

# Microalbuminuria in Patients with Essential Hypertension

Salma Kadir, Musarat Jehan Baloch and Nazir Ahmed Memon

## ABSTRACT

**Objective:** To determine the microalbuminuria in patients with essential hypertension.

**Study Design:** Cross-sectional multidisciplinary study.

**Place and Duration of Study:** This study was conducted at the Tertiary Care Hospitals and the data was also gained from private clinics for six months during 2018-2019.

**Materials and Methods:** All the patients of 30-70 years of age and either gender, having hypertension (systolic blood pressure -SBP  $\geq 140$  mmHg and/ or diastolic blood pressure - DBP of  $\geq 90$  mmHg) were recruited and enrolled in the study. Blood pressure was measured two times at 5 minutes interval while the mean arterial pressure (MAP) was also calculated. The urinary examination was done among relevant individuals for microalbuminuria by collection of urine specimen and the micro albumin: creatinine ratio  $< 30$ mg/g considered as normal buminuric while between 30-300mg/g was microalbuminuria whereas the frequency / percentages (%) and means  $\pm$ SD computed for study variables.

**Results:** During 6 month study period total 120 patients were explored and study. The mean  $\pm$  SD for age (years) of population was  $52.31 \pm 6.62$ . Regarding gender, male 78 (65%) and 42 females (35%), residence as urban 48 (40%) and rural 72 (60%), family history of hypertension 53 (44.2%), diabetes mellitus 84 (70%), obesity 55 (45.8%) and microalbuminuria 79 (65.8%).

**Conclusion:** The presence of microalbuminuria in hypertensive individuals shows positive association and should be considered as timely screening tool for microalbuminuria in patients with essential hypertension.

**Key Words:** Hypertension, microalbuminuria and proteinuria.

**Citation of article:** Kadir S, Baloch MJ, Memon NA. Microalbuminuria in Patients with Essential Hypertension. Med Forum 2020;31(9):2-4.

## INTRODUCTION

Hypertension is a disorder that affect majority individuals worldwide and raises the risk for the development of cardiac, cerebral and kidney complications.<sup>1</sup>The majority of individuals have essential hypertension which is defined as increase in blood pressure (BP) of unknown cause despite the widely identified crises related to uncontrolled blood pressure, the disease remains inadequately treated in most individuals mainly due to its asymptomatic appearance even when it progressively involves multiple systems of the body.<sup>2,3</sup>

The term microalbuminuria is defined as urinary albumin excretion (UAE) rate higher than normal, the lowest detection limit of proteinuria as estimated by standard laboratory procedure in the absence of urinary tract infection and illness including acute myocardial

infarction.<sup>4,5</sup> Detection of UAE in the early morning urine sample comprises as an ideal test for screening and overnight urine collection might be the best choice for monitoring urinary albumin.<sup>6</sup>

The hypertension and microalbuminuria commonly associated while the mechanism is controversial but is thought to be a kidney manifestation of generalized vascular endothelial dysfunction and strongly related with increased cardiovascular risk.<sup>7</sup>It is well known that both that coexisting hypertension exacerbates and impair renal function and somehow results in a markedly increased risk of uncontrolled hypertension.<sup>8</sup> It has been recommended that patients with hypertension should be tested for albuminuria at the time of initial diagnosis and yearly thereafter because screening for the earliest stages of renal damage and controlling hypertension can help preventing more severe kidney disease, so the blood pressure monitoring and control is important especially after the onset of kidney impairment.<sup>9</sup> Thus, the present study was conducted to see the correlation between microalbuminuria and hypertension in essential hypertension because early identification and management can save the patient to acquire life threatening complications associated with hypertension.

## MATERIALS AND METHODS

Six months' hospital based cross-sectional multidisciplinary study (2018-2019) was conducted at

---

Liaquat University of Medical and Health Sciences (LUMHS) Jamshoro.

---

Correspondence: Dr. Nazir Ahmed Memon, Liaquat University of Medical and Health Sciences (LUMHS) Jamshoro.

