Original Article

Frequency of risk factors in Acute Coronary Syndrome

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ABSTRACT

Objective: To measure the frequency of risk factors in patients of ACS.
Study Design: Observational descriptive study
Place and Duration of study: It was conducted in the emergency department of Nishtar Hospital Multan from January 2008 to January 2009.
Patients and Methods: Consecutive 400 patients who presented with history of chest pain were enrolled in the study. These patients underwent clinical examination, ECG and Trop T testing. Patients were inquired about the risk factors by the help of a Proforma.
Results: STEMI was the most common diagnosis (66.7%). One or more risk factors were present in each patient; Hypertension (37.2%), Smoking history (50.1%), Diabetes Mellitus (29.2%), Family history (41.5%) and sedentary habits (33.2%).
Conclusion: Hypertension and smoking are most common risk factors in patients with ACS.
Keywords: Risk factors Acute Coronary SyndromeMyocardial Infarction

INTRODUCTION

Acute Coronary Syndrome (ACS) is a burden on health care system all over the world with 114,000 admissions annually in UK.[1] Chest pain is the most common symptom in patients presenting with ACS.[2]

The term "Acute Coronary Syndrome" covers the clinical spectrum of acute myocardial ischemia, including unstable angina (UA), acute myocardial infarction (MI) without ST- segment elevation (non-ST-segment elevation MI [NSTEMI]), and ST-segment elevation MI (STEMI).[3] STEMI deals with complete occlusion of coronary artery where as NSTEMI and unstable angina deal with incomplete occlusion of coronary artery.[4] In patients with UA, ST segment depression, transient ST segment elevation and /or T wave inversion occur in 30-50% of patients. Diagnosis of NSTEMI is made when patients with ischemic discomfort, without ST segment elevation on electrocardiogram (ECG), have raised serum cardiac biomarkers of necrosis. STEMI is defined when there is presence of ST segment elevation on ECG along with raised serum cardiac biomarkers of necrosis.[5]

The categories of ACS cannot be defined without the help of cardiac biomarkers (Troponin T and I). Cardiac Troponins are highly useful as markers of ACS and abnormal values at any time following chest pain onset are highly indicative of an adverse event.[6] As ECG is an integral part of initial evaluation in emergency and also being a cost effective investigation, every resident / physician should be well versed in its analysis and interpretation. All physicians should be familiar with risk stratification of patients with ACS.

Gencer B has devised a screening method which is used in initial evaluation without the use of complicated gadgets, with promising results and hence it can be adopted in our setup.[7] In this method, cardiovascular risk factors, pain characteristics, and physical signs associated with coronary heart disease were explored to develop a clinical score.

Several risk factors are identified for ACS. Modifiable being Hypertension (HTN), smoking, increased LDL cholesterol, Diabetes Mellitus (DM), Obesity, inactivity/sedentary mode of life, and non modifiable being age, male sex, family history and past history of Coronary Artery Disease (CAD).[8] The relationship between risk factors and ACS is well established.

Aim of this study was to measure the frequency of associated risk factors in patients with ACS. The results can be utilized in public awareness programs as an effort to show people the right direction in reducing the incidence of coronary artery disease and hence burden on the health care system.

PATIENTS AND METHODS

It was an observational descriptive study conducted in 2008-9 at Nishtar Hospital Multan. Patients presenting to emergency department with complaint of chest pain and age greater than 20 years were included in the study. Evaluation was based on the detailed history, focused physical examination and electrocardiography (ECG). Troponin T levels were measured after 6hrs of

start of chest pain. Excluded from the study were those who had other systemic illnesses or those transported by basic life support unit.

Patients in ACS group were enrolled in the study for evaluation of the risk factors. Data was collected by a self devised detailed Proforma containing information about demographics, presenting complaints, ECG findings, Troponin T value, any co-morbidity, history of smoking, Hypertension, Diabetes Mellitus, sedentary lifestyle and family history. Hyperlipidemia and obesity were not included in this study.

Data was entered and analyzed in SPSS version 15. Fischer's exact test was applied among categorical variables. Frequencies and percentages were calculated. P value of less than or equal to 0.05 was considered significant.

RESULTS

A total of 400 patients were enrolled in the study. Total number of patients diagnosed with ACS was 301(75.2%).

75.1% were male with mean age of 51.3 ± 6.2 years whereas mean age of female patients was 59.1 ± 9.1 years. One or more risk factors were present in all the patients; Hypertension 37.2% (n =112), smoking history 50.1% (n=151), Diabetes Mellitus 29.5% (n=89), Family history 41.5% (n=125) and sedentary habits 33.2% (n=100) [Table No. 1].

STEMI 66.7% (n=201) was the most common while NSTEMI 8.3% (n=25) was the least common diagnosis in ACS. 163 (81.1%) males and 38 (18.9%) females were affected by STEMI. 50 (66.7%) males and 25 (33.3%) females were affected with unstable angina while 13 (52%) males and 12 (48%) females were affected by NSTEMI [Table No. 2]. It was also found that greater number of males were affected as compared to females.

HTN was more common in males (89.3%, n=100) compared to females (10.7%, n=12), (P= 0.01). Positive smoking history was found in males (91.4%, n=138) as compared to females (8.6%, n=13), (P= 0.04). Presence of DM was not significantly different between males (57.3%, n=51) and females (42.7%, n=38), (P=0.06). [Table No. 3]

One striking point was that, patients with DM (48%) and HTN (48%) were more common in NSTEMI group as compared to STEMI and UA. Majority of patients with MI had anterior and inferior wall MI.

