ejpmr, 2017,4(4), 626-629

SJIF Impact Factor 4.161

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

PREVALENCE OF MICROALBUMINURIA IN NON-DIABETIC HYPERTENSIVE PATIENTS AND ITS ASSOCIATION WITH LEFT VENTRICULAR HYPERTROPHY IN A TERTIARY CARE HOSPITAL

Dr. Mohan Kashinkunti[1] and Dr. Aneesh T.*[2]

[1]Professor, Department of Medicine, S D M College of Medical Sciences and Hospital, Dharwad.
[2]Assistant Professor, Department of Medicine, S D M College of Medical Sciences and Hospital, Dharwad.

***Corresponding Author: Dr. Aneesh T.**
Assistant Professor, Department of Medicine, S D M College of Medical Sciences and Hospital, Dharwad.

Article Received on 17/02/2017 **Article Revised on 07/03/2017** **Article Accepted on 28/03/2017**

ABSTRACT

Introduction: - Essential hypertension is one of the commonest medical problems in the general population and is one of the most important modifiable cardiovascular risk factors. Left ventricular hypertrophy also has a prognostic value in patients with Hypertension that strongly correlates with adverse cardiovascular outcome. Microalbuminuria is a state of increased vascular permeability particularly in the kidney. It is an easily measured marker of endothelial dysfunction and low grade inflammation. This study was designed to determine whether an association exists between urine microalbumin and left ventricular hypertrophy in non-diabetic hypertensive patients. **Aim**: - To study the prevalence of microalbuminuria in non-diabetic hypertensive patients and determine the relationship between microalbuminuria and left ventricular hypertrophy. **Methods:** - 120 non-diabetic, hypertensive patients aged more than 30 years who attended General Medicine outpatient clinic and who were admitted during the study period were enrolled in this prospective study. **Results:** - The mean age of the study population was 55.15±10.17 years, with most patients aged between 51-60 years. 55% of the patients showed evidence of left ventricular hypertrophy, among these patients 85.67% of them had microalbuminuria. In this study, majority of the patients (60%) had stage 2 hypertension, as the severity of hypertension at presentation increased, prevalence of microalbuminuria also increased and this correlation was statistically significant. **Conclusion:** - This study demonstrates a high prevalence of microalbuminuria and Left ventricular hypertrophy which are independent predictors of cardiovascular morbidity and mortality in patients with essential hypertension. Screening for urine albumin excretion should be extensively adopted in clinical care as it is a relatively simple, readily available and cost effective test especially in resource limited settings where ECHO services are not readily available.

KEY WORDS: Hypertension, Left ventricular hypertrophy, microalbuminuria, cardiovascular disease.

I. INTRODUCTION

Hypertension is one of the leading cause of global burden of disease and is an important public health issue. According to the WHO report in 2002, hypertension is identified as the 3rd important risk factor for disability adjusted life years (DALY). Cardiovascular disease will be the leading cause of death and disability by 2020 in India.[1]

Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India.[2] 20.6% of Indian men and 20.9% of Indian women were suffering from Hypertension in 2005. The rates for Hypertension in percentages are projected to go up to 22.9 and 23.6 for Indian men and women, respectively by 2025.[3]

WHO 2011 NCD India specific data portray a grim picture for the 17.8% of the world's population who reside in India[4]. The regional variations (between urban and rural) reported in prevalence of HTN are also seen in cardiovascular diseases. Published literature reports regional variations in mortality and prevalence of CHD and stroke in India (south India has higher CHD mortality and eastern India has higher stroke rates). Similar variations are also seen among urban and rural areas with CHD prevalence being higher in urban parts of India.[5]

Microalbuminuria is a state of increased vascular permeability particularly in the kidney. It is an easily measured marker of endothelial dysfunction and low grade inflammation.[6] Microalbuminuria has been traditionally defined as a urinary albumin excretion rate between 30 mg/24 hours and 300 mg/24 hours or a urine albumin creatinine ratio between 30 mg/g & 300 mg/g in an early morning sample. It is pertinent to note that these cut-off values have been primarily defined for

proteinuria in diabetic individuals, and are yet to be rigorously validated in non-diabetic individuals.[7] Exaggerated morbidity and mortality heralded by greater amounts of urine albumin was reported several decades ago, a phenomenon still elusive in its determinants despite the growing number of publications. An interesting hypothesis postulates that more albumin leaks through glomeruli which are made more permeant by the same endothelial pathology that promotes and/or accelerates the atherogenic process.[8]

This study was designed to determine whether an association exists between urine microalbumin and target organ damage such as left ventricular hypertrophy and retinopathy in non-diabetic hypertensive patients.

