



CODEN [USA]: IAJ PBB

ISSN: 2349-7750

## INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

<http://doi.org/10.5281/zenodo.1137620>

Available online at: <http://www.iajps.com>

Research Article

### MICROALBUMINURIA IN PATIENTS WITH ESSENTIAL HYPERTENSION

Dr. Mohammad Zaman Baloch <sup>1\*</sup>, Dr. Abdul Haque Khan <sup>2</sup>, Dr. Abdul Ghani Rahimoon <sup>2</sup>,  
Dr. Sidra Ali <sup>3</sup>, Dr. Hamid Nawaz Ali Memon <sup>4</sup>, Dr. Samreen <sup>5</sup> and Dr. Zulfiqar Ali Qutrio  
Baloch <sup>6</sup>

<sup>1</sup>Indus Medical College, Tando Muhammad Khan, Sindh Pakistan

<sup>2</sup>Department of Medicine, Liaquat University of Medical and Health Sciences (LUMHS) Jamshoro Sindh  
Pakistan.

<sup>3</sup>Dow University of Health Sciences (DUHS), Karachi

<sup>4</sup>Zulekha Hospital Dubai United Arab Emirates.

<sup>5</sup>National Institute of Cardiovascular Diseases [NICVD] Karachi.

<sup>6</sup>Brandon Regional Hospital Brandon, Florida, U.S.A

**Abstract:**

***Objective:** To determine the frequency of microalbuminuria in patients with essential hypertension at tertiary care hospital*

***Patients and Methods:** The patients with essential hypertension of either gender were recruited and enrolled in this six month cross sectional study after taking informed consent. The essential hypertension was diagnosed and severity of hypertension has been classified as per Joint National Committee (JNC) VII report on prevention detection, evaluation and treatment of high blood pressure. For microalbuminuria the 24 hours urine for microalbuminuria estimation was done and 30 to 300 mg in 24-h urine was considered as microalbuminuria. The data saved on pre-designed proforma and analyzed in SPSS 16 while the mean  $\pm$ SD, frequencies and percentages was calculated.*

***Results:** out of 50 essential hypertensive cases (33 males and 17 females) were explored for microalbuminuria, of which 15 were found to have normoalbuminuria and 35 cases found to have microalbuminuria. The mean duration of essential hypertension in overall population was  $9.65 \pm 4.85$  years. The mean duration of hypertension in microalbuminuric cases was  $8.97 \pm 6.65$  year as compared to normoalbuminuric ( $3.65 \pm 2.86$  years). The mean systolic blood pressure in overall population was  $160 \pm 10.96$  mmHg. The mean systolic blood pressure with microalbuminuria was  $165.94 \pm 10.51$  mm Hg as compared to normoalbuminuria ( $140.98 \pm 6.85$  mm Hg). The mean diastolic blood pressure in overall population was  $100 \pm 5.89$  mmHg. The mean diastolic blood pressure with microalbuminuria was  $90.97 \pm 8.95$  mmHg as compared to normoalbuminuria ( $80.52 \pm 4.95$  mm Hg). The microalbuminuria was detected in 35 (70%) patients (23 males and 12 females).*

***Conclusion:** The prevalence of microalbuminuria in essential hypertension was found to be 70% and is a risk factor for target organ damage and has positive correlation with severity and duration of hypertension.*

***Keywords:** Essential hypertension, Microalbuminuria and Proteinuria*

**Corresponding author:**

**\* Dr. Mohammad Zaman Baloch,**  
Indus Medical College,  
Tando Muhammad Khan,  
Sindh Pakistan.  
Email: [zulfiqar229@hotmail.com](mailto:zulfiqar229@hotmail.com)

QR code



Please cite this article in press as Mohammad Zaman Baloch et al., *Microalbuminuria in Patients with Essential Hypertension*, *Indo Am. J. P. Sci*, 2017; 4(12).

**INTRODUCTION:**

The hypertension is the most common public health issue worldwide and became life threatening if left untreated [1, 2]. The careful monitoring and treatment can reduce the mortality rate and various cardiovascular and cerebrovascular complications [3, 4]. The treatment negligence, ignorance and non compliance can leads to acute myocardial infarction, cerebrovascular accidents, chronic renal failure and retinopathy [5]. Microalbuminuria observed as emerging problem and results in vascular damage in patients with essential hypertension [6]. Along with Hypertension it increases the risk of cardiovascular and cerebrovascular disease and also leads to chronic renal failure when compared to the individuals with normal urinary albumin level [7]. It is an important marker for target organ damage in essential hypertension and former studies have shown increase prevalence of microalbuminuria in hypertension [8]. The severity and duration of hypertension is directly proportional to microalbuminuria and leads to glomerular damage through proteinuria [9]. Thus, this study was conducted to evaluate the relationship between hypertension and microalbuminuria so that early and appropriate measures can be taken to reduce the risk of chronic renal failure.