Table No. 1: Association of various risk factors with Acute Coronary Syndrome
Total No. of Patients n= 301

	Males	Females	Hypertension	Smoking History	Diabetes Mellitus	Family history	Sedentary habit
Numbers	226	75	112	151	89	125	100
Percentages	75.1%	24.9%	37.2%	50.1%	29.5%	41.5%	33.2%

Table No. 2: Distribution of important risk factors in three different entities of Acute Coronary Syndrome

	Male	Female	Hypertension	Diabetes Mellitus
STEMI (201)	163 (81.1%)	38 (18.9%)	88 (43.7%)	51 (25.3%)
NSTEMI (25)	13 (52%)	12 (48%)	12 (48%)	12 (48%)
UA (75)	50 (66.7%)	25 (33.3)	12 (16%)	25 (33.3)

Table No. 3: Distribution of various risk factors among males and females

Risk Factors	Males	Females	P Value
Hypertension (112)	100 (89.3%)	12 (10.7%)	0.01
Smoking history (151)	138 (91.4%)	13 (8.6%)	0.04
Diabetes Mellitus (89)	51 (57.3%)	38 (42.7%)	0.06

DISCUSSION

Coronary heart disease and in acute form, Acute Coronary Syndrome (ACS) is the number one cause of death world wide.[9] A number of risk factors are known to promote coronary artery disease (CAD). Some of these risk factors like age, gender, race and family history cannot be changed while other risk factors like, hypertension, hyperlipidemia, smoking, diabetes and sedentary life can be changed.

The first study in pursuit of risk factors associated with coronary artery disease was done by Keys et al and since then, numerous studies have been done.[10]

Age is a very important risk factor for ACS and its incidence increases with increasing age. In our study we have found that ACS was more common in fifth and sixth decade as mean age was 51.3 ± 6.2 for males and 59.1 ± 9.1 for females. In a study by Rosengren et al it was found that ACS was more common in old age (52% patients were between 55-84 yrs).[11]

ACS is more common in males than females. In our study 75.1% patients were males while in the study of Jafary et al 68% patients with ACS were males.[12] The result in our study that women experience first episode of ACS about 10 years later than men is consistent with the study of Anand et al who found that women experience first acute MI on average 9 years later than men.[13] It is because premenopausal women have a lower incidence of the disease than age and risk matched males.

Many studies have shown that family history (41.5% in our study) is indeed a risk factor in development of ACS. In a study by Burazeri et al[14], family history of coronary heart disease was found to be a strong predictor of acute coronary syndrome in both men and women. This is paving way in new discoveries in the emerging field of cardiovascular genetic medicine.[15]

In our study, among modifiable risk factors smoking (50.1%) was the leading risk factor in patients with ACS. This is similar to a study by Jafary et al in which frequency of smoking in ACS was found to be 52%.[12] In USA smoking causes 225000 deaths due to coronary heart disease. So smoking cessation counseling should be given to healthy subjects, adolescents and children. This will really cut down the burden due to smoking related diseases especially coronary heart disease on the health system of the country.[16] According to World Health Organization, one year after quitting, risk of CAD decreases by 50%. Pell et al found a 17% reduction in the number of hospital admissions for acute coronary syndrome after enactment of smoke-free legislation.[17]

Hypertension is a very important risk factor for ACS. In our study (37.2%) patients were hypertensive. This is similar to the study by Jafary et al[12] in which 55.2% patients of ACS had hypertension. Control of BP has been shown to prevent myocardial infarction. HOPE and EUROPA trials demonstrated that control of BP reduces fatal and non fatal vascular events.[18, 19]

Diabetes is the fastest growing public health problem both in developing and developed countries. Framingham Heart Study suggests that patients with diabetes mellitus have increased prevalence of ACS with adverse outcomes.[20] American heart Association has designated Diabetes mellitus as a major risk factor for ACS. In our study diabetes was found in 29.2% cases. Esteghamati et al found that MI was significantly higher in diabetic patients than in non diabetics (36.4% vs. 19.2%).[21] In many studies it has been found that improving glycemic control in diabetic patients decreases the incidence of cardiovascular events.[22] American Diabetic Association (ADA) has emphasized the importance of glycemic control in DM for risk modification.

Sedentary lifestyle (33.2% in our study) is a significant modifiable risk factor in cardiovascular disease morbidity and mortality as was found in the study of Burazeri G et al.[14] Removing this factor via exercise is an extremely effective, safe and inexpensive preventive modality.

Prevention is better than cure. To reduce the incidence of ACS efforts should be directed towards primary as well as secondary prevention like controlling hypertension, smoking cessation, decreasing cholesterol and exercise. In a study by Unal B et al, major benefit was achieved by smoking cessation and controlling hypertension.[23]

CONCLUSION

Hypertension, smoking history, diabetes mellitus, old age, male gender, family history and sedentary habits were the risk factors present in most of the patients with ACS. Incidence of ACS can be reduced by controlling the modifiable risk factors like, Hypertension, smoking, Diabetes mellitus and sedentary habits.

Mass media and public campaigns should be started to educate people about risk factors and should be told the ways regarding their prevention. In years to come if these preventive methods are adopted by the community, then incidence of ACS will surely decrease.

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