



ASSOCIATION OF MICROALBUMINURIA WITH SYSTOLIC AND DIASTOLIC BLOOD PRESSURE IN HYPERTENSIVE PATIENTS

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ABSTRACT

Background: Microalbuminuria is an established marker of kidney as well as cardiovascular damage in diabetics but its association in hypertension is not very well known. As hypertension is a major cause of morbidity and mortality all over world, especially in India. Present study was undertaken to correlate Microalbuminuria with systolic and diastolic hypertension.

Methodology: Thirty patients of hypertension coming to OPD/Wards of MGUMST, Jaipur who fulfilled the inclusion criteria were recruited. They were subjected to detailed history, clinical examination & diagnostic tests. Data analysis was done using SPSS software.

Results: Microalbuminuria has a stronger association with diastolic blood pressure (BP). As 100% patients with stage 2 diastolic BP had microalbuminuria ($p < 0.05$); compared with 84.6% in Stage II systolic hypertension (p value > 0.05).

Conclusion: In hypertension there is a higher prevalence of microalbuminuria in patients with raised diastolic BP compared to systolic BP. We recommend screening for Microalbuminuria in all hypertensive patients as it is an important prognostic marker for cardiovascular as well as renal morbidity & mortality. This will also guide us towards selection of appropriate drugs and formulating preventive strategy.

KEYWORDS : hypertension, diastolic blood pressure, systolic blood pressure, microalbuminuria,

Introduction

Hypertension is a leading cause of disease globally, around 7.6 million death & 92 million disability adjusted life years were attributable to high BP¹. It is an important public-health challenge because it multiplies the risk of cardiovascular disease ischemic and hemorrhagic stroke renal disease as well as peripheral vascular disease.^{1,2,3}

With increasing life expectancy things are becoming even more complicated. Moreover large segment of hypertensive population are either untreated or sub optimally treated.

Microalbuminuria is considered as strong predictor of premature cardiovascular & renal compromise in these patients. Studies have suggested that even very low levels of microalbuminuria (4.5 microg/min), well below the microalbuminuria threshold) will increase vascular compromise⁴.

There are strong emerging data that reduction of microalbuminuria brings down the risk of adverse renal and cardiovascular events. Spot urine ACR is the preferred office test for microalbuminuria. It should be done as part of routine assessment of newly diagnosed hypertensive patients⁵.

Material and Methods

Our study was conducted in Mahatma Gandhi Medical College & Hospital, Jaipur. It was a cross sectional study of 30 patients of Hypertension meeting inclusion and exclusion criteria as mentioned below.

Inclusion criteria

Patients with hypertension.

Exclusion Criteria

History of MI / Angina
Heart failure
Atrial fibrillation
Left bundle branch block
Diabetes
High serum calcium levels
Urinary tract infection

History of drug intake like angiotensin- converting- enzyme inhibitor or angiotensin 2 receptor blocker.

Smoking

Random sampling method was used to select the sample group by applying above inclusion and exclusion criteria. Detail history and thorough clinical examination was done as per the predefined performa. Systolic and diastolic BP was recorded using mercury sphygmomanometer in right arm supine position.

NycoCardTM U-Albumin is a rapid in vitro test for measurement of low albumin concentrations in human urine. It was performed for all the patients enrolled in our study.

Results

TABLE 1: ASSOCIATION OF MICROALBUMINURIA WITH DIASTOLIC BLOOD PRESSURE IN HYPERTENSION

Group	Diastolic Blood Pressure	MICROALBUMINURIA		Total
		Absent	Present	
HTN	Normal	2 66.7%	1 33.3%	3 100.0%
	Pre HTN	2 28.6%	5 71.4%	7 100.0%
	Stage- I HTN	4 30.8%	9 69.2%	13 100.0%
	Stage- II HTN	0 0.0%	7 100.0%	7 100.0%
	Total	8 28.7%	22 73.3%	30 100.0%

Chi square trend: 4.79, p -value < 0.05

This table shows that proportion of cases having Microalbuminuria with increases in diastolic blood pressure correlate with severity of hypertension i.e. 5 (71.4%) patients had Microalbuminuria in pre hypertension stage, 9 (69.2%) patients had Microalbuminuria in Stage I hypertension and 7 (100%) patients had microalbuminuria in stage II hypertension. This relation is statistically significant. (p value < 0.05)

GRAPH 1: ASSOCIATION OF MICROALBUMINURIA WITH DIASTOLIC BLOOD PRESSURE IN HYPERTENSION.

