

Comparison of Serum Resistin Level in Patients of Hypertension and those with Coronary Artery Disease

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ABSTRACT

Objective: The aim of this study is to determine the relationship between serum resistin level in patients of hypertensive coronary artery disease and patients with only coronary artery disease.

Study Design: Comparative

Place and Duration: Conducted in Sahiwal Medical College and DHQ hospital Sahiwal for duration of six months from 15th November 2019 to 15th April 2020.

Methods: Total 180 patients of both genders were included in this study. Patients' detailed demographics including age, sex and body mass were recorded after taking written consent. Patients were divided into two equal groups I and II. Group I had hypertensive patients and group II had coronary artery disease patients. Serum resistin level was measured between both groups. Complete data was analyzed by SPSS 24.0 version.

Results: Equal number of males and females were included in both groups. Mean age of the patients in group I was 54.83 ± 12.09 years with mean BMI 27.14 ± 7.18 kg/m², while mean age in group II was 53.38 ± 12.90 years with BMI 26.41 ± 9.18 kg/m². Serum resistin in hypertension was high as compared to coronary artery disease. The values of serum resistin, triglycerides and low-density lipoproteins were found progressively high in group I as compared to group II.

Conclusion: Serum levels of resistin, triglycerides and LDL are significantly raised while serum HDL levels are significantly lowered in patients of hypertension and coronary artery disease.

Keywords: Coronary artery disease, Hypertension, Resistin, Lipid profile

INTRODUCTION

Clinical studies found that adipocytokines play a significant role in development of atherosclerotic cardiovascular disorders in addition to classical risk factors such as hypertension, dyslipidaemia and insulin resistance.¹⁻³

Higher blood pressure (HTN) is classified as blood pressure, greater than 140/90 mm hg, according to 'Seventh Report of the Joint National Committee on the Prevention, Diagnosis, Experiment and Therapy of High blood pressure' (JNC-7)⁴. As a global epidemic, HTN is a disease that primarily affects the heart and vasculature. In 1990–1994 a Pakistan Medical Research Council survey recorded hypertension of 33% in adults over the age of 45⁵. Ischemic heart Disease (IHD) is a condition affecting coronary arteries which results in reduced cardiac muscle blood supply. Atherosclerosis is a chronic inflammatory process in the intimate layer of major arteries due to buildup of plaques. Atherosclerotic plaques cause progressive narrowing and obstruction of the coronary arteries (MI)⁶, which ultimately cause reduced myocardial blood flow leading to clinical presentation of angina pectoris and myocardial infarction.

The world's main health issues, particularly in adults, are obesity and coronary artery disease^{1,7}. CAD is one of the major atherosclerotic manifestations correlated with clinical evidence of acute coronary syndrome, including angina and myocardial infarction. A prominent risk factor in CAD is obesity, which is the main dietary disturbance in developed countries^{8,9}. Evidence suggests that certain types of obesity, especially elevated abdominal fat, can contribute to metabolic disturbances and vascular diseases²⁻¹⁰. The cardiovascular risk predictive factor¹¹ may

be influenced by regional fat distribution, notably the amount of visceral fat around your core¹².

Resistin and leptin are assumed to be the cause of cardiovascular disease in the developed world and in particular, of atherosclerotic coronary arteries disease and congestive heart failure^{13,14}. Resistin and leptin levels have been linked to an enhanced body mass index (BMI)^{15,16}, and their receptors are increased in abdominal fat in the patients of cardiovascular diseases. During the examination, diagnosis and estimation of atherosclerosis, a high CAD prevalence makes assessment of the serum levels of Adipokines as a prognostic marker. We have therefore conceived this study to look at the relationship between resistin and leptin variation with obesity and CAD¹⁷.

Resistin also causes the increased hepatocytic production of lipoproteins especially LDL and triglycerides. As a result there is increase trapping of the cholesterol and triglyceride in the infiltrated macrophages. All these factors promote endothelial dysfunction, proliferation of vascular smooth muscle cell (VSMC) and migration leading to atherothrombosis, HTN and coronary artery disease (CAD).

MATERIAL AND METHODS

This comparative study was conducted in Sahiwal Medical College and DHQ hospital Sahiwal for duration of six months from 15th November 2019 to 15th April 2020 and included 180 patients. Patients' detailed demographics such as age, sex and BMI was recorded after taking written consent. Patients with obesity (BMI ≥30 Kg/m²), acute or chronic inflammation, or endocrinological disorder were excluded.

