A STUDY ON CLINICAL PROFILE OF RISK FACTORS OF CORONARY ARTERY DISEASE AS FIRST MANIFESTATION IN WOMEN WITH ACUTE CORONARY SYNDROME

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ABSTRACT
BACKGROUND
In this study, we wanted to evaluate the clinical profile of risk factors of coronary artery disease as first manifestation in women with acute coronary syndrome (ACS)

METHODS
This is a hospital based prospective observational study conducted among 100 female patients who presented with acute first myocardial infarction to the Department of Medicine of ACSR Government Medical College, Nellore, Andhra Pradesh, in a period of 18 months after obtaining clearance from Institutional Ethics Committee and written informed consent from the study participants.

RESULTS
The average BMI was 27.9 +/- 3.23 kg/m2 in the study population. 72 (72 %) had STEMI, 18 (18 %) were NSTEMI and 10 (10 %) were diagnosed as UA. In 6 (5.6 percent) of the patients, ECHO revealed moderate MR, and all of them had STEMI. Mild MR is found in 22 (22%) of the individuals. The average ejection percentage was 47 %.

CONCLUSION

Diabetes mellitus (DM), hypertension (HTN), dyslipidaemia, obesity and physical inactivity, as well as a family history of coronary artery disease (CAD), are common risk factors in the research population. Patient features such as advanced age, STEMI diagnosis, late presentation, and higher Killip's class and TIMI risk scores were found to be linked with significant morbidity and mortality.

KEYWORDS

Risk Factors, Coronary Artery Disease, Manifestation, Women, ACS

INTRODUCTION

When women arrive with AMI, they are often older, with a mean age of 71.8 years related to 65 years for men. Various studies have recently found a progress in the prevalance of CAD and mortality among women aged 45 to 54. Because of many co-morbidities (e.g., diabetes, hypertension, heart failure,). During the time of presentation with AMI, Asian Indian women had an increased relative mortality burden from CAD than non-Hispanic white women, especially at a younger age.

Certain risk factors, such as tobacco use, type 2 diabetes, depression and psychological factors are more potent in women. "The INTERHEART study" found that nine potentially modifiable risk factors (smoking, high blood pressure, diabetes, waist-hip ratio, dietary patterns, physical inactivity, alcohol consumption, plasma apolipoproteins and psychosocial factors) account for ninety six percent of the population have attributable risk of AMI in women. Women are more likely than men to have high-risk individual presentations and decreased experience to central chest pain. Females are underserved by guideline-based recommendations, resulting in poorer outcomes and increased rates of readmission, and death in the one year after a heart attack.

Aims and Objectives

1. To study clinical profile of risk factors and extent of CAD in women who have acute coronary syndrome.
2. To assess the course and outcome of therapy in females with acute coronary syndrome while they are in the hospital.

METHODS

This was a hospital based prospective observational study conducted among 100 female patients who presented with acute first myocardial infarction to the Department of Medicine of ACSR Government Medical College, Nellore, Andhra Pradesh in a period of 18 months after obtaining clearance from Institutional Ethics Committee and written informed consent from the study participants.

Inclusion Criteria

1. Within 5 days of presentation, female patients with ACS symptoms.
2. Women who are at least 18 years of age and presenting for the first time with ACS.
3. Women who are willing and able to provide written, informed permission

Exclusion Criteria

1. Women who have had heart failure or IHD in the past.
2. Cardiomyopathy or RHD patients were not enrolled in the study.

Statistical Methods

For all the population, we have calculated the variables (age, clinical presentation, time to presentation etc.) based on ACS findings Viz. STEMI, NSTEMI and UA. The data was entered in Microsoft excel 7.0 and transferred to Statistical Package for Social Sciences (SPSS) statistical software package ver. 18.0. Percent population was used to summarize the data.

