

# Relation Of Serum Tetranectin with Pathogenicity of Chronic Hypertension Patients in Kirkuk City

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## Abstract

**Background:** Hypertension has been identified by WHO as one of the most significant risk factors for morbidity and mortality worldwide and is responsible for the deaths of approximately nine million people annually. **Aim of the study:** The aim of this study was to evaluate the relation of serum tetranectin, atrial natriuretic and other biochemical parameters with hypertension and possibility of use these parameters in development of hypertension. **Material and Methods:** The current study is case control study conducted on 90 Iraqi participants (25-85 years) during the period between 10th of January to 10th of April 2022, participants from in Kirkuk city. The study included 60 patients previously diagnosed with hypertension who's from both sexes whose age were between 36 and 85 years. Hypertension, defined as a systolic blood pressure greater than 130 mmHg or a diastolic blood pressure greater than 80 mmHg or are taking medication for hypertension. These patients included when attended to Kirkuk General Hospital. The study also included 30 healthy individuals with same age range and from both sexes who apparently haven't any chronic diseases. Blood samples collected for determination of human Tetranectin and ANP by enzyme-linked immunosorbent assay (ELISA). **Results:** The study showed that the mean of tetranectin was (116.4 pg/ml) in patients with hypertension which was significantly lowest than that in the healthy control group (148.6 pg/ml) at P. value: 0.003. The study no correlation of tetranectin with each of cholesterol and triglyceride, HDL, LDL and VLDL among hypertensive patients. It was concluded that the lowest means of tetranectin was in patients with hypertension and advice to use tetranectin as predictor for hypertension and management tool in cardiovascular disease.

**Keywords:** Hypertension; Tetranectin; Lipid profile; Kirkuk; Blood pressure

## 1. Introduction

Hypertension has been identified by WHO as one of the most significant risk factors for morbidity and mortality worldwide and is responsible for the deaths of approximately nine million people annually (1). In the UK, the National Institute for Health, and Care Excellence (NICE) defines high blood pressure (BP), also known as hypertension, as a clinic blood pressure of 140/90 mmHg or higher confirmed by a subsequent ambulatory blood pressure monitoring daytime average (or home blood pressure monitoring average) of 135/85 mmHg or higher (2-4). The Global Burden of Disease study has shown that non-optimal BP continues to be the biggest single risk factor contributing to the global burden of disease and to global all-cause mortality, leading to 9.4 million deaths and 212 million lost healthy life years (8.5% of the global total) each year (5,6). According to the latest WHO data published in 2020 Hypertension Deaths in Iraq reached 2,451 or 1.67% of total deaths. The age adjusted Death Rate is 16.27 per 100,000 of population ranks Iraq (7). Like the kidney, the heart plays an important role in regulating salt and water balance. This function is mediated mainly by a cardiac hormone, atrial natriuretic peptide (ANP). When blood sodium levels and pressure are increased, ANP is secreted from the

heart. It binds to its receptor in the kidney and blood vessels, and promotes salt excretion, lowers blood volume and relaxes the vessel (8). Numerous biomarkers of interest were identified in this discovery study that may be further investigated to determine their value as a single biomarker or in combination with ANP. Herein we describe a protein with limited known function called Tetranectin that was significantly reduced in coronary sinus serum of asymptomatic patients with elevated ANP. Tetranectin, gene name CLEC3B, is a calcium-binding homotrimeric protein from the C-type lectin family of proteins. It is primarily found in serum and in the extracellular matrix (ECM) during development, tissue regeneration and cancer, with low levels in normal adult tissue (9). Tetranectin potentially has an important role in tissue remodelling due to its ability to bind ECM components (fibrin, plasminogen), stimulate proteolytic activation of proteases and growth factors, and regulate ECM proteolysis. It has been suggested to have a protective function within the muscle, bone, and the circulatory system. Serum concentrations of Tetranectin decrease in pathological conditions such as cancer, inflammatory diseases, and coronary artery disease (10,11). The aim of this study was to evaluate the relation of serum tetranectin, atrial natriuretic and lipid profile with hypertension and possibility of use these