Aims and objectives

1. To study the prevalence of microalbuminuria in non-diabetic hypertensive patients
2. To study the relationship between microalbuminuria and left ventricular hypertrophy

II. MATERIALS AND METHODS

A total of 120 non-diabetic, hypertensive patients who were attending general medicine outpatient clinic and who were admitted in SDM Hospital during the period June 2016 to January 2017 were studied considering the inclusion and exclusion criteria.

Methods of collecting data

A Structured preformat was prepared and patients satisfying the inclusion criteria were enrolled in the study after taking informed written consent. Detailed history with duration of disease, treatment & co-morbidities were recorded. Through general and systemic examination was done for each patient. Urine microalbumin, 12- lead electrocardiogram, 2D-Echocardiography, random blood sugar, urine routine were done for the patients included in the study

Inclusion criteria: Essential hypertension patients aged > 30 years

Exclusion criteria:

1. Type 2 Diabetes Mellitus
2. Acute febrile illness
3. Patients on ACE inhibitors and ARBs
4. Urinary tract infection
5. Chronic renal disease
6. Ischemic heart disease
7. Patients on long term diuretics
8. Bed ridden patients

Statistical methods

Statistical analysis was done using SPSS software and chi square test. The results of the qualitative analysis were expressed as mean and standard deviation. Chi square test was used for qualitative values and tests of significance. The results were considered 'very significant' with P value <0.01 and 'significant' with P value <0.04

III. RESULTS

65% of the study population were men. The mean age of the study population was 55.15±10.17 years, with most patients aged between 51-60 years (Figure 1). 69% of the patients had microalbuminuria (Figure 2). 55% of the patients showed evidence of left ventricular hypertrophy, among these patients 85.67% of them had microalbuminuria (Figure 3). Patients with duration of hypertension >15 years had higher prevalence of microalbuminuria (Table 1). In our study, majority of the patients (60%) had grade 2 hypertension, as the severity of hypertension at presentation increased, prevalence of microalbuminuria also increased and this correlation was statistically significant (Table 2).