Contact No: 0300-8440415

Email: namccu@hotmail.com

---

Received: May, 2020

Accepted: July, 2020

Printed: September, 2020

---

tertiary care hospitals and the data was also gained from private clinics. All the patients of 30-70 years of age and either gender, having hypertension (systolic blood pressure -SBP  $\geq 140$  mmHg and/ or diastolic blood pressure - DBP of  $\geq 90$  mmHg) were recruited and enrolled in the study. Blood pressure was measured two times at 5 minutes interval while the mean arterial pressure (MAP) was also calculated whereas the known cases of chronic kidney diseases, urinary tract infection, liver cirrhosis, already on hemodialysis and the patients having malignancy and already on immunosuppressive therapy and the pregnant and lactating ladies were considered in exclusion criteria. The urinary examination was done among relevant individuals for microalbuminuria by collection of urine specimen and the micro albumin: creatinine ratio  $< 30$ mg/g considered as normal buminuric while between 30-300mg/g was microalbuminuria. The data was collected on pre-designed proforma and analyzed in SPSS to calculate the frequencies and percentages.

## RESULTS

**Table No.1: The Demographical and Clinical Profile of Study Population**

Parameter	Frequency (N=120)	age (%)
<b>Age (yrs)</b>		
30-39	17	14
40-49	25	20
50-59	32	28.3
60-70	26	21.7
70+	20	18
<b>Gender</b>		
Male	78	65
Female	42	35
<b>Residence</b>		
Urban	48	40
Rural	72	60
<b>Family History Of Hypertension</b>		
Yes	53	44.2
No	67	55.8
<b>Diabetes Mellitus</b>		
Yes	84	70
No	36	30
<b>Obesity</b>		
Yes	55	45.8
No	65	54.2
<b>Microalbuminuria</b>		
Yes	79	65.8
No	41	34.2
<b>Mean <math>\pm</math> SD</b>		
SBP	155.72 $\pm$ 8.65	
DBP	99.61 $\pm$ 5.72	
HBA1C	8.84 $\pm$ 2.86	
BMI	31.25 $\pm$ 2.43	

During one-year study period total fifty patients were explored and study. The mean  $\pm$  SD for age (years) of population was 52.31 $\pm$ 6.62. The demographical and clinical profile of study population is presented. Table 1.

## DISCUSSION

The high prevalence of microvascular complications of hypertension means that the number of individuals with end stage renal disease due to hypertension will also increase dramatically.<sup>10</sup> The risk factors related to microalbuminuria were hypertension and poor glycemic control and is now widely appreciated that the excretion of even small amounts of protein in urine may leads to life threatening future complications such as cardiovascular and cerebrovascular disorders and progression in renal dysfunction.<sup>11,12</sup>

The literature has been shown the association between microalbuminuria and high levels of blood pressure and Ahmedani MY, et al reported that microalbuminuric patients have higher systolic and diastolic blood pressure which has been also endorsed by other authors.<sup>13</sup> Similarly Afkhami-Ardehani M, et al and Varghese A, et al also reported correlation between the microalbuminuria and the high blood pressure.<sup>14,15</sup> Svensson M, et al identified high blood pressure increases the risk of acquiring nephropathy.<sup>16</sup> Our study also observed the significant correlation between hypertension and microalbuminuria and the majority individuals have uncontrolled diabetes mellitus.

Thus, the hypertension is probably both a cause and presentation of diabetic nephropathy. The former literature has observed that detecting and monitoring of patients with hypertension is necessary because its timely treatment can prevent nephropathy.<sup>17</sup> The microalbuminuria in hypertensive individuals suggests that high blood pressure is associated with proteinuria.<sup>18</sup> Hence, high prevalence of microalbuminuria in patients with essential hypertension must alert the clinicians regarding the occurrence of sub-clinical chronic kidney disease in our population and the preventive strategies for reduction of the burden of chronic kidney disease should be designed by early identification and timely management of hypertension.

## CONCLUSION

The existence of microalbuminuria in hypertensive individuals shows positive association and should be considered a timely screening tool for microalbuminuria is essential for proper treatment and prevention of future cardiovascular or cerebrovascular events by control of hypertension.

