

Risk Factors for Acute Myocardial Infarction

1. Javed Akhter Rathore 2. Muhammad Saleem 3. Massood Ahmed

1. Asstt. Prof. of Medicine, AJK Medical College Muzaffaraabad 2. Consultant Physician, DHQ Hospital Kotli
3. Eye Consultant AK CMH/SKBZ Muzaffarabad

ABSTRACT

Objective: Objective of the study is to identify risk factors for Acute Myocardial Infarction (AMI).

Study Design: Prospective cross sectional study

Place and Duration of Study: This study was carried out at AK CMH/SKBZ Muzaffarabad from August 2012 to September 2013.

Materials and methods: This study of first ever AMI patients was carried out in a tertiary care teaching hospital. Standard methods were followed to elicit risk factors. Chi-square and Fishers exact tests on SPSS 20 were done for analysis of risk factors.

Result: A total of 210 patients (male (M) = 118 and female (F) = 92) with age range from 30 to more than 70 years were included. The mean age of patients was 56.30 ± 13.79 years. The risk of developing AMI was statistical significantly in both males and female ($p < 0.001$). The significant risk factors for all AMI were: Hypertension ($p = 0.039$), diabetes ($p = 0.001$), Hypercholesterolemia ($p = 0.05$), smoking ($p = 0.001$) and family history of AMI ($p < 0.001$). Age ($p < 0.001$) and age category ($p = 0.045$) were also identified as statistical significance risk factor for AMI. Mortality was 24 (11.4%).

Conclusion: Thus we conclude that CAD is more common in adult and has significant association with modifiable major risk factors in our population. Targeted interventions that reduce or modify these modifiable CAD risk factors could substantially reduce the mortality and morbidity of AMI. Health educations on life style modification, programs to diagnose, control of diabetes, hypercholesterolemia and hypertension have to be initiated at community level in order to reduce the occurrence.

Key Words: Coronary artery disease, Adults, Risk factors.

INTRODUCTION

Cardiovascular disease (CVD) is a major global health problem¹ and accounting for very high mortality.² Modifiable risk factors such as smoking, diabetes mellitus, hypertension and dyslipidemia are associated with coronary artery disease (CAD).³ The CAD can occur in non-obese.⁴ Obese individuals.⁵ with high visceral fat even with low BMI.⁶⁻⁷ The present study was undertaken to elicit important risk factors for acute myocardial infarction (AMI).

MATERIALS AND METHODS

This prospective study was undertaken in tertiary referral and teaching hospital SKBZ/CMH Muzaffarabad and was approved by the institutional ethical committee. The verbal informed consent was obtained from all patients. Cases confirmed by electrocardiogram and diagnostic enzyme changes, were included. Patients with previous history of MI, stroke, heart disease, type 1 diabetes, and other comorbid illnesses were excluded. Hypertensive patients were defined as having persistent elevation of blood pressure ($\geq 140/90$ mmHg) or who were on anti-hypertensive drugs. Dyslipidemia was defined as hypercholesterolemia, hypertriglyceridemia and high low density lipoprotein (LDL) or patients who ever on

drugs to lower cholesterol.⁸ Diabetes in our dataset were only type 2 diabetes mellitus (DM)) and was defined as by preadmission history of diabetes mellitus or venous plasma glucose concentration of 7.0 mmol/l, after an overnight fast on at least two separate measurement and or 11.1 mmol/l two hour post prandially using the American Diabetes Association criteria.⁹ Smoking was defined as who smoked at least one cigarette/tobacco per day for preceding three months or more.¹⁰⁻¹¹ Demographic, clinical and laboratories characteristics were recorded in the proforma and entered. Data analysis was employed for all independent and dependent variables. Chi-square and Fishers exact test for categorical versus categorical and other data analysis were carried out to elicit relationship with risk factors by SPSS 20.

RESULTS

A total of 210 patients (male (M) = 163 and female (F) = 48) and mean age 56.2 ± 13.79 with their ages varying from 30 to >70 years were enrolled. In our dataset adults male and female both had significant association with AMI. Demographics distribution of risk factors among MI is shown in Table. The commonest risk factor for AMI was smoking 150 (71.4%) followed by hypercholesterolemia 118 (58.2%) and both are independent risk-factors for Acute coronary syndrome.

