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Prevalence of microalbuminuria in patients with essential hypertension- A clinical study

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Abstract

Background: The present study was conducted to record prevalence of Microalbuminuria in patients with essential hypertension.

Materials & Methods: The present study was conducted on 102 patients of diagnosed essential hypertension of both genders. Microalbuminuria was measured in all patients in a 24h urinary sample.

Results: Out of 102 patients, males were 62 and females were 40. Out of 102 patients, microalbuminuria was present in 40 patients. Maximum cases were seen in age group >70 years (20) followed by 6-70 years (14), 50-60 years (4) and 40-50 years (2).

Conclusion: Authors found the presence of microalbuminuria in a significant number of newly detected and untreated patients of essential hypertension.

Keywords: Essential hypertension, microalbuminuria, coronary heart disease

Introduction

Hypertension is a disorder of circulatory regulation. Sustained hypertension causes accelerated atherosclerosis with consequent coronary heart disease (CHD), heart failure, and stroke and renal failure. If untreated, approximately 50% of patients develop heart disease, 33% develop stroke, and 10%-15% develop renal failure ^[1].

Hypertension (HT) is a growing public health problem and it is now being widely reported in many rural and urban parts as one of the commonest cause of morbidity and mortality ^[2]. The reasons for this growing burden are multiple, ranging from socio-economic changes and genetic influence. At a genetic level, there is growing evidence showing an association between elevated diastolic BP and CaMK4 affecting endothelial functions like controlling vascular resistance hence increasing the risk of HT ^[3].

Microalbuminuria is an early indicator of renal damage and has been demonstrated as one of the principal predictive factors of cardiovascular (CV) complications, all cause and cardiovascular mortality independent of the traditional risk factors like dyslipidemia, hypertension ^[4]. Left ventricular hypertrophy (LVH) determined either by standard 12-lead electrocardiography (ECG) or echocardiography is also a marker of subclinical organ damage related to hypertension and an independent predictor of cardiovascular morbidity/mortality. Hypertension affects the heart by increasing after load resulting in the left ventricular hypertrophy (LVH) and stiffening of the left ventricle leading ultimately to increase in the left ventricular mass (LVM). LVH is the most common abnormality in patients with hypertension and significant marker of subclinical cardiovascular disease ^[5].

Screening of all recently diagnosed patients of essential hypertension for microalbuminuria may be a reasonable strategy to predict the presence of ongoing vascular damage, cardiac geometric adaptation, and the future risk for cardiovascular events ^[6]. The present study was conducted to record prevalence of Microalbuminuria in patients with essential hypertension.

Materials & Methods

The present study was conducted in the department of general medicine. It comprised of 102 patients of diagnosed essential hypertension of both genders. The study was approved from ethical committee. All patients were informed and their consent was obtained.

Demographic profile of the patients was recorded. Patients satisfying inclusion and exclusion criteria were subjected to detailed history and physical examination with special emphasis on the examination of cardiovascular system.

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Microalbuminuria was measured in all patients in a 24h urinary sample. Others investigations are blood urea and serum creatinine, plasma glucose – fasting and postprandial, serum electrolytes–sodium and potassium, serum uric acid, serum calcium and phosphate, lipid profile, x-ray chest and electrocardiography. Results thus obtained were statistically analyzed.

Results

Table I: Distribution of patients

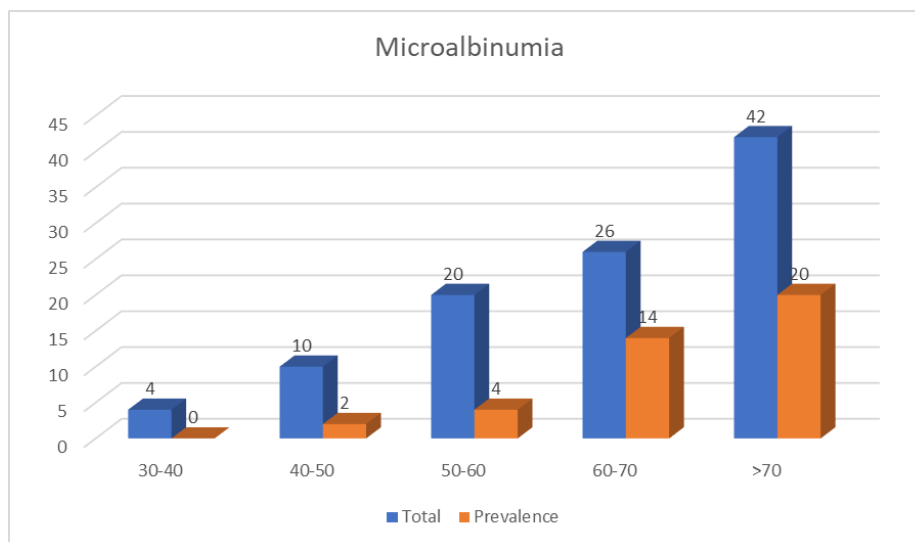
Total- 102		
Gender	Male	Female
Number	62	40

