ORIGINAL ARTICLE

Frequency of Modifiable Risk Factors at the Time of Myocardial Infarction and at Twelve Months Follow Up

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ABSTRACT

Objective: To determine the frequency of modifiable risk factors for coronary disease at the time of first MI and after one year follow up.
Study design: Prospective study
Place and duration of study: Department of Cardiology and CCU Bahawal Victoria Hospital Bahawalpur from 1st August 2010 to 31st July 2012.
Methodology: In this study, 200 cases presenting with typical chest pain and either with suggestive changes on ECG or a specific rise in serum cardiac enzymes were enrolled. We recorded the demographic data including age, gender, weight, height and the other independent variables of the patients in a predefined proforma. The traditional cardiovascular risk factors (smoking, hypertension, diabetes mellitus, dyslipidemia, sedentary life style, obesity) were noted. All of these patients were kept on regular follow up and the data regarding the modifiable risk factors was again recorded after twelve months. Data was analyzed using SPSS version 10.
Results: Out of 1000 enrolled patients, 25% (n=250) didn't come for follow up. In the remaining 75% (n=750) of cases, 64% (n=480) were males with a mean age of presentation 57±07 years. Major documented modifiable risk factors at the time of acute myocardial infarction were diabetes mellitus (48%), hypertension (46%) and smoking (45%). At twelve months, frequency of poor glycemic control was found to be 18%. Non-affordability was the major issue (34% of patients) underlying the poor control over the disease and its associated risk factors.
Conclusion: Most of the patients on regular follow up can have a better control of modifiable risk factors of coronary artery disease. Lack of adherence with the treatment, non-affordability and lack of proper advice by the doctors are the identifiable etiologies in the patient group who were not having proper control of these risk factors.
Key words: MI, CAD, NSTEMI, STEMI

INTRODUCTION

Coronary artery disease (CAD) defines a disease spectrum of diverse aetiology and atherosclerotic plaque is its most common cause[1,2]. Myocardial infarction (MI) or heart attack is a grave outcome of coronary artery disease, when arteries become narrow or hardened due to cholesterol plaque build-up. Further narrowing may occur from thrombi or blood clots that form on the surfaces of plaques[3].

Ever since the Framingham heart study in 1960s identified the important risk factors associated with CAD, there has been a great stress to reduce the burden of cardiovascular disease (CVD) by modifying these risk factors. Modifiable risk factors include diabetes, smoking, hypertension, hyperlipidemia, sedentary life style, obesity, stress and depression. Non-modifiable factors are advancing age, male gender, family history of CAD, while menopause and personality type being partly modifiable. Newly emerging risk factors include increased levels of high-sensitivity C-reactive protein (hsCRP), homocysteine, lipoprotein (a), fibrinogen, D-dimers, Interleukin 6 and myeloperoxidases[4].

Cardiovascular risk factors for ischaemic heart disease and acute myocardial infarction are on the rise in Pakistan.[5] Dyslipidemias are being increasingly recognized as an important contributory factor towards the development of CVD.[6] The increasing rates of overweight and obesity pose a serious public health problem worldwide,[7] not only because of the association with the risks of cardiovascular disease, but also because of the association with human poverty status.[8-13]

METHODOLOGY

This was a prospective study which was conducted in our unit.. In this study, 1000 cases presenting with typical chest pain and either with suggestive changes on electrocardiography (ECG) or a specific rise in serum cardiac enzymes were enrolled from 1st

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August 2010 to 31st July 2011 and all these patients were followed up on completion of one year from the date of enrollment and this second phase of study continued from 1st August 2011 to 31st July 2012. The diagnosis was based on the definition of myocardial infarction as coined by the American College of Cardiology and the European Society of Cardiology which considers MI as a typical rise in cardiac troponin T or I, or Creatine kinase iso-enzyme B (CK-MB), above the 99th centile for normal, with at least one of the following; ischemic symptoms, development of pathological Q-waves on the ECG, ischemic ECG changes (ST-segment depression or elevation) or percutaneous coronary artery intervention e.g. PCI[14]. Patients presenting with all types of MI (including non ST-elevation MI, anterior, lateral, inferior and combination) were considered for enrollment.

Hypertension was defined according to the 7th Report of the U.S. Joint National Commission on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7), and was considered as systolic blood pressure ≥140 mmHg and diastolic blood pressure ≥90 mmHG[15].

A fasting glucose of greater than or equal to 7.0mmol/l or a two hour glucose value of greater than or equal to 11.1mmol/l was considered as diabetes[16].

