase activity.

Keywords: ALP, Calcium, Total Protein, hypertension.

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ISSN: 0975-8585

INTRODUCTION

Cardiovascular diseases become a leading reason of the rate of disease in population and death-rate in every part of the world . Conforming to world Health Organization (WHO), almost one-third of the world's people undergoes from high blood pressure and the happening has been elevating at a fast rate due to life style revise [1]. High blood pressure is a disturbance that is described by a steady elevation in levels of blood pressure is popular and climacteric chronic health problem known as the most important risk factor for cardiovascular disease (CVD) everywhere the world [2]. Many artificial drugs have been advanced for the medication of high blood pressure because of the gravity and spread of the disease. Most of these drugs have pretend better activity but they have a number of side effects[3]. The wide diversity of first-Line operators ready for managing a hypertensive involve diuretics ,beta adrenergic receptor blockers ,angiotensin transform enzyme inhibitors ,and calcium channel blockers .Additive agents used for second –line treatment and particular indications, such as pregnancy and hypertension crises.[4] Alkaline phosphatase (AIP) [EC.3.1.3.1] is an enzyme that stimulates the hydrolysis of organic pyrophosphate and suppression of vascular calcination . AIP is expressed in a diversity of tissues and its found with highest concentrations are in bone, liver and kidney. Serum levels of AIP are used in clinical application as indicator of hepatic , peripheral Vascular and bone disease [5]. Previous study reported that AIP was significantly associated with hypertension and another study found weak association of AIP with blood pressure [6]. The calcium ion has a prime role as an intracellular second messenger in excitement contraction coupling in cardiac and smooth muscle cells. The free intracellular calcium level , thus determines the stress in Vascular smooth muscle cells therapy perform in peripheral vascular resistance [7]. Previous essays have a positive partnership between serum calcium and hypertension, other reported an reverse or no association[8]. Serum proteins levels are among the most popular biochemical indicators measured regularly as screening tests for detecting implied disease or for monitoring disease effectiveness[9]. The aim of this study was to compare the activity of Alkaline phosphatase with Calcium and total protein in female hypertensive patients that have antihypertensive drugs.

MATERIALS AND METHODS

Subjects

In this study Eighty women blood samples (serum) were collected and divided in two groups: Thirty healthy women with age (20-70) years were compared to sixty hypertensive women (30-70) years. All patients have differently antihypertensive drugs.

Methods

Three milliliters of blood sample was collected from each subject by Venipuncture. The collected samples were centrifuged for 5min at 2000rpm to obtain serum. The separated serum samples were analyzed for Bio clinical tests.

Bio clinical tests

Alkaline phosphatase (ALP) activity was evaluated by method of Rosalki *et al*.[10]. Calcium was determined by the method of Gindler and king [11],and total protein by method of Friedman and young[12].

Statistical analysis

The data was analyzed using statistical Analysis system (SAS) to study the effect of different factors according to complete Random design (CRD) with less standard deviation [13].

RESULTS AND DISCUSSION

Alkaline phosphatase activity (AIP)

Figure (1) illustrates a highly significant ($P<0.01$) increases in the activities of AIP in serum patients with hypertensive was reached 247.75 U/L compared with healthy women was reached 137.40 U/L.

ISSN: 0975-8585

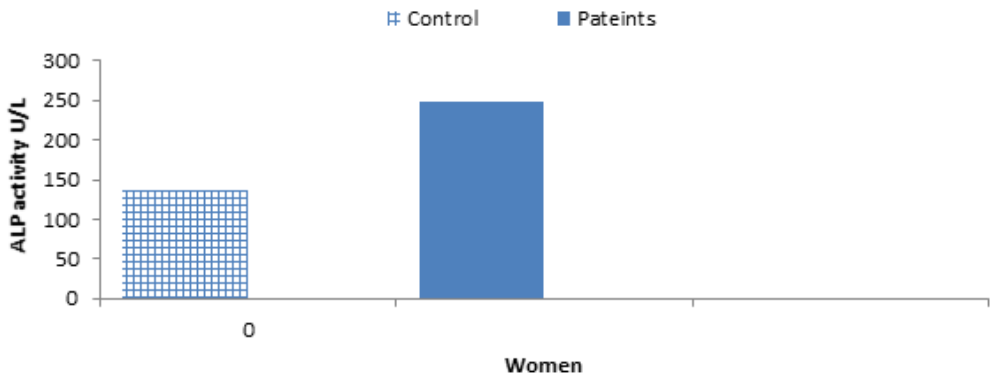

Figure 1: The Comparison between Alkaline phosphate activity(ALP) level in control and hypertensive patients

Calcium Level

Decreased serum calcium in hypertensive patients was highly significant decreases (P<0.01) and it was reached 7.83mg/dL compared with control 9.32mg/dL as shown in Figure (2).

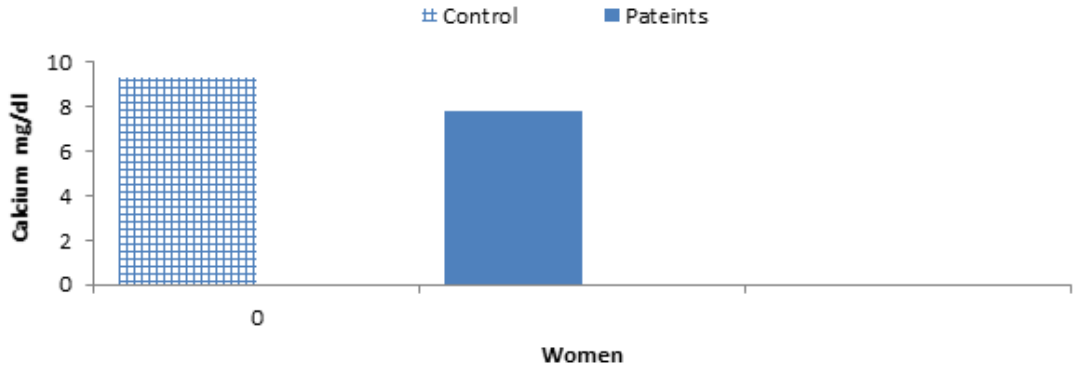

Figure 2: The Comparison between Calcium level in control and hypertensive patients

Total protein Level

Figure (3) presents the serum total protein level was 7.55gm/dl in healthy women while it was slightly increased (P<0.05) 8gm/dl in hypertensive patients.

