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A STUDY ON RISK PROFILE OF ACUTE MYOCARDIAL INFARCTION PATIENTS AT A PERIPHERAL MEDICAL COLLEGE, TAMIL NADU.

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ABSTRACT
A study on risk profile of acute myocardial infarction patients at peripheral Medical College, Tamil Nadu. **Importance:** Acute myocardial infarction is one of the important causes of mortality. The awareness about its risk factors in the population may help to curb its mortality and morbidity. **Aim:** To asses the risk profile in acute myocardial infarction patients at peripheral Medical College, Tamil Nadu. **Design:** Case control study. **Setting and Participants:** The study was conducted at Government Villupuram Medical College and Hospital, Southern India. A total of 50 patients who presented with acute myocardial infarction confirmed by ECG were enrolled into the study. A detailed history regarding various risk factors like smoking, alcohol intake, hypertension, diabetes, dyslipidemia, obesity was taken. Fifty normal persons without any evidence of coronary artery disease were taken as control subjects and risk factors correlated. **Results:** A total of 50 case and controls were studied. The risk factors of obesity ($p<0.01$), smoking($p<0.01$), alcohol($p<0.01$), diabetes($p<0.01$), hypertension($p<0.01$), dyslipidemia ($p<0.01$) were all significant indicating these risk factors have an high influence on incidence of coronary artery disease. Within the study group cases with more than 3 risk factors were found to have earlier incidence of myocardial infarction (71%). Gender based study with the cases also confirmed that comparatively females had later onset of the disease. **Conclusion:** Creating awareness about risk factors of MI and working towards altering the lifestyle and minimizing the risk factor can invariably prevent MI. The importance of primary prevention and screening of non communicable disease is emphasized.

KEYWORDS: Acute myocardial infarction, risk factors, primary prevention.

INTRODUCTION
Myocardial infarction is a multifactorial disease, both genetic and environmental risks affect the disease. The risk factors have been classified as traditional and novel, and modifiable and non-modifiable. The non-modifiable risk factors include age, sex, ethnicity/race and family history. The effect of cardiovascular modifiable risk factors including dyslipidaemia, smoking, hypertension, diabetes, abdominal obesity was discussed in INTERHEART study and it is established that risk factors were consistent throughout all populations and socioeconomic levels studied.[1] Therefore awareness about modifiable risk factors and its prevention can alter the outcome of the disease.

AIM
To assess the risk profile in acute myocardial infarction patients at peripheral Medical College, Tamil Nadu.

MATERIALS AND METHODS
This study was conducted in the department of general medicine government villupuram medical college. A total of 50 patients who presented with acute myocardial infarction confirmed by ECG were enrolled into the study. A detailed history regarding various risk factors like smoking, alcohol intake, hypertension, diabetes, dyslipidemia, obesity was taken. Blood sugar and lipid profile and CRP estimation were done. Standard guidelines for the treatment of acute myocardial infarction were followed. Fifty normal persons without any evidence of angina were taken as control subjects and risk factors correlated.

Inclusion Criteria
Patients who presented within 12 hours of onset of angina and who gave informed consent to participate in the study were included.

Exclusion Criteria
Patients with rheumatic heart disease and collagen vascular disease and patients with the previous history of stroke were excluded from the study. Statistical analysis SPSS software was used for statistical analysis. Pearson

chi-square test used for analysis. 'P' value <0.05 was considered as significant.

RESULTS
A total of 50 case and controls were studied. The risk factors of obesity (p<0.01), smoking(p<0.01), alcohol(p<0.01), diabetes(p<0.01), hypertension (p<0.01), dyslipidemia(p<0.01) were all significant indicating that these risk factors have an high influence on incidence of coronary artery disease. Contrary to common belief, increasing age was not significantly associated with increased incidence of MI's. Within the study group cases with more than 3 risk factors were found to have earlier incidence of myocardial infarction (71%). Gender based study with the cases also confirmed that comparatively females had later onset of the disease. The results are summarized in Table 1.
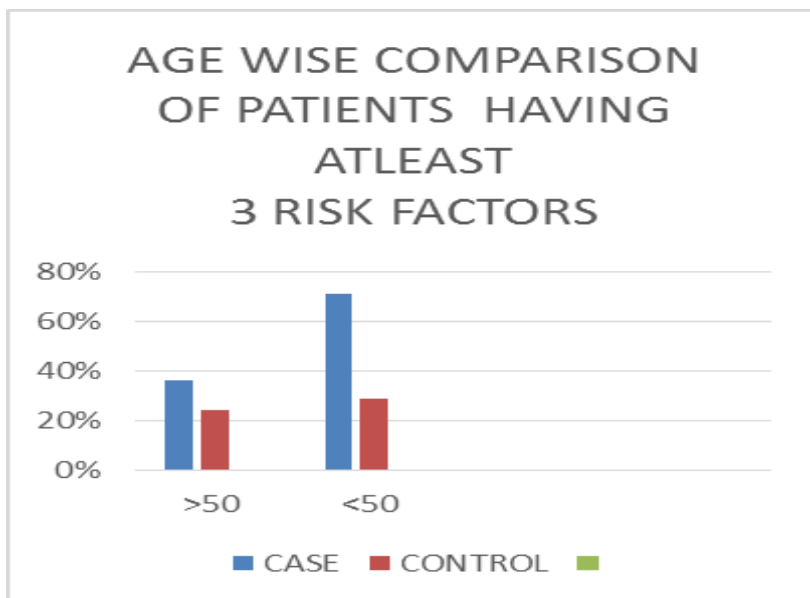

