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ESSENTIAL HYPERTENSION;
FREQUENCY OF MICROALBUMINURIA IN PATIENTS WITH ESSENTIAL HYPERTENSION.

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ABSTRACT… Objectives: To determine the frequency of microalbuminuria in patients with essential hypertension for postpartum hemorrhage. **Study Design:** Cross sectional study. **Setting:** Department of Medicine at Liaquat University Hospital Hyderabad. **Period:** Six months (from January 2015 to June 2015). **Patients and Methods:** All the patients ≥35 years of age both gender had essential hypertension were enrolled and explored for microalbuminuria by urine examination while the data was analyzed in SPSS 16. **Results:** Total one hundred subjects with essential hypertension were studied and explored for microalbuminuria. The mean age ±SD of for overall population was 52.82±7.85 and it was 51.23±8.21 and 53.32±6.52 in male and female gender respectively. The overall mean ± SD for systolic blood pressure was 170±12.62 whereas it was 160.82±10.82 and 165±11.92 in male and female gender respectively. The mean ±SD for blood pressure (diastolic) was 105±71 while it was 95.01±7.21 and 100.82±6.42 in male and female sex respectively. The duration of hypertension as mean ±SD was 3.72±2.52 in overall population. The microalbuminuria was identified in 59 (59%) patients with statistical significance in relation to age (p=0.00), gender (p=0.00), duration of hypertension (p=0.01), treatment status (p= 0.04), hypertension (p=0.002), BMI (p=0.05) and residence (p=0.00). **Conclusion:** In present series the prevalence for microalbuminuria in essential hypertension was detected as 59% and correlate with age, gender and duration and treatment status of the patients along with raised systolic and diastolic blood pressure

Key words: Microalbuminuria, Hypertension and Blood Pressure.

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INTRODUCTION

Hypertension is a common condition results in cerebral, renal and cardiac adverse events.[1] The majority has essential hypertension reveals raised blood pressure of unknown etiology and the condition usually silent due to its asymptomatic origin but can be life threatening to involve the multi organs and can leads to ischemic heart disease, cerebrovascular accidents and renal failure.

Majority individuals with essential hypertension may have subclinical target organ injury involving the cardiac, renal, brain or eye at the time of initial diagnosis and the control of hypertension sometimes problematic due to existence of co-morbidities.[2,3] In this regards, evaluation of sub-clinical target organ injury has the importance among hypertensive population.[4]

Microalbuminuria is the earliest feature of renal impairment in subjects with hypertension and diabetes mellitus.[5] The national kidney foundation, USA reveals microalbuminuria as urine albumin clearance of around 30-300 mg/day in at least two consecutive samples of urine.[6] The link between hypertension and microalbuminuria was defined years ago, former literature pointed out the association of microalbuminuria as a risk factor for kidney and ischemic heart disease in patients with essential hypertension.[7] Microalbuminuria leads to increase kidney endothelial permeability and is labeled an initial indication of endothelial malfunction.[8]

In Pakistan, the reported prevalence for hypertension is 17.9% with higher rate among urban population[6] In India the reported prevalence for hypertension is approximately 25% and the

reported prevalence of microalbuminuria in individuals with essential hypertension is 27%.[7,8]

At present, the local data regarding the essential hypertension and its association with renal impairment is deficient. In this context, this study was conducted at Liaquat university Hospital with an objective to detect the prevalence of microalbuminuria in subjects with essential hypertension.

PATIENTS AND METHODS

The study was conducted Laiquat University Hospital Hyderabad. The study designed was cross sectional descriptive study and the duration was six months (from January 2015 to June 2015). The included participant were subjects, ≥35 years of age, either gender visited at medical OPD for hypertension (>140/90mmHg) or the known subjects of essential hypertension for ≥12 months duration while the exclusion criteria of the study were the patients with diabetes mellitus, secondary hypertension, urinary tract infection, already on hypertension controlling medications, pregnant and lactating ladies and the women during menstrual periods. The hypertension was labeled by clinical maneuver in context to JNC VIII criteria and the microalbuminuria was labeled by biochemical maneuver and considered when the urinary albumin between 30 to 300 mg / day. The consent was taken from every participant while the data analyzed in SPSS 17. The mean ±SD, frequency and percentages was calculated for numerical and categorical variables.