**PATIENTS AND METHODS:**

The patients with essential hypertension of either gender were recruited and enrolled in this six month cross sectional study after taking informed consent. The essential hypertension was diagnosed and severity of hypertension has been classified as per Joint National Committee (JNC) VII report on prevention detection, evaluation and treatment of high blood pressure.  $\geq 2$  reading with 2 minutes interval were averaged while in newly identified

hypertensive individuals, the diagnosis was done based on the average of  $\geq 2$  readings taken at each of  $\geq 2$  visits after an initial screening while the patients with secondary hypertension and pregnancy induced hypertension were excluded from the study. All subjects were investigated in detail including history of signs and symptoms, duration of hypertension, previous blood pressure readings, complete urine analysis, blood sugar level and fasting lipid profile while for microalbuminuria the 24 hours urine for microalbuminuria estimation was done and 30 to 300 mg in 24-h urine was considered as microalbuminuria. The data was collected on proforma while SPSS 16 was used to analyze the data.

**RESULTS:**

In the present study, out of 50 essential hypertensive cases (33 males and 17 females) were explored for microalbuminuria, of which 15 were found to have normoalbuminuria and 35 cases found to have microalbuminuria. The mean duration of essential hypertension in overall population was  $9.65 \pm 4.85$  years. The mean duration of hypertension in microalbuminuric cases was  $8.97 \pm 6.65$  year while in normoalbuminuric population it was  $3.65 \pm 2.86$  years. The mean systolic blood pressure in overall population was  $160 \pm 10.96$  mmHg. The mean systolic blood pressure with microalbuminuria was  $165.94 \pm 10.51$  mm Hg while in normoalbuminuric population it was  $140.98 \pm 6.85$  mm Hg. The mean diastolic blood pressure in overall population was  $100 \pm 5.89$  mmHg. The mean diastolic blood pressure with microalbuminuria was  $90.97 \pm 8.95$  mmHg while in normoalbuminuric individuals it was  $80.52 \pm 4.95$  mm Hg. The results are presented in Table 1 and 2

**Table 1: The Characteristics of the Study Population**

PARAMETERS	Mean $\pm$ SD
Age (Years)	$52.96 \pm 8.95$
Duration of essential hypertension (Years)	$9.65 \pm 4.85$
Systolic blood pressure (mm Hg)	$160 \pm 10.96$
Diastolic blood pressure (mm Hg)	$100 \pm 5.89$

**Table 2: The Gender Distribution in Patients With and Without Microalbuminuria**

	MICROALBUMINURIA	NORMOALBUMINURIA	Total
Male	23	10	33
Female	12	05	17
Total	35	15	50

**DISCUSSION:**

Proteinuria observed to be nephrotoxic and the risk increases if co-exist with hypertension, the exact mechanism not known and the presence of microalbuminuria needs to be carefully explored and evaluate the exact etiology and risk factors along with plan for specific and effective intervention [10-13]. Former studies observed that the risk of CVD increases in patients with microalbuminuria and with appropriate workup and effective treatment the burden of CVD and other target organ damage can be reduced and prevented [14-16]. Therefore this study was conducted systematically to determine the prevalence of microalbuminuria in individuals with essential hypertension. In present study, 35 (70%) patients of essential hypertension found to be microalbuminuric and it can be comparable with previous studies as 46%, 62.5% and 65% respectively [17-19]. The mean age  $\pm$ SD for while population is  $52.96 \pm 8.95$  years and is comparable with former studies as  $60.73 \pm 6.87$  and  $59.86 \pm 8.96$  respectively [17, 18] The male population was predominant in present studies and is consistent with the study by Poudyal N, et al [19]. In present study the mean diastolic blood pressure with and without microalbuminuria was  $90.97 \pm 8.95$  mmHg and  $80.52 \pm 4.95$  mm Hg while it is  $98.15 \pm 11.65$  mmHg and  $83.60 \pm 6.45$  mmHg in the study by Bianchi S, et al [20]. The systolic blood pressure with and without microalbuminuria is also consistent with the study by Cirillo M, et al [21].

The microalbuminuria also correlates and directly proportional to the duration of hypertension and higher prevalence found in individuals with severe hypertension 21-23].

**CONCLUSION:**

In present study the prevalence of microalbuminuria in essential hypertension was found to be 70% and is a risk factor for target organ damage and has positive correlation with severity and duration of hypertension.