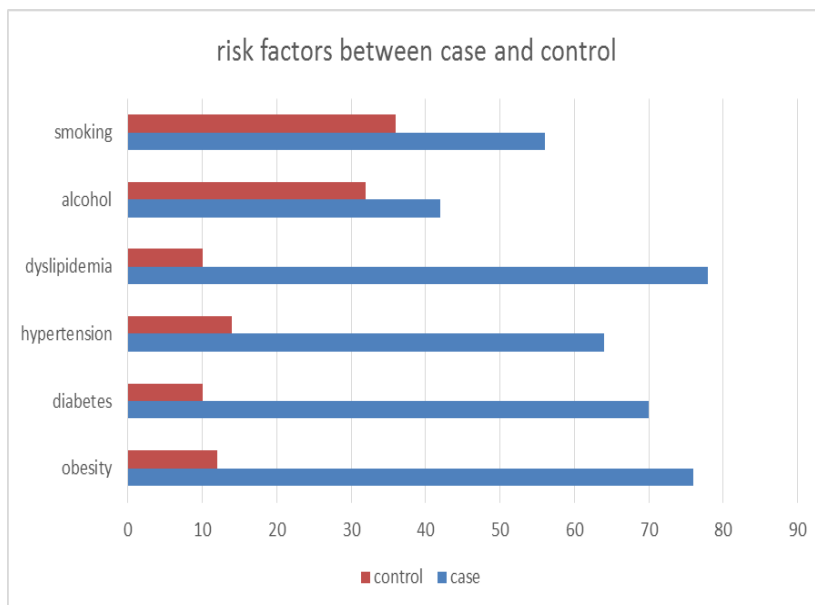**Figure 1: Agewise comparison of patients having at least three risk factors.**

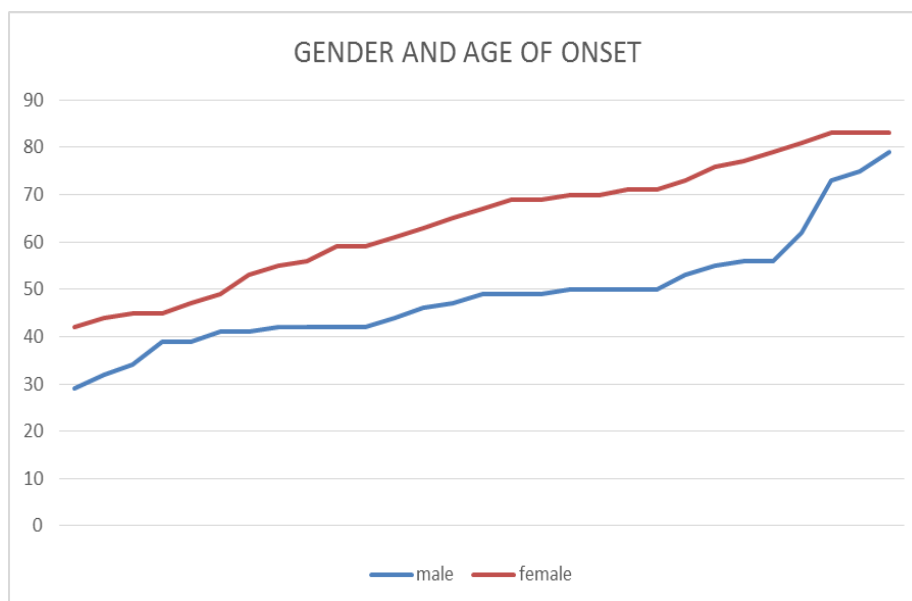**Figure 2: Comparison of risk factors between cases and controls.**

Figure 3: Comparison with Cases Based On Gender.

Table 1: Risk factors associated with occurrence of Myocardial Infarction at Govt Villupuram Medical College.