parameters in development of hypertension

## 2. . Material and Methods

The current study is case control study conducted on 90 Iraqi participants (25-85years) during the period between 10th of January to 10th of April 2022, participants from in Kirkuk city. The study included 60 patients previously diagnosed with hypertension who's from both sexes whose age were between 36 and 85 years. Hypertension, defined as a systolic blood pressure greater than 130 mmHg or a diastolic blood pressure greater than 80 mmHg or are taking medication for hypertension. These patients included when attended to Kirkuk General Hospital. The study also included 30 healthy individuals with same age range and from both sexes who apparently haven't any chronic diseases.

### Inclusion criteria

Patient were selected with hypertension on treatment and selected control after showing normal blood pressure measurement

### Exclusion criteria

relative subjects are excluded also, any patient presented with:

- 1-diabetics
- 2-arterial thrombosis
- 3-angina
- 4-heart attack
- 5-pregnancy
- 6-liver disease

## Ethical approval

-Approval of the council of College of Medicine/ Tikrit University was obtain for the proposal of the study.

-Approval permission was presented to the director of Kirkuk Health directorate / Kirkuk General Hospital.

-Questionnaire was developed by the researcher for the purpose of the study to assess the domains related to hypertensive patients (Disease, Signs and Symptoms Blood Pressure, and Dietary Patterns, etc).

## Collection of blood samples

After at least 12 hours of fasting ,blood was collected by vein puncture with plastic disposable syringes took up to 5ml of venous blood from each healthy control and patient and added to the gel tube ,which was then left at room temperature for 30minutes in order to initiate the clotting process ,the sample was then centrifuged to separate the serum at 3,000xg for 15 minutes and the obtained serum were aspirate using mechanical micropipette and transferred in to eppendrof tubes and stored in deep freez at-20C for determination of human Tetranectin by enzyme-linked immunosorbent assay (ELISA).

## 3. Results

The study showed that the mean of tetranectin was (116.4 pg/ml) in patients with hypertension which was significantly lowest that than in the healthy control group (148.6 pg/ml) at P. value: 0.003, Table 1.

Table 1: Comparison between hypertensive patients and the control group regarding the level of tetranectin				
Studied groups	No.	Tetranectin (pg/ml)		P. value
		Mean	SD	
HT patient	60	116.4	15.7	≤0.003
Control group	30	148.6	55.6	

The study showed no correlation of tetranectin with each of cholesterol and triglyceride, HDL, LDL and VLDL among hypertensive patients (Figures 1 to 5).

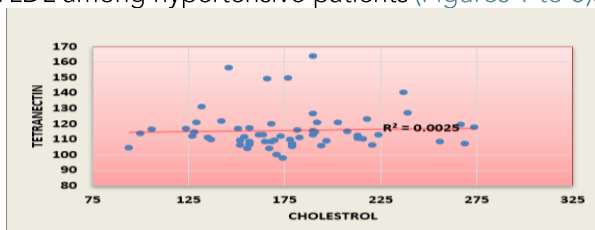


Figure 1: Correlation between tetranectin and cholesterol levels among hypertensive patients

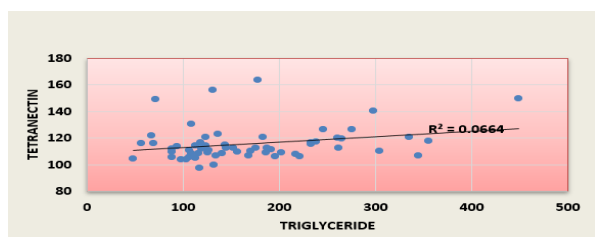


Figure 2: Correlation between tetranectin and TG levels among hypertensive patients

