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Correlation of Different Variables and Complications of Acute Coronary Syndrome With Microalbuminuria.

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ABSTRACT

BACKGROUND:The current study was undertaken at tertiary care center ,Bhopal, MP, Central India. with the objective is to study the occurrence of microalbuminuria in acute coronary syndrome and to find their association with different variables and complication of acute coronary syndrome.

MATERIALS AND METHODS: The present study was carried out during period jun2009 to 2010 on patients presenting to the cardiology department Hamidia hospital ,Bhopal,MP.It was an observational comparison study in which comparison of two groups according to the presence and absence of microalbuminuria in patient diagnosed to have acute coronary syndrome after proper history ,thorough clinical examination and investigations and find their correlation with different variables and complications in acute coronary syndrome.

RESULTS AND CONCLUSIONS:This observation implies that microalbuminuria is significantly more commonly seen in patients with acute coronary syndrome as compared to healthy adults of same biological characteristics andit is associated with increased systolic and mean BP and decreased left ventricular ejection fraction(LVEF) and it predisposes a patient to get left ventricular dysfunction more commonly as compared to a patient without microalbuminuria.

KEYWORDS : .Microalbuminuria2.Hypertension3.Acute coronary syndrome 4.Left ventricular dysfunction.

INTRODUCTION:

Albuminuria has been shown to predict cardiovascular (CV) morbidity and mortality in individuals with both type 1 and type 2 diabetes mellitus (DM) independent of conventional CV risk factors including age, arterial hypertension, and hypercholesterolemia.[1,2,3,4,5.]Although the mechanism of the association of albuminuria with cardiac events is not clear, it is possible that the vascular changes that lead to renal dysfunction may also be present in the vasculature of the heart and, thus contribute to cardiac dysfunction.[6,7]

Microalbuminuria has been now recognized as the most important risk factor for the increased morbidity and mortality in the obese population.With the rapidly growth of the obesity epidemic whole of the world, a better understanding of the risk factors for the complications of obesity is critical. Nowadays, microalbuminuria has been now recognized as the most important risk factor for the increased morbidity and mortality in the obese population .[8,9,10,11] In this parallel, central obesity has received more attention as a potential risk factor for renal insufficiency in nondiabetic normotensive subjects .[12,13] The mechanisms of this association are now unclear and might be mediated by adipogenic inflammation as well as endothelial dysfunction giving microalbuminuria. Besides, obesity is associated with subtle effects in the decline of kidney function and low-grade albuminuria ,[14,15,16,17] and this event potentially results in appearance and progression of cardiovascular diseases in obese patients .[18] Several key early studies established a potential important relationship between obesity and microalbuminuria. However, association between the severity of obesity and appearance of microalbuminuria is unknown.The objective of our study is to find the occurence of microalbuminuria in patients with acute coronary syndrome and its association between complications of ACS and other variables.

MATERIALS AND METHODS:

The present study was carried out during the period of june2009 to september2010 on patients presenting to the cardiology department in Hamidia hospital Bhopal,M.P.It was an observational comparision study,in which intra group comparison was the main focus of analysis. This comparison was done between two groups formed in the study cases by dividing them in two groups according to the presence or absence of microalbuminuria.

Firstly the study population cohort was compared with age and sex matched control population from the same demographic an socioeconomic background for confirming the observation that microalbuminuria was frequent in the study population compared to general population.

All the patients who presented with the history ,physical examinations and investigations(ECG,cardiac enzymes) satisfying the criteria for diagnosis of an acute coronary syndrome –including unstable –angina and myocardial infarction were included in the study.

After proper history and thorough clinical examinations including systolic and diastolic blood pressure were recorded and other data regarding history of hypertension , diabetes,tobacco use,smoking,past and family history of CAD were noted. Athropometric measurements including height,weight,waist circumference were recorded and BMI were deduced.

Every patients first morning urine sample on his or her second post admission day was collected and analysed using immunoturbidometric analysis.Microalbuminuria was defined as presence of 30-300mg/liter of albumin in spot urine sample.

Patient received appropriate treatment according to standard protocol and after stabilization patient were subjected to 2-Dechocardiography on day 5.Presence of regional wall motion abnormality,ejection fraction andany other abnormality like pericarditis,apical aneurysm,-valvular regurgitation and relevant findings were recorded.