RESULTS

Total one hundred subjects with essential hypertension were assessed. The mean age ±SD of for study population was 52.82±7.85 and it was 51.23±8.21 and 53.32±6.52 in male and female gender respectively. The overall mean ± SD for systolic blood pressure was 170±12.62 while it was 160.82±10.82 and 165±11.92 in male and female gender respectively.

The mean ±SD for blood pressure (diastolic) was 105±71 while it was 95.01±7.21 and 100.82±6.42 in male and female sex respectively. The duration of hypertension as mean ±SD was 3.72±2.52 in overall population. The demographical and clinical observations are presented in Table-I and the findings regarding the microalbuminuria are presented in the Table-II to VIII.

Age (yrs)	Frequency (n=50)	Percentage (%)
35-39	25	25
40-49	24	24
50-59	31	31
60+	20	20
Gender		
Male	60	60
Female	40	40
Residence		
Urban	44	44
Rural	56	56
Duration of Hypertension (yrs)		
1-2	33	33
2-3	46	46
>3	21	21
Treatment Status		
No	29	29
Regular	47	47
Irregular	24	24
Hypertension		
Known case	57	57
Newly diagnosed	43	43
BMI		
Underweight	17	17
Normal	35	35
Overweight	26	26
Obese	22	22

Table-I. The demographical and clinical parameters of the patients

		Microalbuminuria		Total
		Yes	No	
Age (yrs)	35-39	21	4	25
		35.6%	9.8%	25.0%
	40-49	4	20	24
		6.8%	48.8%	24.0%
	50-59	25	6	31
		42.4%	14.6%	31.0%
	60 +	9	11	20
		15.3%	26.8%	20.0%
Total		59	41	100
		100.0%	100.0%	100.0%

Table-II. The microalbuminuria in relation to age *P-value: 0.00

		Microalbuminuria		Total
		Yes	No	
Gender	Male	42	18	60
		71.2%	43.9%	60.0%
	Female	17	23	40
		28.8%	56.1%	40.0%
Total		59	41	100
		100.0%	100.0%	100.0%

Table-III. The microalbuminuria in relation to gender *P-value: 0.00

		Microalbuminuria		Total
		Yes	No	
Duration (yrs)	1-2	25	8	33
		42.4%	19.5%	33.0%
	2-3	20	26	46
		33.9%	63.4%	46.0%
	>3	14	7	21
		23.7%	17.1%	21.0%
Total		59	41	100
		100.0%	100.0%	100.0%

Table-IV. The microalbuminuria in relation to duration of hypertension *P-value: 0.01

		Microalbuminuria		Total
		Yes	No	
Treatment status	No	22	7	29
		37.3%	17.1%	29.0%
	Regular	22	25	47
		37.3%	61.0%	47.0%
	Irregular	15	9	24
		25.4%	22.0%	24.0%
Total		59	41	100
		100.0%	100.0%	100.0%

Table-V. The microalbuminuria in relation to treatment status *P-value: 0.04

		Microalbuminuria		Total
		Yes	No	
Hypertension	known	41	16	57
		69.5%	39.0%	57.0%
	New	18	25	43
		30.5%	61.0%	43.0%
Total		59	41	100
		100.0%	100.0%	100.0%

Table-VI. The microalbuminuria in relation to hypertension status *P-value: 0.002

		Microalbuminuria		Total
		Yes	No	
BMI	Underweight	14	3	17
		23.7%	7.3%	17.0%
	Normal	17	18	35
		28.8%	43.9%	35.0%
	Overweight	17	9	26
		28.8%	22.0%	26.0%
	Obese	11	11	22
		18.6%	26.8%	22.0%
Total		59	41	100
		100.0%	100.0%	100.0%

Table-VII. The microalbuminuria in relation to body mass index (BMI) P-value: 0.05

