



RESEARCH ARTICLE

RISK FACTORS OF ISCHEMIC HEART DISEASE AND THEIR PREVALENCE IN ACUTE MYOCARDIAL INFARCTION

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ARTICLE INFO

Article History:

Received 05th June, 2017
Received in revised form
30th July, 2017
Accepted 27th August, 2017
Published online 30th September, 2017

Key words:

Coronary artery disease (CAD),
Risk factors,
Ischemic heart disease (IHD),
Acute Myocardial infarction (AcMI).

ABSTRACT

Coronary artery disease (CAD) the primary cause of disability and death worldwide is also one of the top five causes of death in India. For the past few decades as there is stupendous increase in coronary artery disease globally, identification of risk factors has become an essential prerequisite to bring down the incidence. The objective of this study was to assess the prevalence of various risk factors of Ischemic heart disease (IHD) in Acute Myocardial infarction (AcMI). A total of 50 patients admitted in the Cardiology department S.V.R.R. Government General Hospital, Tirupathi with evidence of acute myocardial infarction were included in this study. Conventional risk factors for IHD- hypertension, diabetes mellitus, dyslipidemia, smoking, obesity and family history of CAD were assessed. It was observed that male to female ratio was 2.13:1, hypertension-78%, dyslipidemia-72%, smoking-48%, family history of CAD-34%, obesity-12% and diabetes mellitus-20%. This study concludes that AcMI is significantly associated with conventional risk factors; early detection, life style modification and timely medication play a key role in reducing the burden of IHD. Hence awareness about the risk factors illustrates the enormous potential for prevention of AcMI.

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Citation: Sujatha, C., Helena Rajakumari, J., Koppurapu Srishna and Koppurapu Leshna, 2017. "Risk factors of Ischemic Heart Disease and their prevalence in Acute Myocardial Infarction", *International Journal of Current Research*, 9, (09), 57926-57928.

INTRODUCTION

Coronary artery disease (CAD) also known as Ischemic heart disease (IHD) (Roever and resend, 2015) is a group of diseases that include stable angina, myocardial infarction and sudden cardiac death (Wong., 2014; Cyril James, 2003). CAD has emerged as a major health problem globally and is a leading cause of death in developing countries including India (Desnandle et al., 2008; Cyril James, 2003). The global burden of diseases study estimates that by the year 2020 there would be 11% rise in cardiovascular deaths in India which would surpass that in any other region of the world (Desnandle et al., 2008; Akramretal, 2015). The conventional risk factors for CAD are broadly divided into modifiable and non-modifiable risk factors. The former include diabetes mellitus, hypertension, dyslipidemia, obesity and smoking while latter are age, sex and family history of CAD (Cyril James, 2003; Sekhri et al., 2014). The existence of traditional risk factors of IHD can result in early myocardial infarction. Many studies (Dabiran et al., 2015) have confirmed that about 90% of IHD occur in patients who have known risk factors, hence identification of risk factors is a necessity to bring down the incidence.

Aim

The aim of the study was to assess the prevalence of various risk factors of IHD in Acute myocardial infarction (AcMI).

MATERIALS AND METHODS

The study was conducted in S.V. Medical College and S.V.R.R. Government General Hospital, Tirupathi. AP. A total of 50 patients admitted in ICCU and diagnosed as AcMI were included in the study, patients having associated congenital or valvular heart disease were excluded. Detailed history was stressed upon

- Occupation,
- Socioeconomic status,
- Diabetes mellitus, hypertension, ischemic heart disease, smoking, alcohol consumption, personality, life style and
- H/o premature CAD or CVA in any of the first degree family members.

General examination included vitals, height, weight and systemic examination. Under aseptic precautions 5ml of fasting venous blood sample was collected and serum lipid profile was performed spectrophotometrically by following methods

- Total cholesterol - CHOD-POD method (Trinder and Clin path, 1969)
- HDL cholesterol – phosphotungstic acid method (Scoleoinic, 1970)
- Triglycerides – GPO/PAP method (Werner, 1981)
- LDL cholesterol – calculated by Friedewald's formula (Fried Ewald Wt *et al.*, 1972)

Dyslipidemia was defined when

- Total cholesterol ≥ 200 mg/dl,
- Triglycerides ≥ 150 mg/dl
- LDL cholesterol ≥ 100 mg/dl and
- HDL cholesterol ≤ 40 mg/dl.

And obesity by calculating body mass index (weight in Kg/Height in meter²)

RESULTS

A total of 50 acute MI cases were included in the study. There was male predominance (68%), male to female ratio being 2.13:1, 2(4%) cases were under the age of 35 yrs.8(16%) were in the age group of 35-44 yrs.18(36%) were in the age group of 45-54 yrs.13(26%) were between 55-64 yrs and 9(18%) were above 65 yrs.