None had any medical checkup earlier. Isolated hypertension, family history of AMI and diabetes mellitus were statistical significant risks for AMI. The

statistical associations between different variables of AMI are shown in Table.

Table No.1: Characteristics of Acute Myocardial Infarction according to Demographics and Risk Factors

	Total	Anterior Myocardial infraction	Inferior & Posterior Myocardial Infraction	*P-value
N (%)	210	118 (56.2)	92(43.8)	
Age (year) mean age +-SD	56.30± 13.79			<0..001**
<30	5 (2.3)	2 (40.0)	3 (60.0)	.045**
30-39	17 (8.0)	10 (58.8)	7 (41.2)	
40-49	34(16.1)	20 (58.8)	14 (41.2)	
50-59	58 (27.6)	32 (55.1)	26 (44.8)	
60-69	64 (30.5)	35 (54.7)	29 (45.3)	
>70	32 (15.2)	19 (59.4)	13 (40.6)	
Risk factors				
Male	162 (77.1)	90 (55.6)	72 (44.4)	<0.001
Female	48 (45.9)	28 (58.3)	20 (41.7)	<0.001
Hypertension	63 (30.0)			.039*
Hypercholesterolemia	118 (56.2)			0.05**
Smoking	150 (71.4)			<0.05**
Diabetes	33 (15.7)			<0.001***
Family History	155 (73.8)			<0.001
Mortality	24 (11.4)	19 (69.2)	5 (20.8)	.05*

*Pearson Chi-square (two tailed); **Independent t test;***one sample test

DISCUSSION

This study aimed to analyze the risk factors for AMI in adults. This study revealed that smoking, diabetes, hypertension and dyslipidemia were found to be an independent risk factor for AMI as observed in previous studies.¹²⁻¹³ All forms of tobacco produce free radicals that deplete antioxidants and cause oxidative damage to DNA, proteins and lipids and risk for AMI.¹⁴ Diabetes type 2 was not only independent but also along with one or other risk factors were found to have an strong association with AMI. In diabetic patients 80% of deaths are attributable to CAD as result of dyslipidemia .Isolated hypertension and hypertension with one or other risk factors were significantly associated with AMI .Hypertension is in turn correlated with salt intake 8.5 grams/day, alcohol intake and obesity.¹⁵ Salt restriction reduces blood pressure at 6-12 months and weight reduction of 9 kg, can lower systolic blood pressure (SBP) by 6 mm Hg.¹⁶⁻¹⁷Dyslipidemia is widely accepted as risk factor for AMI. Dyslipidemia was independently associated as a significant risk factor (p=0.05) in our study. However dyslipidemia was also associated with one or other risk factors for AMI.¹⁸⁻¹⁹

CONCLUSION

Our results suggest that appropriate measures are needed for screening and awareness of putative risk factors of AMI in targeted population. In order to achieve such objective all clinicians should search routinely for risk factors among every case and counsel the identified victim. At the county level, reducing the burden of CAD will require continuous public education and focus on controlling common risk factors by early recognition of symptoms.

REFERENCES

1. Ôunpuu S, Negassa A, Yusuf S. For the INTER-HEART investigators. INTER-HEART: a global study of risk factors for acute myocardial infarction. Am Heart J 2001;141:711–21.
2. Lee KL, Woodlief LH, Topol EJ, et al. Predictors of 30 day mortality in the era of reperfusion for acute myocardial infarction: results from an international trial of 41021 patients. Circulation 1995; 91: 1659-68.
3. Hajian Tilaki K, Jalali F. Comparison of risk factor profiles in patients with acute myocardial infarction aged less or older than 45 years. Iranian Heart J 2006; 4(6):11-15.