All the patients were divided into two equal groups; group I and II had 90 patients each with equal number of males and females. Group I had hypertensive coronary artery disease patients and group II had only coronary artery disease patients. Serum resistin level was measured between both groups. The serum lipid profile was calculated with the Fluidest kit, the Serum LDL and HDL by enzyme colorimetric process (precipitation method), while the Crescent Diagnostics kit, Jeddah, Saudi Arabia, was used to estimate serum triglycerides. The Microlab 300 projections were made (Spinreact). Correlation of resistin and serum LDL, HDL, and triglyceride was identified by the application of Pearson's correlation coefficient. All the data was analyzed by SPSS 24.0.

RESULTS

Total 180 patients with both genders were included in this study. Equal number of males and females were included in both groups. Mean age of the patients in group I was 54.83 ± 12.09 years with mean BMI 27.14 ± 7.18 kg/m², while mean age in group II was 53.38 ± 12.90 years with BMI 26.41 ± 9.18 kg/m². (table 1)

Table 1: Demographic details of enrolled cases between both groups (n=180)

Variables	Group I(n=90)	Group II(n=90)
Gender		
Males	45	45
Females	45	45
Mean age(Yrs)	54.83 ± 12.09	53.38 ± 12.90
Mean BMI(kg/m2)	27.14 ± 7.18	26.41 ± 9.18

In group I values of serum resistin 22.04±6.124, LDL310±12.09, HDL38.14±3.98 and triglyceride 242.20±54.62 of the enrolled patients (n=90) were significantly higher than that of the group II value of serum resistin being 8.46±2.09, LDL was 134.09±35.48, HDL was 68.04±22.73 and value of triglyceride was 144.56±35.47 with p value <0.03. This concluded that Serum HDL levels were significantly decreased in study group I as compared to group II (table 2).

Table 2: Comparison of serum resistin, LDL, HDL and triglyceride among both groups

Variables	Group I	Group II
Serum resistin (ng/ml)	22.04±6.124	8.46±2.09
LDL (mg/dl)	310±12.09	134.09±35.48
Triglyceride (mg/dl)	242.20±54.62	144.56±35.47
HDL (mg/dl)	38.14±3.98	68.04±22.73

P-VALUE <0.05

DISCUSSION

The aim of this study is to determine the serum resistin level between the patients of hypertension and coronary artery disease. We concluded that serum resistin level of hypertensive group was significantly higher than that of coronary artery disease. Our results were comparable to the previous studies conducted by SobiaNiaz et al in 2019¹⁸. An older study conducted by Montazerifar F et al also presented relatable results in cross-sectional study of serum resistin and leptin levels with obesity and coronary artery disease (CAD)²⁴.

A high serum leptin level in patients with CAD was observed in our research in line with previous studies of Lee SE et al and Wallace AM^{19,20}. The function of this hormone as a human-based atherosclerotic mediator was recommended. In comparison, there is data that show that leptin may protect in particular animal models against atherosclerosis, and a study did not detect any significant difference between controls and CHD patients²¹.

In contrast to the normal subjects, our findings demonstrated increased serum resistin concentrations in hypertensive patients and CAD. The findings of the analytic investigation indicate that higher levels of resistance have been observed compared with standard intensives in hypertensive patients. The ties between serum resistin, HDL, LDL and triglyceride have been investigated in the current research in both daily participants and in patients with a different degree of cardiovascular disease. There was no link between serum resistin, and lipid parameters. In a study of women with Metabolic Syndrome positive association of resistin was found with serum triglyceride, cholesterol and VLDL while negative association was observed with HDL^{22,23}. In an observational study serum resistin was positively correlated with LDL and triglycerides in the first degree relatives of diabetic patients suggesting its involvement in the causation of dyslipidemia even in normal participant²⁴.

No association between serum resistin and CAD in obese participants was seen despite a lot of supporting evidence, but controversial findings were also seen. Resistin and leptin promote CRP development in coronary endothelial cells, and CRP triggers vascular thrombosis which may be part of pathophysiology of acute coronary syndrome. This is explained in conjunction with sample size. In our research, there is no association between CRP, serum resistin, and BMI in CAD patients that indicates leptin and resistin are correlated with CAD risks irrespective of CRP^{25,26}.

CONCLUSION

The level of serum resistin, triglyceride and LDL is increased dramatically and the level of serum HDL slightly decreased in hypertensive patients and coronary artery disease. While more studies are needed in this regard we can try to check serum resistin levels in younger patients to ascertain the possibility of developing hypertension in future.

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