### Author's Contribution:

Concept & Design of Study: Salma Kadir  
 Drafting: Musarat Jehan Baloch  
 Data Analysis: Nazir Ahmed Memon  
 Revisiting Critically: Salma Kadir, Musarat

Jehan Baloch  
Final Approval of version: Salma Kadir

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

## REFERENCES

1. Leung AA, Daskalopoulou SS, Dasgupta K, McBrien K, Butalia S, Zarnke KB, et al. Hypertension Canada's 2017 guidelines for diagnosis, risk assessment, prevention, and treatment of hypertension in adults. *Canadian J Cardiol* 2017;33(5):557-76.
2. De Boer IH, Bangalore S, Benetos A, Davis AM, Michos ED, Muntner P, et al. Diabetes and hypertension: a position statement by the American Diabetes Association. *Diabetes Care* 2017; 40(9):1273-84.
3. Wang Z, Chen Z, Zhang L, Wang X, Hao G, Zhang Z, et al. Status of hypertension in China: results from the China hypertension survey, 2012–2015. *Circulation* 2018;137(22):2344-56.
4. Aloni MN, Mabidi JL, Ngiyulu RM. Prevalence and determinants of microalbuminuria in children suffering from sickle cell anemia in steady state. *Clin Kidney J* 2017;10(4):479-486.
5. Cho H, Kim JH. Prevalence of microalbuminuria and its associated cardiometabolic risk factors in Korean youth: Data from the Korea National Health and Nutrition Examination Survey. *PLoS One* 2017;12(6):e0178716.
6. Efundem NT, Assob JCN, Fetei VF, Choukem SP. Prevalence and associations of microalbuminuria in proteinuria-negative patients with type 2 diabetes in two regional hospitals in Cameroon: a cross-sectional study. *BMC Res Notes* 2017;10(1):477.
7. Chen F, Yang W, Weng J. Albuminuria: Prevalence, associated risk factors and relationship with cardiovascular disease. *J Diabetes Investig* 2014;5(4):464-471.
8. Bakris GL, Molitch M. Microalbuminuria as a risk predictor in diabetes: the continuing saga. *Diabetes Care* 2014;37(3):867-875.
9. Tenekecioglu E, Yilmaz M, Yontar OC. Microalbuminuria in untreated prehypertension and hypertension without diabetes. *Int J Clin Exp Med* 2014;7(10):3420-3429.
10. Murai S, Tanaka S, Dohi Y, Kimura G, Ohte N. The prevalence, characteristics, and clinical significance of abnormal albuminuria in patients with hypertension. *Sci Rep* 2014;4:3884.
11. Currie G, Delles C. Proteinuria and its relation to cardiovascular disease. *Int J Nephrol Renovasc Dis* 2013;7:13-24.
12. Pasko N, Toti F, Strakosha A. Prevalence of microalbuminuria and risk factor analysis in type 2 diabetes patients in Albania: the need for accurate and early diagnosis of diabetic nephropathy. *Hippokratia* 2013;17(4):337-341.
13. Ahmadani MY, Fawaad A, Basit A, Hydrie ZI. Microalbuminuria prevalence study in hypertensive patients with type 2 diabetes in Pakistan. *J Ayub Med Coll Abbottabad* 2008;20(3):17-20
14. Afkhami-Ardehani M, Modarresi M, Amirchaghmaghi E. Prevalence of microalbuminuria and its risk factors in type 2 diabetic patients. *Int J Neph* 2008;18(3):112-117.
15. Varghese A, Deepa R, Rema M, Mohan V. Prevalence of microalbuminuria in type 2 DM at a diabetes center in southern India. *Post Grad Med J* 2001;77(908):399-402.
16. Svensson M, Sundkvist G, Arnqvist HJ. Signs of nephropathy may occur early in young adults with diabetes despite modern diabetes management. Results from the nationwide population based Diabetes incidence study in Sweden. *Diabetes Care* 2003;26:2903-2909.
17. Mani A. Albuminuria in Hypertensive Patients: Where the Choice of Antihypertensive Medications Matters: Commentary on "Several Conventional Risk Markers Suggesting Presence of Albuminuria Are Weak Among Rural Africans with Hypertension. *J Clin Hypertens (Greenwich)* 2016;18(1):31-32.
18. Viazzi F, Cappadona F, Pontremoli R. Microalbuminuria in primary hypertension: a guide to optimal patient management? *J Nephrol* 2016; 29(6):747-753.