4. Deurenberg-Yap M, Chew SK, Lin VF, Tan BY, van Staveren WA, Deurenberg P: Relationships between indices of obesity and its co-morbidities in multi-ethnic Singapore. *Int J Obes Relat Metab Disord* 2001;25:1554-1562.
5. Bhopal R, Hayes L, White M, Unwin N, Harland J, Ayis S, Alberti G. Ethnic and socio-economic inequalities in coronary heart disease, diabetes and risk factors in Europeans and South Asians. *J Public Health Med* 2002;24:95105.
6. Dudeja V, Misra A, Pandey RM, Devina G, Kumar G, Vikram NK. BMI does not accurately predict overweight in Asian Indians in northern India. *Br J Nutr* 2001;86:105-112.
7. Banerji MA, Faridi N, Atluri R, Chaiken RL, Lebovitz HE. Body composition, visceral fat, leptin, and insulin resistance in Asian Indian men. *J Clin Endocrinol Metab* 1999, 84:137-144.
8. Yusuf S, Hawken S, Ôunpuu S, et al. On behalf of the INTERHEART Study Investigators. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. *Lancet* 2004; 36:937-52.
9. American Diabetes Association. Diagnosis and Classification of diabetes mellitus *Diabetes Care* 2006, 29:S43-48. <http://statpages.org/#Comparison> webcite.2009.
10. Song YM, Cho HJ. Risk of stroke and myocardial infarction after reduction or cessation of cigarette smoking: a cohort study in Korean men. *Stroke* 2008; 39: 2432-38.
11. Smoking and exposure to environmental tobacco smoke decrease some plasma antioxidants and increase gamma-tocopherol in vivo after adjustment for dietary antioxidant intakes. *Am J Clin Nutr* 2003;77:160-166.
12. Ismail J, Jafar TH, Jafary FH, White F, Faruqi AM, Chaturvedi N. Risk factors for non-fatal myocardial infarction in young South Asian adults. *Heart* 2004;90:259-263.
13. Joshi P, Islam S, Pais P, Reddy S, Dorairaj P, Kazmi K, et al. Risk factors for early myocardial infarction in South Asians compared with individuals in other countries. *JAMA* 2007; 297:286-294.
14. Dietrich M, Block G, Norkus EP, Hudes M, Traber MG, Cross CE, et al. Smoking and exposure to environmental tobacco smoke decrease some plasma antioxidants and increase gamma-tocopherol in vivo after adjustment for dietary antioxidant intakes. *Am J Clin Nutr* 2003;77: 160-166.
15. Juutilainen A, Lehto S, Ronnema T, Pyorala K, Laakso M. Type 2 diabetes as a "coronary heart disease equivalent": an 18-year prospective population-based study in Finnish subjects. *Diabetes Care* 2005;28:2901-2907.
16. Radhika G, Sathya RM, Sudha V, Ganesan A, Mohan V: Dietary salt intake and hypertension in an urban south Indian population--[CURES - 53]. *J Assoc Physicians Ind* 2007;55:405-411.
17. Huang Z, Willett WC, Manson JE, Rosner B, Stampfer MJ, Speizer FE, et al. Body weight, weight change, and risk for hypertension in women. *Ann Intern Med* 1998;128:81-88.
18. Heart Protection Study Collaborative Group. MRC/BHF Heart Protection Study of cholesterol-lowering with simvastatin in 5963 people with diabetes: a randomized placebo-controlled trial. *Lancet* 2003;361: 2005-1.
19. Ryan TJ, Anderson JL, Antman EM, et al. ACC / AHA guidelines for the management of patients with acute myocardial infarction. A report of the American College of Cardiology / American Heart Association Task Force on Practice Guidelines (Committee on Management of Acute Myocardial Infarction). *J Am Coll Cardiol* 1996; 28:1328-428.

Address for Corresponding Author:**Dr. Javed Akhter Rathore,**Assistant Professor of Medicine AJK Medical College
Muzaffarabad A.KConsultant Physician & Head of Department of
Medicine & Supervisor FCPS Part-II Trainee Medicine-
Combined Military Hospital /Sheik Khalifa Bin Ziad
Hospital Muzaffarabad

Cell No.+92-355-8106847

Email: drjavedrathore111@yahoo.com