**REFERENCES:**

1. Ramakrishna G, Raju VV, Chaitanya G, Indhira D. A study of microalbuminuria in essential hypertension and its correlation with the target organ damage. *Journal of Evolution of Medical and Dental Sciences*. 2015 Dec 10;4(99):16404-7.
2. Meccariello A, Buono F, Verrengia E, Orefice G, Grieco F, Romeo F, et al. Microalbuminuria predicts the recurrence of cardiovascular events in patients with essential hypertension. *Journal of hypertension*. 2016 Apr 1;34(4):646-53.
3. Li Y, Wan Z, Sun Y, Lu W, Yao W, Yu X, et al. Relationship between serum aldosterone and

microalbuminuria in patients with essential hypertension. *Int J Clin Exp Pathol*. 2016 Jan 1;9(10):10635-42.

4. Ofori SN, Odia OJ. Serum uric acid and target organ damage in essential hypertension. *Vascular health and risk management*. 2014;10:253.

5. Roopa AN, Reddy KS, Chandrasekhara P, Umabai KR. Study of microalbuminuria and insulin resistance in patients with essential hypertension and metabolic syndrome and its relationship to target organ damage. *J Med Sci Health*. 2015;1(3):5-9

6. Sindhu V, Khari S, Sharma A, Prashad K. To Study the Prevalence of Microalbuminuria among Essential Hypertensives. *International Journal of Contemporary Medicine*. 2017;5(1):72-7.

7. Mule G, Calcaterra I, Costanzo M, Geraci G, Guarino L, Foraci AC, et al. Relationship between short-term blood pressure variability and subclinical renal damage in essential hypertensive patients. *The Journal of Clinical Hypertension*. 2015 Jun 1;17(6):473-80.

8. Carpinella G, Pagano G, Buono F, Petitto M, Guarino G, Orefice G, et al. Prognostic value of combined target-organ damage in patients with essential hypertension. *American journal of hypertension*. 2014 Jun 16;28(1):127-34.

9. Viazzi F, Cappadona F, Pontremoli R. Microalbuminuria in primary hypertension: a guide to optimal patient management?. *Journal of nephrology*. 2016 Dec 1;29(6):747-53.

11. Hall ME, do Carmo JM, da Silva AA, Juncos LA, Wang Z, Hall JE. Obesity, hypertension, and chronic kidney disease. *International journal of nephrology and renovascular disease*. 2014;7:75.

12. Karim AN, Das D, Salahuddin M, Marjan GA, Islam MN, Shaha AK, et al. Prevalence of Microalbuminuria and Overt Proteinuria in Hypertension and Their Relations with Renal Function in a Rural Population of Bangladesh. *Bangladesh Journal of Medicine*. 2014 Apr 25;24(2):59-64.

13. Currie G, Delles C. Proteinuria and its relation to cardiovascular disease. *International Journal of Nephrology and Renovascular Disease*. 2014;7:13.

14. Griffin KA. Hypertensive kidney injury and the progression of chronic kidney disease. *Hypertension*. 2017 Oct 1;70(4):687-94.

15. Currie G, Delles C. Proteinuria and its relation to cardiovascular disease. *International journal of nephrology and renovascular disease*. 2014;7:13

16. Sandsmark DK, Messé SR, Zhang X, Roy J, Nessel L, Hamm LL, et al. Proteinuria, but Not eGFR, Predicts Stroke Risk in Chronic Kidney Disease. *Stroke*. 2015 Aug 1;46(8):2075-80.

17.Vij A. Microalbuminuria in NIDDM and essential hypertension a marker of a severity of disease. JAPI 1998 ; 48(1) :

18.Yudkin JS, Forrest RD, Jackson C. MAU as predictor of vascular disease in non diabetic subjects. Lancet 1998 ; 2 : 530-533

19.Poudyal N, Rana KJ, Srivastav B, Karki B, Basnet B. Frequency of Microalbuminuria in Hypertensive patients with left ventricular hypertrophy. PMJN.2010;10(2):41-44

20.Bianchi S, Bigazzi R, Baldari G, Sgherri G, Campese VM. Diurnal variations of blood pressure

and microalbuminuria in essential hypertension. Am J Hypertens. 1994 Jan;7(1):23-9.

21.Cirillo M, Stellato D, Laurenzi M, Panarelli W, Zanchetti A, De Santo NG. Pulse pressure and isolated systolic hypertension: association with microalbuminuria. The GUBBIO Study Collaborative Research Group. Kidney Int. 2000 Sep;58(3):1211-8.

22.Koroshi A. Microalbuminuria, is it so important?. Hippokratia. 2007 Jul-Sep; 11(3): 105–107

23.Afkhami-Ardekani M, Modarresi M, Amirchaghmaghi E. Prevalence of microalbuminuria and its risk factors in type 2 diabetic patients. Indian J Nephrol. 2008 Jul; 18(3): 112–117.