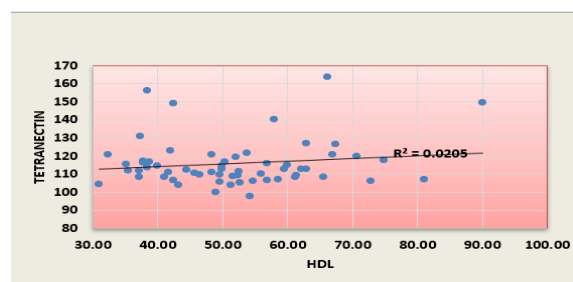


Figure 3: Correlation between tetranectin and HDL levels among hypertensive patients

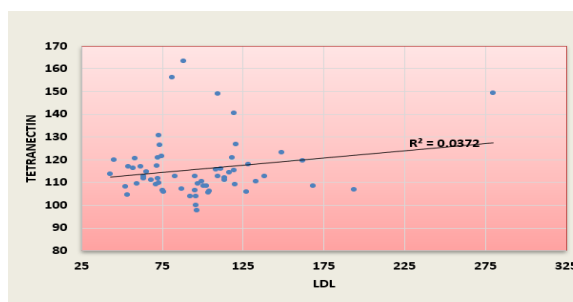


Figure 4: Correlation between tetranectin and LDL levels among hypertensive patients

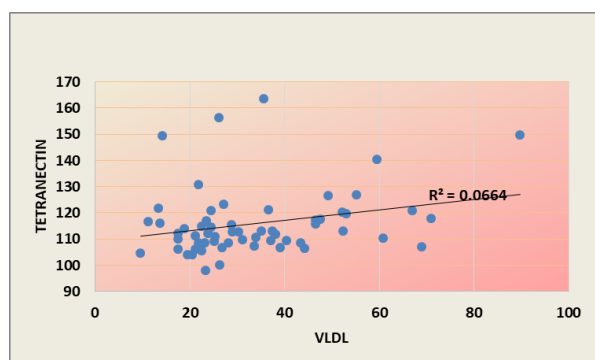


Figure 5: Correlation between tetranectin and VLDL levels among hypertensive patients

## 4. Discussion

The study showed that the mean of tetranectin was (116.4 pg/ml) in patients with hypertension which was significantly lowest than in the healthy control group (148.6 pg/ml) at P. value: 0.003, Table 1. Abnormal changes of coagulation and fibrinolysis system play a vital role during the progression of CAD (12). Tetranectin (TN) suggested among as predictors of atherosclerotic cardiovascular disease after adjusting for established risk factors (13). In agreement with our finding, Swaminathan et al (10) found that tetranectin was reduced in patients with hypertension as compared with healthy control group and suggested that TN was useful as biomarker in hypertension. McDonald et al (11) found that patients with hypertension had lower levels of tetranectin compared to healthy controls and concluded that TN considered to be potential novel diagnostic biomarker of heart failure. In another study, patients with either risk factors for heart failure (hypertension and/or diabetes) or with heart failure, we demonstrate that circulating levels of Tetranectin are significantly decreased in those with HF (14). In agreement, Zaid et al (15) indicated that the level of atrial natriuretic peptide (ANP) showed positive correlation with serum cholesterol and triglyceride among hypertensive patients. Recently, several lines of evidence have suggested that ANP is involved in lipid metabolism in different ways. Gabriella Garruti et al (16) found that ANP was expressed in and secreted from subcutaneous and visceral adipose tissue and pre-adipocytes. Dedoussis et al (17) found that ANP gene G664A polymorphism was associated with lower levels of apoA- I and HDL-C in familial hypercholesterolemia patients. Osajima et al (18) found that NT-proANP levels were negatively correlated with Triglyceride in the hypertensive group.

### Conclusions and Recommendations

It was concluded that the lowest means of tetranectin was in patients with hypertension and advice to use tetranectin as predictor for hypertension and management tool in cardiovascular disease.

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