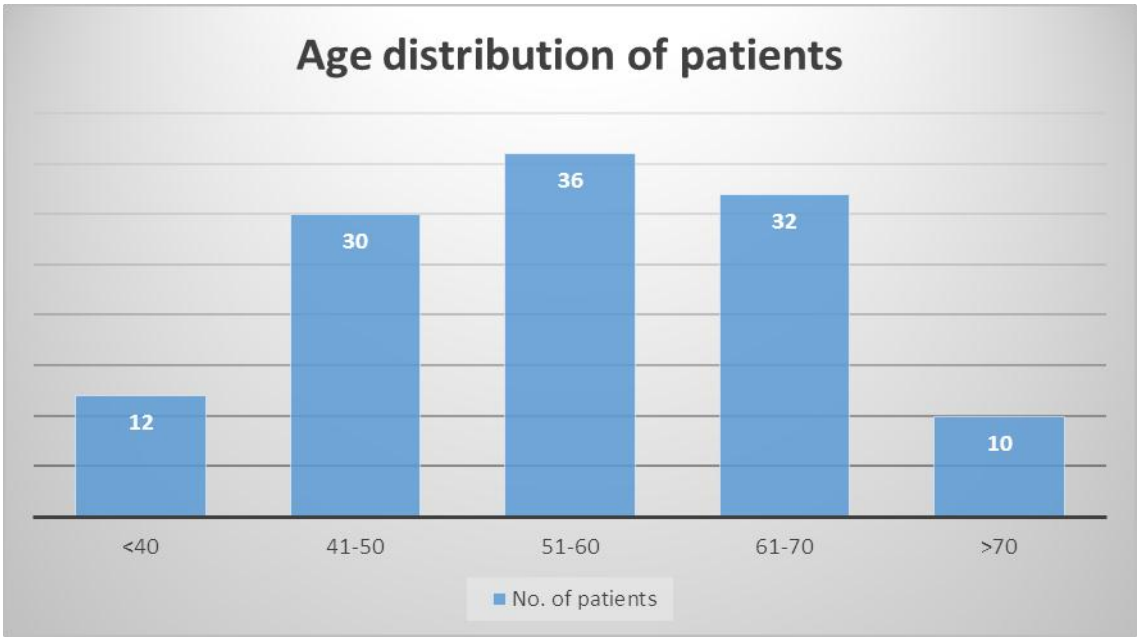

Figure 1: Age distribution of patients

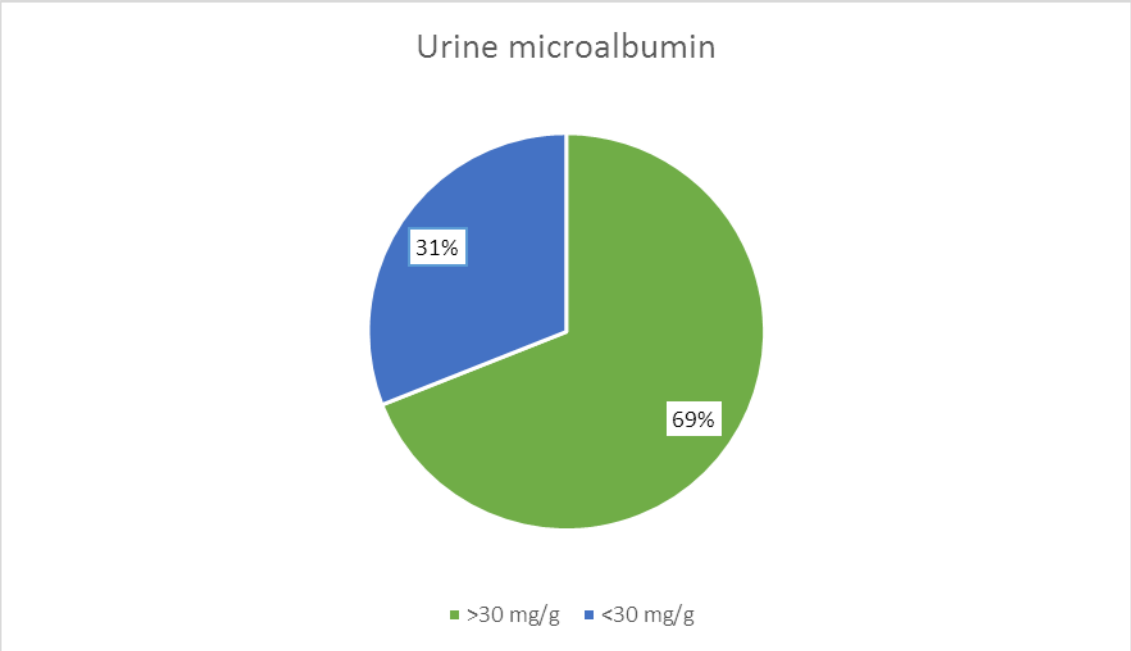

Figure 2: Prevalence of microalbuminuria

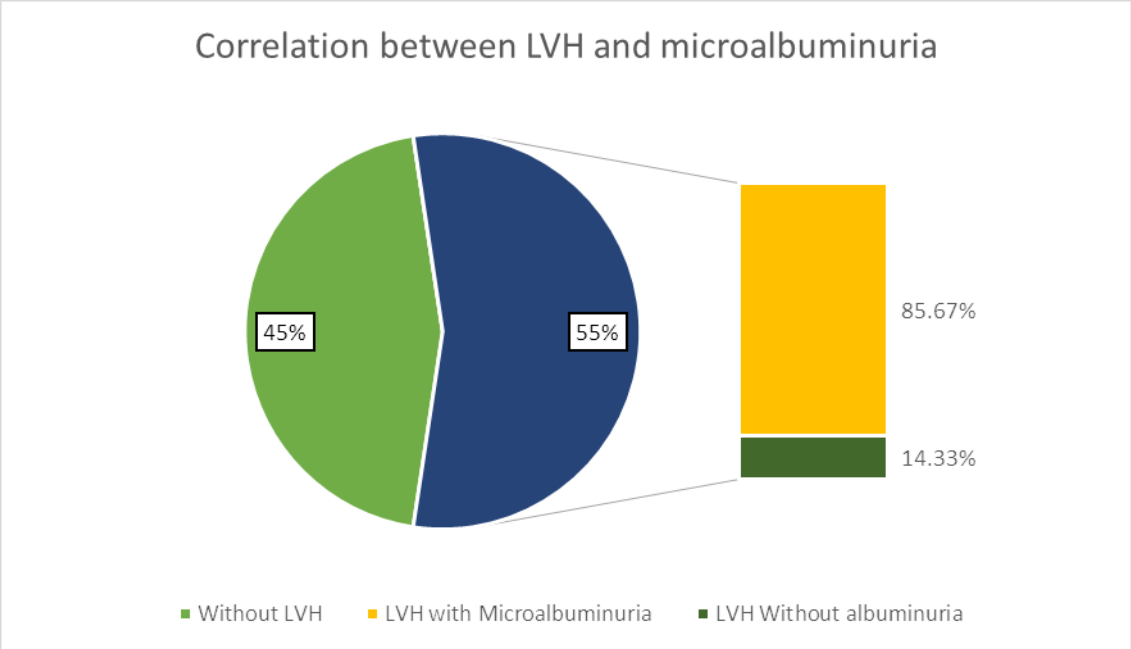

Figure 3: Correlation between LVH and microalbuminuria

Table 1: Correlation of albumin excretion with duration of hypertension

Duration Of Hypertension	Microalbuminuria (30-300 mg/g)	Normoalbuminuria (<30 mg/g)	Percentage of patients with microalbuminuria
<15 years	17	30	**36.17%**
>15 years	59	14	**80.82%**

Table 2: Relationship between severity of hypertension and microalbuminuria

Severity of hypertension	Microalbuminuria positive	Microalbuminuria negative	Total
Stage 1	20	18	38
Stage 2	52	20	72
Stage 3	8	2	10
Total	80	40	120

IV. DISCUSSION

In this study we have demonstrated that microalbuminuria levels were higher in patients with LVH compared to patients without LVH. The association suggests the role of microalbuminuria as an early marker of increased cardiovascular risk and subclinical organ damage. This may help to explain the high incidence of target organ damage in hypertensive patients with increased urinary albumin excretion.