Table I shows that out of 102 patients, males were 62 and females were 40.

Table II: Prevalence of microalbuminuria based on age groups

Age groups (Years)	Total	Prevalence
30-40	4	0
40-50	10	2
50-60	20	4
60-70	26	14
>70	42	20

Table II, graph I shows that out of 102 patients, microalbuminuria was present in 40 patients. Maximum cases were seen in age group >70 years (20) followed by 6-70 years (14), 50-60 years (4) and 40-50 years (2).



Graph I: Prevalence of microalbuminuria based on age groups

Discussion

Hypertension is one of the major public health problems. Worldwide prevalence of hypertension is as much as 1 billion while 7.1 million deaths may be attributable to hypertension [7]. The JNC 7 report states that high blood pressure is the number one attributable risk for death in the world. Uncontrolled hypertension is directly associated with end organ damages including CHD, CHF, LVH, stroke, and peripheral vascular disease. Limited evidence is available among Indian patients regarding significance of microalbuminuria (MA) in context of hypertension and future cardiovascular morbidity [8]. The present study was conducted to record prevalence of Microalbuminuria in patients with essential hypertension.

In present study out of 102 patients, males were 62 and females were 40. Maggon *et al.* [9]. determined the prevalence of MA in hypertensive patients and to examine its correlation with severity of hypertension, left ventricular hypertrophy (LVH), and common carotid intima-media thickness (CCIMT). This study demonstrates the presence of MA in a significant number of newly detected and untreated patients of essential hypertension. Further, MA had a statistically significant relationship with LVH and CCIMT. Thus, screening of all recently diagnosed patients of essential hypertension for MA may be a reasonable strategy to predict the presence of future cardiovascular risk. We found that out of 102 patients, microalbuminuria was present in 40 patients. Maximum cases were seen in age

group >70 years (20) followed by 6-70 years (14), 50-60 years (4) and 40-50 years (2). Nabbaale *et al.* [10]. determined the prevalence of microalbuminuria, LVH in patients with microalbuminuria and the correlation between microalbuminuria and LVH among newly diagnosed black adult hypertensive patients attending a large outpatient hypertension. The mean age/standard deviation of the study participants was 54.3 ± 6.2 years with a female predominance (162, 63.3%). The prevalence of microalbuminuria among newly diagnosed hypertensive patients was 39.5%. The prevalence of LVH among patients with microalbuminuria was found to be 17%. There was a positive correlation between microalbuminuria and left ventricular hypertrophy among the newly diagnosed adult hypertensive patients. This study demonstrates that microalbuminuria is highly prevalent among newly diagnosed black hypertensive patients and in the presence of LVH. There is also a positive correlation between microalbuminuria and LVH among newly diagnosed hypertensive patients. Since it is a less costly and readily available test, it can be used to predict presence of LVH especially in resource limited settings where ECHO services are not readily available.

Hypertension doubles the risk for symptomatic CAD, including acute myocardial infarction and sudden death and more than triples the risk for CHF. Hypertension places increased tension on the left ventricular myocardium that is manifested as stiffness and hypertrophy, which accelerates

the development of atherosclerosis within coronary vessels [11].

The combination of increased demand and lessened supply increases the likelihood of myocardial ischemia and thereby leading to a higher incidence of myocardial infarction, sudden death, arrhythmias, and congestive failure in hypertensive patients. Endothelial dysfunction and chronic inflammation have been suggested as possible causes to explain the association between MA and cardiovascular disease. Microalbuminuria is an early manifestation of kidney damage and independently predicts cardiovascular disease (CVD). Left ventricular hypertrophy (LVH) is also an early marker of cardiac manifestation of target organ damage among hypertensive patients [12].

Conclusion

Authors found the presence of microalbuminuria in a significant number of newly detected and untreated patients of essential hypertension.

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