

Correlation Of Microalbuminuria With Left Ventricular Hypertrophy In Treatment Naïve Hypertensive Patients

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Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Keywords: NIL

Introduction

Hypertension is often referred to as a silent killer because most of the times patients with hypertension are asymptomatic, but its complications can be fatal for a patient. Its complications including Cerebrovascular accidents, Coronary artery disease, Heart failure, Chronic kidney disease can cause serious morbidity and mortality.

So it becomes imperative to keep the blood pressure in check so as to prevent all the above complications. Left ventricular hypertrophy is one of the earliest cardiac change in patients with hypertension. LVH which is defined as an increase in the LV mass is one of the forerunners in causing significant cardiovascular events^{1,2,3}. Also microalbuminuria has been shown to be harbinger of not only the renal but also the cardiac complications^{4,5,6,7,8,9}. Even very low Microalbuminuria has been shown to be the predictor of cardiovascular mortality^{10,11}. Microalbuminuria often results from the diffuse endothelial dysfunction¹². Reduction of Blood pressure and thereby regression of microalbuminuria and LVH have been shown to reduce the cardiovascular morbidity and mortality significantly¹³.

The present study aims to find out the prevalence of these two complications i.e, LVH and

microalbuminuria in treatment naïve hypertensive patients and to find out the correlation between them.

Materials And Methods:

This was a cross sectional study conducted in a tertiary care teaching hospital in North India in which about 200 inpatients and outpatients satisfying the inclusion and exclusion criteria were enrolled. The study was approved by the institutional ethical committee. Informed consent was obtained from all the patients.

Inclusion Criteria:

All treatment naïve essential hypertension patients aged 18-70 years were included

Exclusion Criteria:

Patients with history of renal disease or cardiovascular disease, smoking, Secondary hypertension, Diabetes, history of fever or Urinary Tract Infections were excluded from the study.

Detailed history was taken and thorough clinical examination was performed. Patients then underwent routine baseline investigations including Complete blood count, Renal function test, Liver function test, Electrocardiograph, Urine microscopy, Chest X ray, Fasting and post prandial blood sugar, Lipid profile,

24 hr urine albumin levels and 2D Echocardiography was performed.

Microalbuminuria was defined as 24 hr urine albumin excretion of 30-300 mg/24 hours.

Left Ventricular Hypertrophy was defined after correction of body surface area as : Left ventricular Mass/Body surface area and expressed as g/m². LVH was considered to be present when it was >131g/m² in males and >100g/m² in females.¹⁴

LVM was calculated by following formula developed by Devereux *et al* :

$$LVM=0.80 \times (1.04 [IVST + PWT + LVID]^3 - LVID^3) + 0.6g$$

Where, IVST is the interventricular septal thickness, PWT is posterior wall thickness, LVID is the left ventricular internal diameter, 1.04 = specific gravity of the myocardium and 0.8 is the correction factor.¹⁵

Statistical Analysis:

The data was analysed using SPSS 16.0. The categorical values were analysed using the Chi Square test and students T Test was used for analysis of the ordinal scale data. Karl Pearson correlation coefficient was used to calculate the correlation between two variables. P value <0.05 was taken as significant.

Results:

A total of 200 newly detected hypertensive patients were enrolled including 110 (55%) males and 90 (45%) females. Mean age of all patients was 52.02±6.78 whereas, mean age of males was 51.65±7.07 and females was 52.46±6.42.

Microalbuminuria was found in 64 patients (32%) including 35 males(31.8%) and 29 females(32.2%) suggesting no significant gender difference(p value 0.957). LVH was present in 67 patients (33.5%) including 36 males(32.7%) and 31 females(34.4%) with no significant difference between two groups(p value 0.798). Microalbuminuria was found in 52 out of 67 patients(77.6%) with LVH and 12 patients with microalbuminuria did not have LVH suggesting a higher prevalence of microalbuminuria in LVH patients and this difference was statistically significant (p< 0.001).

There was positive correlation of microalbuminuria with systolic blood pressure (r = 0.084, p = 0.239)

and negative correlation with diastolic blood pressure(r= -0.025, p = 0.727) but these were not statistically significant.

Left ventricular hypertrophy was found to be positively correlated with systolic blood pressure(r = 0.075, p =0.294) and negatively correlated with diastolic blood pressure(r = -0.041, p = 0.566).

The correlation of age with microalbuminuria(r = -0.052, p = 0.041) and with left ventricular hypertrophy (r = 0.051, p =0.474) was statistically non significant.

Discussion

Microalbuminuria and Left ventricular hypertrophy are the complications of hypertension that develop over a period of time due to uncontrolled blood pressure. The presence of LVH and Microalbuminuria in naïve hypertensive patients indicate that these patients remain unaware of their high BP for a pretty long time before reporting to a physician.

Long standing uncontrolled hypertension leads to development of both cardiovascular and renal complications irrespective of the gender.

Presence of microalbuminuria was found high in hypertensive patients with LVH compared to those hypertensives without LVH. Similar to our study, Monfared¹⁶ et al also found high prevalence of microalbuminuria in patients with LVH compared to those without LVH.

In our study, Systolic blood pressure was found to have positive correlation with microalbuminuria. The study by Maggon RR¹⁷ et al also found significant positive correlation of Systolic Blood pressure with microalbuminuria.

Microalbuminuria can be contributed to chronic inflammation and endothelial dysfunction in patients with hypertension. Stein¹⁸ et al showed that microalbuminuria is associated with increased cardiovascular mortality. Thus the presence of microalbuminuria is an early marker of cardiac structural abnormality.

Conclusion:

Uncontrolled and sub optimally controlled blood pressure pose a risk for development of cardiac and renal complications . It is important to screen

individuals for hypertension and its complications at regular intervals.

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