RISK FACTOR OF ISCHEMIC HEART DISEASE IN PATIENTS PRESENTING WITH ACUTE CORONARY SYNDROME TO A TERTIARY CARE HOSPITAL OF BALOCHISTAN

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Objective: Our study evaluates the most commonly implicated risk factors associated with Acute Coronary Syndrome (ACS) in Pakistani patients presenting to a tertiary care facility.

Methods: All patients presenting with ACS to Bolan Medical complex hospital (BMCH) Quetta over the 1 year period extending from November 2011 to November 2012 were included in this descriptive study. Patients were questioned for the presence or absence of conventional risk factors for coronary artery disease (CAD). Body Mass Index (MBI) and lipid profiles were also documented. Data was entered into SPSS version 10.0 to obtain descriptive statistics.

Results: Over 1 year, 200 patients conforming to the inclusion / exclusion criteria were included in this study. The male to female ratio was roughly 3:1. 30% of the patients were below the age of 50 years, and smoking was substantially more implicated in this population subset as compared to the rest of the study patients. Considering the term "Dyslipidemia" to encompass any one or more individual lipoprotein abnormalities and not merely elevation in total serum cholesterol, 90% of the patients were found to be dyslipidemic, most commonly on account of HDL less than 40 mg/dl (74%) or LDL more than 100mg/dl (70%) and elevated triglycerids (60%) BMI>25kg/m2 was present in 40% of the patients, and 20% were obese with BMI>30kg/m2. Males were more likely to be smokers and females were more likely to be diabetic and hypertensive. Three simultaneous risk factors (hypertension, diabetes mellitus and dyslipidemia) were present in 40% of the cases.

Conclusion: Traditional risk factors were present in all patients. Hypertension, dyslipidemia and elevated BMI were seen more frequently in this patient population. In addition, more than a third of the patients had more than three risk factors for CAD, an observation which has significant preventive management implications.

Key words: Acute coronary syndrome Prevalence, Risk factors, Preventive care.

INTRODUCTION

Ischemic heart disease is a preventable condition; this concept has revolutionized medicine over the past 60 years. To know the risk factors associated with this disease and to modify them, is now the standard of medical care all over the world.

Our objective was to evaluate how strongly implicated are the conventional risk factors with coronary artery disease in a Pakistani population. The identification of the top three risk factors will help us in the formulation of a national health policy aimed at creating awareness in the general public of how simple lifestyle modification might improve long-term health.

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Ever since the 1960's, when the Framingham Heart Study first identified smoking, hypercholesterolemia and hypertension as risk factors for ischemic heart disease,[1] scientists have been successfully reducing the burden of cardiovascular disease by modifying these factors in the 1970's.[1] Recently, newer risk factors, like (homocysteine, lipoprotein (a) are being evaluated in the Framingham population.

Numerous studies all over the world have validated the results of the historical Framingham study[4] and the risk factors inequitably associated with coronary artery disease are now published in all standard textbooks of Medicine and known to every physician (Table 1).

TABLE NO. 1: RISK FACTORS FOR ATHEROSELEROSIS[6]

Modifiable Risk Factors		Unmodifiable Risk Factors
By Lifestyle	By Pharmacotherapy and / or Lifestyle	
Smoking	Lipid Disorders	Age
Obesity	Hypertension	Male Gender
Physical Inactivity	Insulin Resistance	Genetics

Studies from Pakistan[9] have shown similar associations between these well-known risk factors and the risk of ischemic heart disease in our population. On reviewing recent local literature, it would appear that male gender, smoking and hypertension are most commonly identified in this regard.

Independent analysis of different subsets of the population may lead us to be more confident in identifying the predominant risk factors operational in Pakistani patients. In this regard, we present a descriptive study from a Tertiary Care Hospital of Balochistan where Medical facilities are limited.

METHODS

Patients presenting to Bolan Medical Complex Hospital, Quetta (BMCH) with diagnosis of ACS were included in this descriptive study.

ACS comprises ST-Elevation Myocardial Infarction (STEMI), Non ST-Elevation Myocardial Infarction (NSTEMI), and Unstable Angina Pectoris (UA)(10), which were defined according to standard criteria.

