Original Research Article

A PROSPECTIVE STUDY ON THE RISK FACTORS, ANGIOGRAPHIC SEVERITY AND THEIR CORRELATION WITH STEMI AND NSTEMI IN PATIENTS WITH ACUTE CORONARY SYNDROME

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Abstract: Cardiovascular diseases are the leading cause of death globally; representing 30% of all global death. Coronary artery disease has assumed epidemic proportions in India. Several modifiable and non modifiable risk factors have been documented in Indian population. The aim of work is to study about the risk factors, angiographic severity and their correlation with segment elevated myocardial infarction (STEMI) and Non ST segment elevated myocardial infarction (NSTEMI) in patients with acute coronary syndrome (ACS). A prospective study was carried out to identify the risk factors angiographic severity in acute coronary syndrome including S T elevation and non S T elevation myocardial infarction. Patients meeting the inclusion criteria were studied with detailed history and investigation along with angiographic assessment of coronary lesions. This study showed a significant male predominance. Patients with STEMI were slightly younger at presentation than those with NSTEMI. Hypertension and dyslipidemic were seen to be significantly higher amongst NSTEMI subjects compared to STEMI subjects. Regarding angiographic severity single vessel disease was more associated with STEMI and mild Cardio vascular disorders (CVD) was more associated with NSTEMI that was found to be statistically significant. Double vessel diseases are more associated with STEMI and triple vessel disease more associated with NSTEMI but, they were not significant statistically.

Key Words: Acute Coronary Syndrome; Risk Factors

Introduction: Cardiovascular diseases (CVD) are currently the leading cause of death in industrialized countries and are expected to become so in emerging countries by 2020.

Among these, coronary artery disease (CAD) is the most prevalent manifestation and is associated with high mortality and morbidity.[1] Coronary Artery Disease (CAD) was the number one condition causing death globally. 17.5 million People died from CAD in 2005, representing 30 percentages of all global deaths. Over 80 percentage of CAD deaths occurred in low and middle income countries.[2] World Health Organization (WHO) indicates that

cardiovascular disease accounts for half the mortality among Non communicable disease, which constitutes 53 % of mortality in India.[3] Ischemic heart disease is becoming a more common cause of death in the developing world. It says that, in India, ischemic heart disease was the main cause of death in 2004 accounting for 1.46 million deaths (14% of total deaths) and deaths due to ischemic heart disease were expected to double during 1985–2015.[4] In Kerala 20 percentage of deaths were caused by CAD in each year. The age adjusted CAD mortality rates per 100,000 were 382 for men and 128 for women in Kerala. These CAD rates in Kerala were higher than those of industrialized countries and three to six times higher than Japanese and rural Chinese. CAD in Kerala was premature and malignant resulting in death at a very young age. Approximately 60 percentages of CAD deaths in men and 40 percentages of CAD deaths in women occur before the age of 65 year.[5] Acute coronary syndromes (ACS) encompass a wide range of clinical disorders that share a common physiologic derangement: an acute or sub acute imbalance between the oxygen demand and supply of the myocardium.[6,7] The symptoms and eventual diagnosis of a patient presenting with an ACS are dependent on the duration and degree of inadequate oxygenation, making the diagnosis challenging.[8] The term acute coronary syndromes are used to collectively describe acute myocardial infarction (heart attack) and unstable angina (chest pain occurring at rest, new onset of pain with exertion, or angina that is more frequent, longer in duration or lower in threshold than before)[9].Acute myocardial infarction or heart attack occurs when a plaque within one of the coronary arteries rupture and forms a clot that completely blocks blood flow to the heart muscle (myocardium).Angina occurs when plaque or blood clot only results in narrowing the blood vessel, and may happen as a precursor to a heart attack or remain stable for long periods[10]. Based on this information, the work was focused on the risk factors, angiographic severity and their correlation with segment elevated myocardial infarction (STEMI) and Non ST segment elevated myocardial infarction

(NSTEMI) in patients with acute coronary syndrome (ACS).

Materials

Study Design

It is a prospective observational study. In the present study the population consists of patients diagnosed with Acute Coronary Syndrome (ACS), admitting to the Emergency Department of a tertiary care hospital. The sample size of the study was 125 which included the patients were admitted in the hospital with ACS. Patient demographics, prescribed medication, laboratory data's, co-morbidities and treatment outcome also collected from patient medical records.

Data Collection:

Using a data entry format detailed history and physical examination of all patients were collected. Assessment of risk factors including Hypertension, diabetes, smoking, family history of CAD, prior angina, prior aspirin use and high BMI was done. Case sheets of the patients were thoroughly reviewed and necessary data noted down. Data processing was carried out.

Inclusion Criteria

Patients within the age group of 40-75 yrs, both men and women, with acute coronary syndrome were included in the study. All patients who visit emergency department with classical chest pain, ECG changes suggestive of acute coronary syndromes and patients of acute myocardial infarction presenting within 6 hours of the onset of chest pain and showing positive ECG changes were also included in the study. In addition, Adult patients with UA or NSTEMI and co morbid diseases were included in the study.

Exclusion Criteria

Those cases with proven non- cardiac chest pain and those who were discharged before completion of the treatment for any reason were excluded from the analysis. Patients with renal or hepatic failure were excluded. Patients in the status of post renal transplant, pregnant women, brain ischemia and sepsis were excluded in the study.