A study conducted by Tsioufis et. al. showed patients with microalbuminuria had significantly greater left ventricular internal dimension (by 21 g/m^2) and relative wall thickness (by 0.05 cm) compared to patients without microalbuminuria ($P < .001$).[9] Wachtell and associates found microalbuminuria in 1844 of 8029 patients (23%) with stage 2-3 hypertension.[10] However, in our study, the prevalence of microalbuminuria was much higher, with 73.2% of stage 2-3 hypertensive patients showing microalbuminuria. The reported prevalence of microalbuminuria in our study is comparable to what has been reported in a large international multi-center trial.[11] With advancing stages of hypertension, it has been illustrated that both microalbuminuria and LV mass increase with worsening BP levels. LVH as a marker of target organ damage and a well-known predictor of cardiovascular events has an independent association with a pro inflammatory state, and in particular elevated fibrinogen levels, which is associated with development of atherosclerosis, indicating the presence of albumin in the urine as a major risk factor for the development of target organ damage.[12]

V. CONCLUSION

This study demonstrates a high prevalence of microalbuminuria and LVH which are considered to be independent predictors of cardiovascular morbidity and mortality in patients with essential hypertension. Screening for urine albumin excretion should be extensively adopted in clinical care as it is a relatively simple, readily available and cost effective test which facilitates early cardiovascular disease detection as a strategy of averting hypertension related complications like LVH and its optimal management.

REFERENCES

1. Arun Chockalingam, Norman R Cambell and J George Fodor et. al. The World Hypertension League and International Society of Hypertension Call on Governments, Nongovernmental Organizations, and the Food Industry to Work to Reduce Dietary Sodium, Can J Cardiol. 2006; May 22(7): 553-555.
2. Gupta R et. al, Trends in hypertension epidemiology in India. J Hum Hypertens. 2004 Feb; 18(2): 73-8.
3. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J, Global burden of hypertension: analysis of worldwide data. Lancet. 2005 Jan 15-21; 365(9455): 217-23.
4. Non communicable diseases country profiles 2011. http://www.who.int/nmh/countries/ind_en.pdf
5. Gupta R, Guptha S, Sharma KK, Gupta A, Deedwania P, Regional variations in cardiovascular risk factors in India: India heart watch. World J Cardiol. 2012 Apr 26; 4(4): 112-20.
6. Wachtell K, Ibsen H, Olsen M H, Albuminuria and cardiovascular risk in hypertensive patients with left ventricular hypertrophy: the LIFE study, Ann Intern Med. 2003 Dec 2; 139(11): 901-6.
7. Sowjanya Naha, Kushal Naha, Vinay R. Pandit, and R. Balasubramanian, Association of microalbuminuria with ischemic heart disease in non-diabetic Asian-Indians: A case control study; Avicenna J Med. 2015 Jan-Mar; 5(1): 6–10.
8. Roberto Pedrinellia, Giulia Dell'Omoa, Giuseppe Pennob, Mario Mariania, Non-diabetic microalbuminuria, endothelial dysfunction and cardiovascular disease; Vascular Medicine 2001; 6: 257–264
9. Tsioufis C, Stefanadis C, Toutouza M, et al. Microalbuminuria is associated with unfavourable cardiac geometric adaptations in essential hypertensive subjects. Journal of Human Hypertension. 2002; 16: 249-4.
10. Wachtell K, Palmieri V, Olsen MH, et al. Urine albumin/ creatinine ratio and echocardiographic left ventricular structure and function in hypertensive patients with electrocardiographic left ventricular hypertrophy: The LIFE study. Am Heart J. 2002; 143: 319-26.
11. Böhm M, Thoenes M, Danchin N, Reil J, Volpe M. Overview of the i-SEARCH Global Study: cardiovascular risk factors and microalbuminuria in hypertensive individuals. High Blood Press Cardiovasc Prev. 2008; 15(4): 217–24.
12. Palmieri V, Celentano A, Roman J, de-Simone G, Lewis M, Best L, et al. Fibrinogen and preclinical echocardiographic target organ damage: the Strong Heart Study. Hypertension. 2001; 38: 1068–74.