BMCH, Quetta is a tertiary care centre that specializes in the management of cardiovascular emergencies. Most patients presenting with ACS and admitted to the CCU via Emergency room.

On average, Twenty such cases present to the hospital over one month. A sample size of 200 was collected over the 1 year period extending from November 2011 to November 2012.

On the basis of convenience sampling: patients from all ages and both genders who presented with the diagnosis of ACS were included in the study. However, patients with additional confounding medical conditions (Respiratory failure, end stage renal disease, advanced congestive cardiac failure, major cerebrovascular accident, chronic autoimmune disease) were excluded from the study.

Data was collected on proforma by the medical officers in the CCU; the variables include were age, gender, admitting diagnosis, family history of premature coronary artery disease, diabetes mellitus, hypertension., smoking, lipid profile and body mass index. Fasting lipid profiles of all patients were performed within 24 hours of presentation at the hospital laboratory, Dyslipidemia was reported as any one or more of the following: HDL<40mg/dl, LDL>100mg/dl, TG>15 0mg/dl or total cholesterol > 200mg/dl.

Data was entered into SPSS v.10.0 and descriptive statistics were derived for each variable. Mean standard deviation has been reported for continuous variables and frequency and percentage for categorical variables. Chi-square test was used for comparison of proportions across a grouping variable such as gender and patients under the age of 50 years vs patients 50

years and above. The level of statistical significance was p<0.05.

RESULTS

Over 1 year, 200 patients conforming to the study criteria were included in our analysis. The mean age of the patients was 55.38 ± 12.65 years. 60 (30%) patients were below the age of 50 years, and 128 (64.0%) were male. The admission diagnosis was STEMI in 40 (20.0%), NSTEMI in 58 (28%) and UA in 116 (52.0%).

The frequencies of risk factors are given in table 2.

DISCUSSION

Our study yields both predictable and new findings, with implications for the formulation of a national plan that will focus on the risk factors more pertinent to our population. The male: female ratio is similar to that in international[1] and local studies.[6] As seen internationally, smoking is more operative in male[9] and diabetes is more common in females.[1] Of interest is the significantly higher frequency of diabetes and hypertension as risk factors for acute coronary syndrome in females, as these are not gender-specific in studies from other parts of the world.[10]

TABLE NO. 2: DESCRIPTIVE STATISTICS OF THE STUDY PARTICIPANTS: (n=200)

Risk Factor	Frequency	Percentage
Family History of Premature Coronary Artery Disease	40	20.0%
Hypertension	120	60.0%
Smoking	50	25.0%
Diabetes Mellitus	60	30%
Dyslipidemia	180	90.0%
HDL<40mg/dL	148	74.0%
LDL>100mg/dL	140	70.0%
TAG>150mg/dL	120	60.0%
BMI >25kg/1112 (overweight)	80	40.0%
BMI>30kg/m2 (obese	40	20.0%

As shown in Table No. 3, a combination of hypertension, dyslipidaemia and BMI >25 was prevalent in 41% of the cases combination of hypertension and BMI >25 in 42% cases and a combination of hypertension, diabetes and dyslipidemia in 27% of cases.

Patients presenting with ACS below the age of 50 years were more likely to be smokers and male (in comparison to rest of the study population), although the later association was not significant. More females were diabetic (59% females vs. 28% males p=0.01), and hypertensive (77.3% females vs 54.7% males. p=0.06), whereas more males were current smokers 34.4% males vs. 0% females, p=0.000).

Significant correlations between diabetes mellitus hypertension and dyslipidemia were expected.[11] A high LDL values of more than 100mg/dl was seen in 70.0% of cases, HDL less than 40mg/dl in 74% and triglycerides greater than 150 mg/dl was seen in 60.0% cases, with no significant correlation between these two forms of

TABLE NO. 3: DESCRIPTIVE STATISTICS OF COMBINATION OF RISK FACTORS: (n=200)