Statistical Analysis

Statistical analysis was done using Statistical Package for Social Sciences (SPSS 19.0) and Microsoft Excel 2010 Version. Association

between cardiovascular risk, angiographic severity with STEMI and NSTEMI was carried out using Pearson Chi square test. A probability value (p-value) of < 0.05 was considered as statistically significant.

Results and Discussion

Table 1 revealed that among 125 patients, 61.6% (n=77) were NSTEMI patients and 38.4% (n=48) were STEMI patients. Among 92 male patients 43.2% (n=54) were NSTEMI patients and 30.4% (n=38) were STEMI patients. Among 33 female patients 18.4 (n=23) were NSTEMI patients and 8% (n=10) were STEMI patients. Table 2 revealed that Out of 125 patients, 53.6% were hypertensive's, 49.6% were DM, 24.8% were smokers, 22.4% had

family history of ACS, 20% were dyslipidemic, 19.2% had prior angina, 12.8% were high BMI and 13% patients had prior aspirin use. It was found that DM and HT were the most common risk factor found in both STEMI and NSTEMI patients. According to the study findings there were 35.2% (n=44) of participants having single vessel disease. 22.4 % (n=28) of participants were having double vessel disease, followed by triple vessel disease in 18.4% (n=23).16% (n=20) of participants were having the moderate disease. While 5.6% (n=7) of participants were having mild disease. 2.4% (n=3) of participants were having the normal angiogram shown in Table 3.

Table 1: Percentage Distribution of population according their Type of disease

Type of Disease	No. of Patients (N=125)	Percentage of Patients
NSTEMI	77	61.6
STEMI	48	38.4

Table 2: Distribution of male & female patient in STEMI and NSTEMI group

SEX	TYPE				TOTAL	PERCENTAGE (%)
	NSTEMI	PERCENTAGE (%)	STEMI	PERCENTAGE (%)		
Female	23	18.4	10	8	33	26
Male	54	43.2	38	30.4	92	73
Total	77	61.6	48	38.4	125	100

Table 3: Prevalence of risk factors based upon the type of syndrome

RISK FACTORS	TYPE				TOTAL	PERCE-NTAGE (%)
	NSTEMI	(%)	STEMI	(%)		
Hypertension	47	37.6	20	16	67	53.6
Smoking	16	12.8	15	12	31	24.8
High BMI	8	6.4	8	6.4	16	12.8
Diabetes Mellitus	39	31.2	23	18.4	62	49.6
Hyperlipidemia	20	16	5	4	25	20
Aspirin Use	6	4.8	8	6.4	13	10.4
Prior Angina	16	12.8	8	6.4	24	19.2
Family History	15	12.0	13	10.4	28	22.4

Table 4: **Prevalence of Risk Factors and Angiographic Severity CAD in Patients with STEMI and UA/NSTEMI**

Sl.No	Risk Factors		NSTEMI (N=77)	STEMI (N=48)	Chi squre value	Table value	Inference
1	Mean Age		63.42 Sd=11.0	59.57 Sd=11.1			
2	Hypertension		47	20	5.296	3.841	S*
3	Diabetes Mellitus		39	23	0.223	3.841	NS
4	Dyslipedimea		20	5	4.834	3.841	S*
5	Smoking		16	15	1.460	3.841	NS
6	High BMI		8	8	0.898	3.841	NS
7	Prior aspirin use		6	7	1.306	3.841	NS
8	Prior Angina		16	8	0.429	3.841	NS
9	Family History		15	13	0.791	3.841	NS
10	Angiographic Severity	Normal	3	0	1.982	3.841	NS
		Mild	7	0	4.781	3.841	S*
		Moderate	14	6	0.846	3.841	NS
		Single vessel	18	26	11.27	3.841	S*
		Double vessel	16	12	0.202	3.841	NS
		Triple vessel	18	5	3.606	3.841	NS

Correlations between various risk factors and angiographic severity with STEMI and NSTEMI patients were given in Table 4. Mean age of subjects with STEMI was 59.57 (+-) 11.28 as compared to 63.42 (+-) 11.01 years amongst NSTEMI. Hypertension, dislipedemia were seen to be significantly higher amongst NSTEMI subjects compared to STEMI subjects. No association with DM, Smoking, high BMI, prior Aspirin, prior Angina and family history was seen. Regarding angiographic severity single vessel disease was more associated with STEMI and mild CAD was more associated with NSTEMI that was found to be statistically significant. Double vessel diseases are more associated with STEMI and triple vessel disease more associated with NSTEMI but, they were not significant statistically.

Conclusion

Majority of risk factors that are associated with coronary artery disease are Hypertension, and Diabetes Mellitus. These are the most common risk factors significantly associated with females and those presenting with NSTEMI, whereas smoking was the most predominant risk factor in males with STEMI. Mean age of the subjects presenting with STEMI were found to be higher than those presenting with UA/NSTEMI. Incidence of single vessel disease was significantly higher compared to double vessel disease. No significant difference was found in the prevalence of dyslipedimia, prior aspirin use, prior angina and family history between two genders and those presenting with STEMI/NSTEMI. Single vessel disease most frequently found in STEMI patients was statistically significant also. This study has explored the relationship between various risk factors, angiographic severity of patient with Coronary Artery Disease (CAD). The risk factors for the development of ACS were identified by the study. This data can be utilized for proper management of condition, helps in

clinical decision making, and also in providing proper pharmaceutical care to the patients.

Acknowledgement

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