		Microalbuminuria		Total
		Yes	No	
Residence	Rural	41	15	56
		69.5%	36.6%	56.0%
	Urban	18	26	44
		30.5%	63.4%	44.0%
Total		59	41	100
		100.0%	100.0%	100.0%

Table-VIII. The microalbuminuria in relation to residence *P-value: 0.00

DISCUSSION

Hypertension is associated with diabetic population and is a risk factor for chronic kidney disease (CKD) and CVD (cardiovasular disease).[9,10] The albumin excretion rate leads to adverse renal outcomes in type 2 diabetic population and in cardiovascular adverse events while the reduction in urinary albumin excretion can leads to reduction in adverse cardiovascular and renal events.[11] Increased urinary albumin excretion in the range between 30 to 300 mg/d (i.e. microalbuminuria) has been detected in patients with essential hypertension.[12,13] Recently, it has been observed that patients with essential hypertension (mild to moderate) shown 7% prevalence for microalbuminuria.[14] The proteinuria observed to be nephrotoxic and findings regarding microalbuminuria initiate a careful evaluation in relation to end organ damage aggressive management. Thus the current study was relevant to determine the frequency of microalbuminuria in essential hypertension and included one hundred patients of essential hypertension excluding the population mentioned in the material and method section.

In current series, out of one hundred essential hypertensive cases, fifty nine (59%) patients

observed to have microalbuminuria. Therefore, the prevalence of microalbuminuria in essential hypertension in current study was 59% as compared to microalbuminuria observed in previous literatures ranging from 30% to 48% as reported by Menne J, et al (37%),[15] de la Sierra A, et al (29%),[16] Maharjan BR, et al (35%),[17] Murai S, et al (27.5%),[18] Ali A, et al (40%).[19] It has been identified from above findings that the prevalence of microalbuminuria in present study was higher due to several factors includes life style, dietary habits, duration, severity and compliance to hypertension.

The mean age ± SD of one hundred participants had essential hypertension in current series was 52.82±7.85 years, of these, 59% patients found to have microalbuminuria. The findings are comparable and near to former research done by Falcone C, et al[20] (61.21±4.32 years), Agrawal B, et al[21] (56.82±5.54 years), Habbal R[22] (51.2±5.43 years) respectively.

There were 60 males and 40 females in current study, of which 42 (71.2%) males and 17 (28.8%) females observed to have microalbuminuria that is statistically significant (p=0.00). The consistent findings were detected in the studies by Agrawal B, et al[21] [male 22% and female 18%], Habbal R[22] [male 33.16%, female 29.65%], detected to have microalbuminuria in relation to the gender of the study population.

In current series mean ±SD for diastolic blood pressure was 105±71, the research conducted by Falcone C, et al[20] shown statistical significance for mean diastolic blood pressure in relation to microalbuminuria.

In present study mean systolic blood pressure was 170±12.62, thus, the microalbuminuria relates to severity of systolic hypertension. Jalal S, et al[23] Hitha B, et al[24] and Redon J, et al[25] reported similar observations.

Thus, it has been found that urinary albumin excretion shown abnormalities in permeability of systemic vasculatures and may be a marker of endothelial dysfunction and early atherosclerosis.

In future the follow up and multicenter research is needed to evaluate whether microalbuminuria predict the risk for chronic renal failure in individuals with essential hypertension and its prognosis.

CONCLUSION

In current series the microalbuminuria in essential hypertension was observed in 59% individuals and correlate with age, gender and duration and treatment status of the patients along with raised systolic and diastolic blood pressure. Therefore, it is recommended that aggressive blood pressure control is needed in patients having microalbuminuria to save the population from chronic renal failure and its complications.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Imran Khan	Contribution to conception and design, acquisition of data, analysis and interpretation of data.	
2	Abdul Ghaffar Dars	Drafting the article and shares its expert research opinion and experience in finalzing the manuscript.	
3	Nisar Ahmed Shah	Contributed in conception and interpretation of data and give his expert view for manuscript designing.	
4	Syed Zulfiquar Ali Shah	Collection and acquisition of data, analysis and interpretation of data and make it suitable for final revision and a corresponding author.