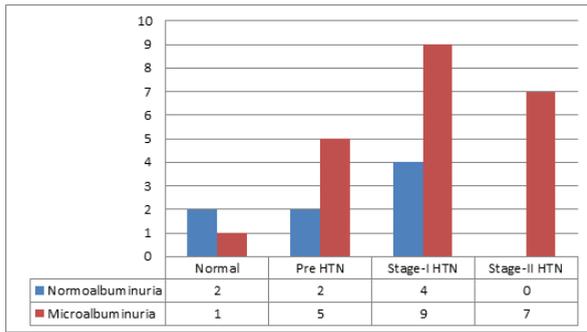


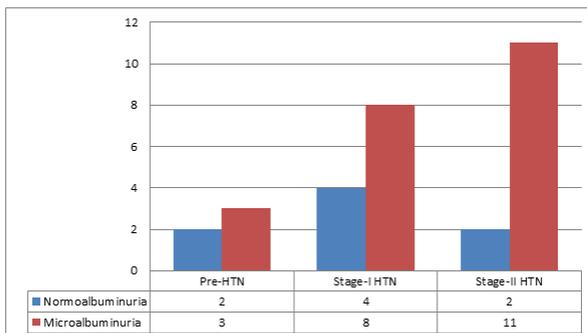
TABLE 2: ASSOCIATION OF MICROALBUMINURIA WITH SYSTOLIC BLOOD PRESSURE IN HYPERTENSION GROUP

Group	Systolic Blood Pressure	MICROALBUMINURIA		Total
		Absent	Present	
HTN	Pre HTN	2 40%	3 60%	5 100.0%
	Stage- I HTN	4 33.3%	8 66.7%	12 100.0%
	Stage- II HTN	2 15.4%	11 84.6%	13 100.0%
Total		8 26.7%	22 73.3%	30 100.0%

Chi square trend: 2.16, p-value > 0.05

This table shows that proportion of cases having microalbuminuria with increase in systolic blood pressure increases with severity of hypertension i.e. 3(60%) patients had microalbuminuria in Pre hypertension stage, 8(66.7%) patients had microalbuminuria in Stage I hypertension and 11(84.6%) patients had microalbuminuria in Stage II hypertension. Although this relation is statistically insignificant. (p value > 0.05)

GRAPH 2: ASSOCIATION OF MICROALBUMINURIA WITH SYSTOLIC BLOOD PRESSURE IN HYPERTENSION GROUP



Discussion

This study was intended to access the association of diastolic BP with Microalbuminuria as well as systolic BP with Microalbuminuria. We wanted to observe which of the two had stronger association with this factor. We ruled out diabetes in the study group as it is a proven cause of Microalbuminuria as this may have impacted our study adversely.

Our study shows that the percentage of patients having Microalbuminuria with increase in diastolic blood pressure increases with severity of hypertension. 5 (71.4%) patients had Microalbuminuria in pre hypertension stage, 9 (69.2%) patients had Microalbuminuria in Stage I Hypertension and 7 (100%) patients had microalbuminuria in stage II hypertension and this relation is statistically significant. The Chi square trend: 4.79, p-value < 0.05.

According to table 2 the proportion of cases having microalbuminuria with Systolic blood pressure also increases with severity of hypertension. It shows 3(60%) patients having

microalbuminuria in Pre Hypertension stage, 8(66.7%) patients having microalbuminuria in Stage I Hypertension and 11(84.6%) patients with microalbuminuria in Stage II Hypertension but this relation is statistically insignificant. With Chi square trend: 2.16, p-value > 0.05.

M. Afkhami-Ardekani et. al⁷ showed in their study of 288 subjects that that microalbuminuria in patients with raised systolic BP of \geq & <130 mmHg was 17.5 & 10.2% respectively. There was no significant correlation between raised systolic BP & microalbuminuria (p=0.076) but the prevalence of microalbuminuria in patients with diastolic BP < and \geq 85mmHg was 11.7and 27.5% respectively (p=0.003). This was definitely significant as inferred in our study.

In a recently published study (9th of march 2018) in BMJ A Vargese at. Al⁸. The aim of their study was to determine the prevalence and risk factors for microalbuminuria among south Indian type 2 diabetic patients. 1425 patients were studied and multivariate analysis concluded that DBP was independent risk factor for Microalbuminuria in these patients.

The above mentioned studies (7,8) were done in diabetic subjects but systolic and diastolic blood pressure were accessed separately.

In yet another study done by Bibek Pondel et. al.⁹ a case control study of 106 case and similar number of controls were studied, they found strong association between microalbuminuria and hypertension. As hypertension is a established risk factor for cardiovascular and renal disease, by showing association between microalbuminuria and hypertension, their findings suggested that microalbuminuria could be a useful marker to assess risk management of cardiovascular & renal disease irrespective of diabetic status of patient.

Further studies in larger population with newer guidelines of hypertension are required for confirmation of microalbuminuria as a screening tool in patients of hypertension without diabetes.

We proposed this with intent to treat; as timely and active intervention in these patients with angiotensin Converting Enzyme inhibitor and angiotensin 2 receptor blocker drugs with rigorous follow up can be game changer in the mortality and morbidity benefit of patient.

Conclusion

In our study we found that there was a stronger correlation of raised diastolic BP with urinary Microalbuminuria compared to raised systolic BP. It indicates excess cardiovascular as well as renal morbidity and mortality in these patients.

This was independent of diabetic status of patient. We recommend screening for Microalbuminuria in newly diagnosed hypertensive patients. Special attention should be given to patients with raised diastolic BP. We should also formulate a regimen of measuring Microalbuminuria at regular intervals. This will help us in taking timely therapeutic measures to prevent any major adverse cardiovascular as well as renal event.

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