Subsequently, the patient were followed for the development of any arrhythmias, any conduction defect,left ventricular dysfunction or any other complications or death during their period of hospitalization (average:5days).

The entire data was anlaysed and stastical tests were applied as and when appropriate.

Inclusion criteria:

All the patients with history of chest pain and diagnosis consisting of ACS were included in the study regardless of other parameters.

Exclusion criteria:

1.Those with presence of preexisting renal failure were excluded.

2.Those with stable ischaemic heart diseases were not included.

3.Those with suspected ACS but investigations suggesting alternating diagnosis were excluded.

RESULTS:

In the present study , there was a comparision between microalbuminuria positive and microalbuminuria negative patients with acute coronary syndrome .There were 55 cases satisfying the criteria for the diagnosis ofACS as mentioned earlier.Microalbuminuria in case population was found to be 61.81% of patient ,where as in control population comprising of 14.81%.On comparision of these two populations, the difference between occurrence of microalbuminuria was found to be stastically significant(x^2=11.7 and p<0.05).(Table:1)

	CASES	CONTROLS	COMMENTS
TOTAL NUMBER	55	27	
MALES	47(85.47%)	23(85.18%)	p>0.05
FEMALES	8(14.54%)	4(14.81%)	p>0.05
SEX RATIO	5.875	5.75	
MEAN AGE	52.78±12.96yrs	53±10.61yrs	p>0.05
TOTAL MA+ve(PATIENTS)	34(61.81%)	4(14.81%)	P<0.05
TOTAL MA+ve(MALES)	28(59.57%)	4(100%)	P<0.05
TOTAL MA-ve(FEMALES)	6(75%)	0	

Table:1.Shows the characteristics of cases and control in the study.

This observation implies that microalbuminuria is significantly more commonly seen in patients with ACS as compared to normal healthy population of same biological characteristics.

	MALES	FEMALES	COMMENTS
TOTAL CASES	47	8	
MA+VE CASES	28	6	p>0.05
MA-VE CASES	19	2	p>0.05
MEAN AGE	50.55±11.6yrs	65±13.88yrs	p>0.05 but <0.1

Table :2. Shows variables in males and females in the present study.

Mean age of males with acute coronary syndrome was 50.55+ 11.6yrs and that of females with ACS was 65yrs + 13.88yrs. This observation suggests that females with ACS were older than males.Table:3 shows correlation of MA with different variables.

VARIABLE	Total cases	MA+ve		MA-ve		pvalue	Significance
	Mean	Mean	SD	Mean	SD		
Avg.SBP (mmhg)	128.70	134	17.75	119.05	17.05	P<0.05	significant
Avg.DBP (mmhg)	79.69	80.72	9.52	78.44	7.95	p>0.05	Not significant
Avg. mean BP(mmhg)	96.02	98.48	12.26	91.97	10.98	P<0.05	significant
Avg. Body weight	74.25	70.09	8.61	73.5	9.82	p>0.05	Not significant
Avg.BMI	26.16	26.59	2.39	26.67	1.75	p>0.05	Not significant
Avg. Lvef(%)	56.43	53.63	5.42	56.83	5.45	P<0.05	significant

Table:3 shows correlation of MA with different variables

Mean systolic blood pressure(SBP) of all cases was 128.70mmhg and that of MA positive was 134+SD17.75mmhg.Mean SBP of MA negative patients was 119.05+SD17.05mmhg.This difference between mean SBP of MA positive and MA negative cases was found to be statistically significant(p<0.05).

Mean BP of MA +ve cases was 98.48+12.26mmhg.Mean BP of MA –ve cases was 91.97+10.98mmhg.The difference was stastically significant (p<0.05).This indicates that patients with higher systolic and mean BP are likely to have microalbuminuria.

Mean LVEF of MA+ve cases was:53.63 +5.42% and mean left ventricular ejection fraction(Lvef) of MA –ve cases was 56.83+5.45%.The difference was statiscally significant (p<0.05).This indicates that patients with microalbuminuria tend to have lower ejection fraction as compared to patients without microalbuminuria.