Obesity was defined as body mass index (BMI) ≥30.00 kg/m^2.[16] Lipid abnormalities were defined according to the recommendations of National Cholesterol Education Program (NCEP) Adult Treatment Panel III[17].

We recorded the demographic data including age, gender, weight, height and the other independent variables of the patients in a predefined proforma. The traditional cardiovascular risk factors (smoking hypertension, diabetes mellitus, dyslipidemia, sedentary life style, obesity) were noted. All of these patients were kept on regular follow up and the data regarding the modifiable risk factors was again recorded after twelve months. Data was analyzed using Statistical Package for Social Sciences (SPSS) version 10.

RESULTS

Out of 1000 enrolled patients, 25% (n=250) didn't come for follow up. In the remaining 75% (n=750) of cases, 64% (n=480) were males with a mean age of presentation 57±07 years. Major documented modifiable risk factors at the time of acute myocardial infarction were diabetes mellitus (48%), hypertension (46%) and smoking (45%). Baseline characteristics of the patients are given in Table 1. At twelve months, frequency of poor glycemic control was found to be 18% (Table 2).. Major factors behind poor control of these modifiable risk factors for coronary artery disease in this patient group are shown in Fig.1.

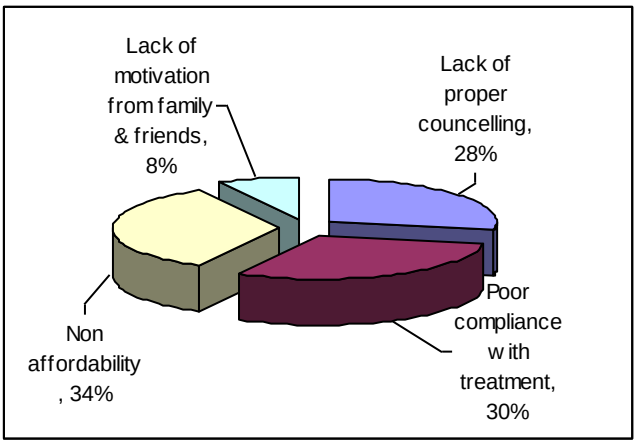
Table 1: Baseline characteristics

Variables	Males	Females
Mean age	57±07	64±05
Diabetes mellitus	26%	22%
Hypertension	25%	21%
Smoking	36%	09%
Dyslipidemias	12%	08%
Sedentary life style	14%	13%
NSTEMI	17%	12%
ST-segment elevation MI	33%	38%
Total	480	270

Table 2: Interaction between risk factors at the time of MI and at 12 months follow up

Variables	At the time of MI	At 12 months
Poor glycemic control	48%	18%
Hypertension	46%	22%
Smoking	45%	37%
Dyslipidemia	20%	06%
Sedentary life style	27%	24%

Fig 1: Factors behind poor control of disease and associated risk factors



DISCUSSION

Our study focused on the identification of modifiable risk factors for coronary artery disease in patients of acute MI, keeping such patients on medications tailored to the individual's need and then re-assessment of all those modifiable risk factors after twelve months follow-up. We recognized that poor compliance with the treatment and non-affordability are the factors behind poor control over these factors. Lack of proper counseling by the attending doctor at the time of discharge regarding the disease etiology, importance of adherence with the treatment and the hazards of not overcoming the modifiable risk factors of the disease also plays an important role. Death of

the patient, lack of easy accessibility to hospital and the persons living in remote areas were the reasons of drop out of patients from the study.

To improve the adherence and ensure the success of the treatment proposed, it is necessary that health professionals recognize adherence problems[18,19] and their predictors and aim to increase awareness about this fundamental aspect of treatment. A recent study that assessed medication adherence in patients with coronary artery disease demonstrated an adherence rate of 54% after one year of treatment and related education level, marital status, mental health (depression/anxiety) and total number of daily medications to low adherence[20].

Adherence problems can be improved by some interventions but patient involvement is essential with discussion of alternatives to improve adherence[18,21]. Use of technologic system is one strategy[22] but patient education is paramount with structured reminders[23] an increase in the number of consultations or telephone calls, and simplification of the medication regimen[18,24,25]. It was observed that prevalence of smoking in females was much less as compared to male patients. The underlying reasons may be social and cultural trends in this part of the country.

CONCLUSION

It can be inferred that most of the patients on regular follow up can have a better control of modifiable risk factors of coronary artery disease. Lack of adherence with the treatment, non-affordability and lack of proper advice by the doctors are the identifiable etiologies in the patient group who were not having proper control of these risk factors.

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