RISK FACTOR	GROUP	CASES	CONTROL	TOTAL	P VALUE
AGE	>50	22	25	47	>0.05 INSIGNIFICANT
	%WITHIN GROUP	44%	50%	47%	
	<50	28	25	53	
	WITHIN GROUP	56%	50%	53%	
GENDER	MALE	30	28	58	
	% WITHIN GROUP	60%	56%	58%	> 0.05 INSIGNIFICANT
	FEMALE	20	22	42	
	% WITHIN GROUP	40%	44%	42%	
OBESITY	yes	38	6	44	
	% WITHIN GROUP	76%	12%	44%	<0.01 SIGNIFICANT
	no	12	44	56	
	% WITHIN GROUP	24%	84%	56%	
SMOKING	yes	28	18	46%	
	% WITHIN GROUP	56%	36%	46%	<0.01 SIGNIFICANT
	no	22	32	54%	
	% WITHIN GROUP	44%	64%	54%	
ALCOHOL	yes	21	16	37%	
	% WITHIN GROUP	42%	32%	37%	<0.01 SIGNIFICANT
	no	29	34	63%	
	% WITHIN GROUP	58%	68%	63%	
DIABETES	yes	35	5	40%	
	% WITHIN GROUP	70%	10%	40%	<0.01
	no	15	45	60%	SIGNIFICANT
	% WITHIN GROUP	30%	90%	60%	
HYPERTENSION	Yes	32	7	39%	
	% WITHIN GROUP	64%	14%	39%	<0.01 SIGNIFICANT
	no	18	43	61%	
	% WITHIN GROUP	36%	86%	61%	
DYSLIPEDIMIA	yes	39	10	39%	
	% WITHIN GROUP	78%	20%	39%	<0.01 SIGNIFICANT
	no	11	40	51%	
	% WITHIN GROUP	22%	80%	61%	

DISCUSSION

Age and sex matched cases and control were taken into consideration. Here our results are in correlation with the Interheart study which states that, incidence of MI is more in the younger population than the older population when there is a cluster of risk factors.[1] In our study MI had occurred as early as 29 years of age with diabtes, smoking, dyslipidemia and male gender as risk factor.

Obesity

Prospective data from the emerging risk factor collaboration ERFC have shown that BMI, waist circumference and waist-to-hip ratio each have influential associations with coronary disease.[2] a study in 2007 demonstrated that the risk for mortality is lower in obese patients with MI than patients with normal body mass index (BMI).[3] In Dhoot's study, the mortality of patients with obesity was lower than those not obese.[4] In contrast, INTERHEART demonstrated that abdominal obesity increased the risk of AMI in both ages and sexes in all regions.[1] Previous studies also prove that overweight and obesity independently increased the risk of cardiovascular disease in patients with type 2 diabetes.[5] These paradoxical results may be due to the fact that waist to hip ratio showed a more significant association with MI than body mass index. In our study we compared the body mass index and waist to hip ratio of the cases and controls to screen for obesity. Our study showed significant correlation between obesity and MI in correlation with INTERHEART study.

Smoking

Smoking has long been known as the major risk factor for MI.[6] European data indicate that smoking doubles the 10 year CVD mortality rate[7] whilst 30% of US cardiovascular disease mortality is attributable to smoking.[8] Not only is it deleterious but this effect is dose related with no safe lower limit seen.[9] Passive smoking is similarly harmful as workplace exposure increases CVD risk by 30%. Stopping smoking is the single most cost-effective intervention in CVD prevention and some benefits are seen within months of cessation.[8,10]

Smoker's paradox": an intermittently observed association between smoking status and *improved* short-term outcomes in various cardiovascular disease states was first noted in a 1977 study.[11] Recent studies also prove smoking to be an independent protective predictor against adverse LV remodelling during short-term follow-up, consistent with the 'smoker's paradox'. But overall, the long term effect smoking is always considered to be harmful and also in consistent with intramyocardial hemorrhage.[12]

Our study showed significant p value, which confirms smoking being an importance risk factor for MI. In our study total population of cases were chronic smokers with onset of smoking at 15 years of age the earliest. 60% of the population of cases began smoking at age less than 20, of this about 22% of the population developed MI before 40 years of age. This also proves the hypothesis that early onset of smoking has earlier risk of MI.[8]

Alchohol

Alcohol consumption and its effect on myocardial infarction is a controversial subject. The difficulty exists as historically the evidence suggested a J-shaped curve when it comes to risk, where abstinence is associated with an increase in CVD compared to light drinkers, with low levels of alcohol consumption associated with a lower level of CHD.[13] Also evidence from the INTERHEART study would appear to substantiate these claims, showing reductions in risk for those with moderate and light use of alcohol.[14] But binge drinking is associated with a higher risk of cardiovascular disease[15,16] and of mortality after MI.[17,18]

In our study alcohol consumption was proven to be a risk factor. No protective effect was found. This is due to the fact that all the cases were chronic alcoholics and not light drinkers.