In MA+ve patients there were 15 cases with left ventricular dysfunction(LVD),where as in MA-ve cases,there were only 3 cases with LVD.This difference was stastically significant. Table:4.Shows complications of ACS in cases.

Complications	Total(n=55)	MA+ve	MA-ve	P Value	Significance
Total no.of complicated patients	36(65.45%)	25(73.52%)	11(52.38%)	p>0.05	Not significant
LVDysfunction	18	15	3	P<0.05	Significant
	32.72% of total cases	44.11% of total MA+ve	14.28%of total MA-ve		
	50%of complicated cases	60% of complicated MA+ve-cases	27.27%of complicated MA-ve		
Arrythmias	6(10.55%)	4(11.76%)	2(9.5%)	p>0.05	Not significant
Tachycardia	0	0	0		
Bradycardia	6	4	2		
CHB	4	2	2		
BBB	1	1	0		
Any other	1	1	0		
Cardiogenic shoock	2(3.6%)	1(2.9%)	1(4.7%)	…	….
OTHERS	10(18.18%)	5(14.7%)	5(23.80%)	…	….
Regurgitation	7	3	4		
LV apical aneurysm	1	1	0		
Pericarditis	2	1	1		
No complications	19(34.55%)	9(26.47%)	10(47.61%)	….	….

Table:4.shows complications in acute coronary syndrome.

Other complications were also seen more commonly in MA+ve cases compared to MA-ve cases, but no stastically significant difference was found in them.

DISCUSSION:

In our study,mean age of males with acute coronary syndrome was 50.55+ 11.6yrs and that of females with ACS was 65yrs + 13.88yrs similar to the INTERHEART study[19] where age distribution was mean age of 59+12 for males and women were older than males by 5.4yrs .Various studies from all over world ,including Asia and India,suggest the maximum no of patients with MI or CAD are from the age group of 50-60yrs.Case series study from Iran in 2001,average age of patients was 59.1+12.2yrs and in 1991

this figure was 59.18+10.8 yrs(p=0.94)

In our study females with acute coronary syndrome were older than males similar to INTERHEART study.

In the present study, we found significant association between systolic BP and mean BP and microalbuminuria(mean SBP of MA+ve cases:134+17.75mmhg that of MA –ve patients :119.05+17.05mmhg (p<0.05) as comparision to other studies by Knight EL etal[20] found that MA was associated with high normal range of SBP,DBP and mean BP in subjects without preessential hypertension and study by Massoud A etal[21] found significant association with SBP and DBP of developing a 5yrs risk of MA ,they also found that presence of hypertension means a 3.9 times higher risk of developing MA.

In our study,we found a significant difference in BMIs of cases with MA and those without MA(p<0.05) as compare to the study by Sibal L etal[22] found that the people who develop macroavascular complications were older(p=0.000),has longer duration of diabetes(p=0.000), higher BMIs(p=0.041) , high SBP (p=0.000) and these factors predicted development of macrovascular complications,which were also associated with the later development of microalbuminuria. Another study by Martin T etal[23] found that BMI and waist circumference was associated with the occurrence of microalbuminuria an early marker of cardiovascular risk and renal risk.Another study by Massimo C etal[24] suggested that BP,plasma cholesterol levels,smoking and BMI significantly related to urinary albumin excretion and the prevalence of microalbuminuria.

In our study patient with microalbuminuria tend to have lower Lvef than patient without MA similar to the study by Bahrami etal.[25]

In the present study, left ventricular dysfunction were more common in MA+ve as compare to MA-ve patients as compare to the study by Bahrami etal, which says that LVD is one of the pathways via which albuminuria leads to increase in risk of heart failure.Another study by Liu etal,[26] showed that albuminuria is associated with LV systolic and diastolic dysfunction and screening for albuminuria may identify individual with cardiac dysfunction.

CONCLUSIONS:

The present study concluded that from the above observation microalbuminuria occurs more frequently in ACS than in healthy population, it is associated with increased systolic and mean BP and decreased left ventricular ejection fraction(LVEF) and it predisposes a patient to get left ventricular dysfunction more commonly as compared to a patient without microalbuminuria.

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