Combinations of Risk Factors	Percentage
Hypertension, Diabetes Mellitus, Smoking, Dyslipidemia and BMI >25	5%
Hypertension, dyslipidaemia and BMI >25	41%
Hypertension, diabetes mellitus and dyslipidaemia	27%
Hypertension, smoking and dyslipidaemia	12%
Hypertension, diabetes mellitus and smoking	5%
Hypertension, smoking and BMI >25	6%
Hypertension and BMI >25	42%
Hypertension and diabetes	27%
Diabetes mellitus and BMI > 25	24%
Hypertension and smoking	12%
Diabetes mellitus and smoking	9%

dyslipidemia. An elevated triglyceride level as a risk factor independent of any association with low HDL and high LDL has also been seen in larger trials and a meta-analysis previously.[7] Low HDL has been identified as a major risk factor in previous local studies as well.[19] The three most common risk factors for coronary artery disease in our population are dyslipidemia (low HDL elevated LDL elevated triglycerides), hypertension and BMI >25. More than a third of patients had a combination of three risk factors. This conclusion has important implications in the formulation of our future health policy.

Table 4 summarizes some of the national studies looking at risk factors for CAD which shows that a major risk factors (Hypertension, dyslipidemia, smoking & family history) are prevalent all over Pakistan. Dyslipidemia is modifiable both by lifestyle alterations and pharmacotheraphy.[14] In Pakistan, general awareness of the hazards of cholesterol-rich food is low. Additionally, station treatment is prohibitively expensive for most of the population. Since modification of the lipid profile has proven to be very rewarding in halting the progression of heart disease[15] it is hoped that steps are taken to educate the public on a large scale in this regard, and to make necessary drugs readily available.

The use of antihypertensives has also been proven to be effective in halting the progression of coronary artery disease, but perhaps not as ddramatically as lipid lowering therapy.[16] Lipid profiles are not done free of cost and statins are not available at most government hospitals, whereas antihypertensives are readily available in most areas of the country and blood pressure monitoring is done in all government hospitals.

More rewarding than either blood pressure or lipid control in the reversal of heart disease risk is, smoking cessation. The incidence of MI is increased six fold in women and three fold in men who smoke > 20 cigarettes per day compared to subjects who never smoked.[17] On the other hand,

TABLE 4: SUMMARY OF SOME NATIONAL STUDIES LOOKING AT RISK FACTORS FOR CAD

City	Institution	Sample size	Population Studied	Most implicated risk factors	Reference
Karachi	The Aga Khan University. Karachi	110	Patients presenting with Acute Coronary Syndrome	1. Male Gender 2. Hypertension 3. Smoking	Pakistan.1 Cardio Jun 2003:14(2): 61-8
Islamabad	Pakistan Institute of Medical Sciences., Islamabad	1000	Patients with diagnosed IHD	1 % Male Gender 2. Smoking	Pak Armed Forces Med J Jun 2003;53(1): 12-9
Lahore	Pun % jab Institute of Cardiology, Lahore	2495	Patients with established IHD presenting for angiography	1.Raised Serum Cholesterol and LDL 2.Smoking	Pakistan.1 Cardiol Dec 1999:1 10(4); 15-20
Faisalabad	Medical Unit-II, Allied Hospital Faisalabad	65	Consecutive patients presenting with IHD	1.Male gender 2.Smoking 3.Sedentary lifestyle	Professional Med J Jun 1996;3(2):151-9
Rawalpindi	Armed Forces Institute of Card Cardiology/ National Institute of Heart Diease (AFIC / NIHD), Rawalpindi	500	Male Army officer (250) and civilians (250) presenting with IHD	1.Smoking 2.family history	Pak Armed Forces Med J Dec 2003:53(2): 202-7

the risk or recurrent infarction falls by 50 percent within one year of smoking cessation, and normalizes to that of nonsmokers within two years. The benefits of smoking cessation are seen regardless of how long or how much the patient has previously were below the age of 50 years, and smoking was the only risk factor significantly greater in this population subset. Is the Pakistani youth aware of the hazards of smoking, and if they continue to smoke regardless of this knowledge, what can be done to reverse this trend.

CONCLUSIONS

The most common risk factors in patients presenting to our facility with Acute Coronary Syndrome are dyslipidemia, hypertension and BMI > 25kg/m2. A substantial proportion of patients are below the age of 50 years, and smoking is more common in this age group. All four of the risk factors mentioned are modifiable. If we hope to reverse the burden of cardiovascular disease in our population, all concerted efforts should be made to decrease the prevalence of these risks.

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