Diabetes Mellitus

Cardiovascular morbidity is the main cause of death in diabetics. As diabetes mellitus progresses, it results in endothelial dysfunction and changes in energy metabolism which lead to atherosclerosis in medium- and large-caliber arteries, creating lesions in coronary, cerebrovascular and peripheral arteries. Additionally, atherosclerotic plaques tend to develop much earlier, advance more swiftly and are more diffuse in diabetic patients than in non-diabetics.[19] These factors contribute to a two to four-fold higher risk of cardiovascular events in diabetics compared to non-diabetics, with cardiovascular disease being the main cause of death. The combined mortality rate due to cardiovascular disease and diabetes mellitus is 245/100000 population for adults aged 30 to 70 years according to World Health Organization report.[20]

The overall frequency of coronary artery disease (CAD) among diabetics is 55%. To date, 90% of the published studies presenting data on the atypical presentation of chronic and acute ischemic heart disease are common in type 2 diabetics.[21] A recent meta analytical study shows a greater incidence of silent atypical presentation of MI in diabetics and concluded that cardiac autonomic neuropathy in SMI is still debatable, but is the most acceptable cause of SMI.[19] A study by Richard showed that ACE inhibitors counteract many of the established and putative mechanisms accounting for the increased mortality of MI in diabetes mellitus. The authors imply that diabetic patients benefited more from lisinopril than nondiabetic patients, independent of other risk factors for elevated mortality.[22]

In our study diabetes and MI showed a hand in hand relationship. MI was much prominent in the population

which irregular treatment which may be attributed to the accentuated endothelial dysfunction.

Hypertension
There is good evidence from different sources pointing to the role of hypertension in accelerating if not initiating atherosclerosis.[23] Antecedent hypertension associates with higher rates of death and morbid events both during the early and long-term course of AMI, particularly if complicated by left ventricular dysfunction and/or congestive heart failure.[24]

The data available up to now indicate hypertensive patients with STEMI are more likely to be older, female, of non-white ethnicity and having a higher prevalence of comorbidities such as diabetes, hypercholesterolemia, chronic renal failure, history of cardiac heart failure, prior myocardial infarction and prior myocardial revascularization.[25] The Interheart study also emphasizes on the fact that women with hypertension are more prone to MI however the age of occurrence is always more than men.

Our study was also consistent with the Interheart study. The earliest incidence of MI began at the age of 40 in women with risk factor, whereas in males with risk factor patients are seen as early as 29 years of age.

Patients with both diabetes and hypertension are at more risk than the individual factors. In the Hypertension in Diabetes Study, patients with hypertension and concomitant diabetes compared to nonhypertensive diabetics were found to have higher rates of cardiovascular death, myocardial infarction, angina pectoris, amputation and stroke independent of other risk factors.[26] The study in 2003 indicates that while the use of ACE inhibitors was associated with a reduced risk of in-hospital death in hypertensive patients suffering an AMI, the use of diuretics and calcium blockers was associated with increased risks.[27] Also, in our study hypertension was proven to be a major risk factor.

Dyslipedimia
Elevated LDL levels and triglycerides are important risk factors of myocardial infarction. There is a solid link between elevated cholesterol (especially LDL-C) and cardiovascular disease. It has been conclusively shown and become accepted practice to lower LDL-C in patients considered intermediate to high risk for CVD with a combination of therapeutic life style change and medications. First line drug therapy should be a statin, titrated to keep LDL-C at or below the target range recommended by the ATP-III guidelines.[28]

In a recent meta-analysis of 14 statin studies including 90 056 patients, lowering LDL-C by 39 mg/dl (1 mmol/l) was associated with about one-fifth reduction in the 5-year incidence of major Cardiovascular events[29] Lifestyle interventions that include reduction in total calories as well as intake of saturated and trans fats that

are coupled to increased physical activity with associated weight loss continue to play an important a role in controlling mixed dyslipidemia.[3] In our study relationship between dyslipidemia and myocardial infarction was significant.

CONCLUSION
Risk factor assessment along with overall MI risk estimation should be part of the evaluationof patients NON COMMUNICABLE DISEASE CLINIC. The patients who are already victims of diabetes and hypertension should be explained about life style modifications and physical excercises. The importance of primary prevention of MI should be inititated at every level of the community. Pharmacotherapies witH Statins and ACE inhibitors should be encouraged. This may prevent in a second event of myocardial infarction.

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