Table 1. Incidence of Acute MI based on Age and Gender

S. No.	Age in Yrs.	Males (%)	Females (%)	Total (%)
1.	< 35	2 (4%)	--	2 (4%)
2.	35 - 44	7 (14%)	1 (2%)	8 (16%)
3.	45 - 54	10 (20%)	8 (16%)	18 (36%)
4.	55 - 64	8 (16%)	5 (10%)	13 (26%)
5.	>65	7 (14%)	2 (4%)	9 (18%)
	Total:	34(68%)	16(32%)	50

Incidence of acute MI was at its peak in the age group of 46-64 yrs. (60%) including both the sexes, whereas it was negligible in females below 45 yrs (8%). From the study it is evident that acute MI in males was precedent by a decade than females. Incidence in males (18%) was higher than females (2%) prior to 45 yrs. Whereas it was almost the same beyond 45 yrs, the male to female ratio being 1.3:1.

Table 2. Prevalence of risk factors in Acute MI

S.No.	Risk Factors	No. of cases	%
1.	Positive family H/o CAD	14	28
2.	Smoking	24	48
3.	Obesity (>30 BMI)	11	22
4.	H/o Hypertension	37	74
5.	H/o Diabetes mellitus	10	20

28% of cases had positive family H/o CAD, 48% were smokers, 22% were obese with BMI more than 30, 74% had H/o hypertension and 20% had H/o Diabetes mellitus.

Table 3. Prevalence of Dyslipidemia in Acute MI

S.No.	Type	Mean± SD	No. of Cases (%)
1.	Total Cholesterol (>200 mg/dl)	225.9 ± 59.53	36 (72%)
2.	HDL Cholesterol (< 40 mg/dl)	38 ± 14.02	18 (36%)
3.	Triglycerides (> 200 mg/dl)	223.5 ± 33.29	24 (48%)
4.	LDL Cholesterol (> 100 mg/dl)	116.3 ± 37.42	29 (58)

72% had hyper Cholesterolemia with mean ± SD 225.9 ± 59.53, 36 % had low HDL Cholesterol with mean ± SD 38.7 ± 14.02, 48% had hypertriglyceridemia with mean ± SD 223.5 ± 33.29 and 58% had elevated LDL Cholesterol with mean ± SD 116.3 ± 37.42.

DISCUSSION

Ischemic heart disease (IHD) is a significant contributor to morbidity and mortality globally (Roever and resend, 2015; Desnpandle *et al.*, 2008; Cyril James, 2013). Myocardial infarction a common presentation of ischemic heart disease is a focus of necrosis resulting from inadequate tissue perfusion owing to Coronary atherosclerosis (Ambrose *et al.*, 2015). The conventional risk factors play a major role towards development of IHD in both genders (Puja Mehta *et al.*, 2015). Given the growing burden of IHD it has become imperative to recognize the array of risk factors. From the study it was evident that in males acute MI started a decade prior to females with a high prevalence earlier to 45 yrs, (Cyril James, 2013) but it was almost similar in both the sexes after 45 yrs (Cyril James, 2013; Akramretal, 2015). Gender difference of MI is moderated by age and this is in part due to the weakening protective effect of estrogen on IHD after menopause (Dabiran *et al.*, 2015). Family history of MI is an independent prognostic indicator of increased IHD risk in both genders (Puja Mehta *et al.*, 2015), in our study 28% had positive family history of CAD, supported by similar studies (Akramretal, 2015; Kaur Jaspinder, 2014; Roneaglion, 1992). Tobacco increases IHD risk including progression of atherosclerosis, myocardial infection and sudden cardiac death (Puja Mehta *et al.*, 2015) in our study the prevalence of smoking was 48% which are consistent with other studies (Dabiran *et al.*, 2015; Wasir *et al.*, 1987). Elevated BMI is associated with increased risk of IHD. Distribution of fat implicates development of IHD. Independent of traditional measure of obesity excess visceral fat has a deleterious effect on CVD (Puja Mehta *et al.*, 2015) 22% of cases in our study have BMI more than 30, which is in correlation with other studies (Akramretal, 2015; KIVI mak, 2012) Hypertension, under diagnosed and under treated remains a major risk factor for IHD (Puja Mehta *et al.*, 2015) and it is truly "Silent Killer" (Desnpandle and Dixit, 2008). A high prevalence (74%) of hypertension was noted in the present study which is more than double that of other studies, (Desnpandle and Dixit, 2008; Cyril James, 2013; Akramretal, 2015) Indicating asignificant association to acute MI. Indians are genetically prone to develop type II diabetes mellitus due to insulin resistance. The hyperinsulinemia accelerates the atherosclerotic process in the coronary arteries (Cyril James, 2013) leading to acute MI. In the present study 20% of cases had diabetes mellitus which is consistent with other studies (Akramretal, 2015). Dyslipidemia is the greatest contributor for development of IHD worldwide (Puja Mehta *et al.*, 2015). Present study revealed evidence of dyslipidemia in 72% of cases which is in line with other reports (Cyril James, 2013; Akramretal, 2015).

Conclusion

AcMI the common presentation of IHD is a significant contributor to morbidity and mortality worldwide. Risk factors like hypertension, diabetes mellitus, dyslipidemia, smoking, obesity are modifiable. Early detection of these risk factors and by life style modification with timely treatment plays a key

role in reducing the burden of IHD. In the present study AcMI was significantly associated with conventional risk factors. So knowledge regarding those risk factors illustrates the enormous potential for prevention of acute myocardial infarction.

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