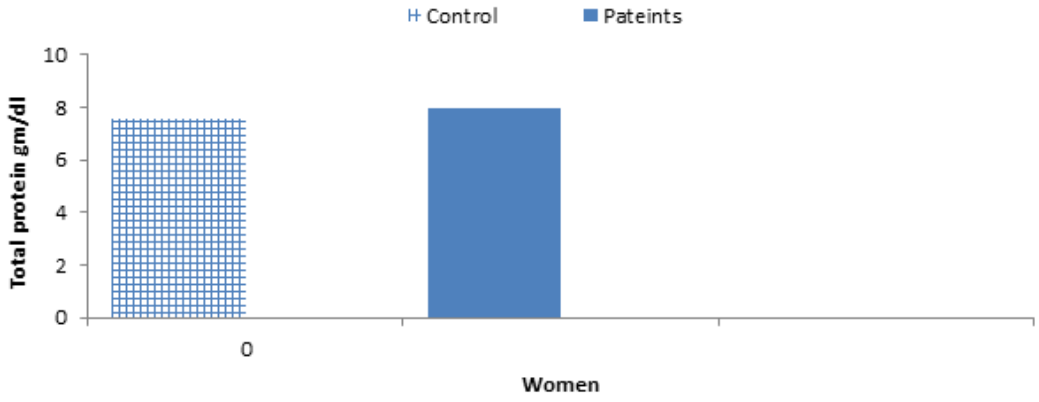

Figure 3: The Comparison between Total protein level in control and hypertensive patients

Effect of Duration treatment of antihypertensive drugs on serum Alkaline phosphatase, Calcium and Total protein in serum

The administration of antihypertensive drugs for duration treatment for Less one year and more than one year was studied as shown in Table (1). Calcium Level was elevated to 8.91mg/dL for less one year compared with more than one year while Alkaline phosphatase activity and total protein decreased than those for more one year.

Table 1: Association between serum Alkaline phosphatase activity, Calcium , Total protein and duration treatment of antihypertensive drugs Less and more one than year

Exposure of time anti-hypertensive drugs	Standard error ± mean		
	AIP U/L	Total protein gm/dL	Calcium mg/dL
Less one year	163.18± 11.41	7.59±0.12	8.91±0.17
More than year	253.61 ±14.03	8.15±0.15	7.87±0.22
T-Test value	38.75	0.417	0.614
Significant Level	**	**	**

The correlation factor between biochemical analysis was described in Table(2).It's illustrates a significant negative (P<0.01) relationship between Calcium with total Protein was -0.35. The same effect was observed (P<0.05) between calcium and Alkaline phosphatase AIP was -0.70 on the other hand a significant positive (P<0.05) Correlated was reached 0.53.

Table 2: The correlation factor between Alkaline phosphatase (AIP), Calcium and total protein in hypertensive patients

Parameters	Correlation factor (r)	Significant Level
Calcium and Total protein	-0.35	*
Calcium and Alkaline phosphatase	-0.70	**
Total protein and Alkaline phosphatase	0.53	**

Probability (P) *(P<0.05) ** (P<0.01)

In the running study the elevated of Alkaline phosphatase activity in hypertensive patients may be attributed to cholestasis promotes the synthesis and release of AIP, and accumulating bile salts increase AIP release from the cell surface [14].Tonelli , *et al* [15] reported that a high number of ALP Level of can be used as a indication for patients with implied inflammatory state, Vascular calcination and as liver function . El-khawaga , *et al* [5]. Indicated some of antihypertensive drugs have elevation in effectiveness of AIP in Liver, spleen and kidney of mice. Lower serum calcium levels were found in hypertension patients compared with healthy women due to the role of parathyroid gland in hypertension, also renin profile could also affect the relevance between Calcium and blood pressure [16]. Some prior essays have reported an reverse partnership between serum ionized Calcium and hypertensive, this may be attributed to the alteration in extra cellular binding of Calcium or the interaction between Serum Calcium and other cations such as magnesium ,sodium , and potassium [17]. Cohu was studied the effect of treatment of hypertensive patients with Calcium channel blockers that lower blood pressure by suppression trans membrane transport of Calcium through membrane channels [18]. Further, the current result is consistent with the result of other searchers[19] Who reported that the Amlodipine is one of Calcium channel blockers that have suppress Calcium entrance through Voltage-gated trans membrane L-type channels, thus reduction intercellular calcium concentration and stimulating smooth muscle relaxation. The presence of significant amounts of protein in the hypertensive patients may be attributed to direct effect of hypertension and its related complications on renal function[20]. The alterations in AIP activity , total protein and Calcium levels in serum of hypertension patients that have anti-hypertension drugs may reflect that the toxic effects of drugs may be, biochemical, structural, specific and functional [21].

Conclusion: Various antihypertensive drugs that influence on hypertensive patients, Alkaline phosphatase (AIP) activity and total protein were significantly elevated in hypertensive patients that have taken

antihypertensive while calcium level was decreased. No significant differences between exposure time of drugs less year and more than year.

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