RESULTS

Table No.-01
Risk Factor Distribution in ACS Subtypes

	Overall	UA	NSTEMI	STEMI
HTN	70 (70 %)	6 (60 %)	16 (88.8 %)	48 (66.6 %)
DM	58 (58 %)	4 (40 %)	10 (57 %)	44 (60.6 %)
Obesity	34 (34 %)	2 (20 %)	4 (22.2 %)	28 (38.8 %)
Physical inactivity	38 (38 %)	4 (40 %)	8 (44.1 %)	26 (36.4 %)
Tobacco abuse	6 (4.3 %)	-	4 (22.2 %)	2 (4.1 %)
CVA/PVD	2 (3 %)	-	-	2 (7 %)
Family history	28 (30 %)	2 (20 %)	4 (6.7 %)	22 (33.3 %)

Table No.-02
Lipid Abnormalities in ACS Subtypes

	OVERALL	UA	NSTEMI	STEMI
Total TG (mg/dl)	194.6	213	195	194
LDLc (mg/dl)	158.2	152	137	165
HDLc (mg/dl)	40.2	39.7	40.8	39
Total cholesterol(mg/dl)	201.4	205	188	204

Table No.-03
TIMI Risk Scores in ACS Subtypes

	Overall	UA	NSTEMI	STEMI
TIMI Score	5	3 (SD +/-1)	4.3 (SD +/-1.4)	5.2 (SD +/-2)

The average BMI was 27.9 +/- 3.23 kg/m2 in the study population. Figure 7: BMI categories in women. 72 (72 %) had STEMI, 18 (18 %) were NSTEMI and 10 (10 %) were diagnosed as UA.

In 6 (5.6 percent) of the patients, ECHO revealed moderate MR, and all of them had STEMI. Mild MR is found in 22 (22 %) of the individuals. The average ejection percentage was 47 %.

Table No.- 04
Coronary Angiogram Findings in ACS Subtypes

Findings	Total	UA	NSTEMI	STEMI
Single vessel disease	44 (44.0)	4	4	36
2 vessel disease	26 (26 %)	2	4	20
Triple vessel disease	26 (26 %)	-	10	16
IMCA disease	8 (6.3 %)	-	4	4
Normal/mild disease	4 (4 %)	4	-	-

Table No.-05
Use of Anticoagulants in ACS Subtypes

	OVERALL	UA	NSTEMI	STEMI
LMWH	58 (58.3 %)	6	14	38
UFH	30 (33.6 %)	-	2	28

Table No.- 06
Elective Revascularisation Procedures in ACS Subtypes

Revascularisation	Overall	UA	NSTEMI	STEMI
Single vessel PCI	26 (26 %)	4	4	18
2 vessel PCI	20 (20 %)	2	4	14
Multivessel PCI	14 (14 %)	-	4	10
CABG	12 (12 %)	-	6	6

A coronary angiography was performed in 100 (100 %) patients. Aspirin was given to all 100 study participants at doses ranging from 75 mg to 325 mg. In addition, all 100 trial participants were given high-dose statins (atorvastatin 40 mg / 80 mg or rosuvastatin 20 mg / 40 mg).

In 96 individuals, a second anti-platelet was used. Clopidogrel was utilised in 40 (42 %) of the study population, prasugrel in 18 (18 %), and ticagrelor in 38 (39 %) of the research population. Of the 72 STEMI patients, 54 were candidates for primary revascularization.

40 patients (55.3 %) received either thrombolysis or primary PCI. Out of the 100 women, 72 patients received elective revascularisation. Majority underwent PCI 60 (60 %), while 12 (12 %) patients had CABG surgery.

Table No.-07
Echocardiography Findings in ACS Subtypes

Type of ACS		Total	Percentage
UA		10	10
NSTEMI		18	18
STEMI		72	72
Type of Acute Coronary Syndrome			
	UA	NSTEMI	STEMI

LVEF (%)	59.1 (SD +/-1.8)	57(SD +/-3)	45 (SD +/- 6)
Mild MR	-	8	14
Moderate MR	-	-	6
VSR	-	-	-

Out of these 72 (72 %) had STEMI, 18 (18 %) were NSTEMI and 10 (10 %) were diagnosed as UA.

In 6 (5.6 percent) of the patients, ECHO revealed moderate MR, and all of them had STEMI. Mild MR is found in 22 (22 %) of the individuals. The average ejection percentage was 47 %.

Table 08
Complications in ACS Subtypes

	Overall	UA	NSTEMI	STEMI
CCF/LVF	14 (13.9 %)	2	4	8
Hypotension	4 (4 %)	-	-	4
Cardiogenic shock	2 (2 %)	-	--	2
Free wall rupture	-	-	-	-
CHB	6 (5.3 %)	-	-	6
Ventricular tachycardia	2 (2 %)	-	-	2
AKI	8 (8 %)	2	2	4
PV bleeding	-	-	-	-
Contrast-induced nephropathy	2 (2 %)	-	-	2
Intracranial bleeding	-	-	-	-
In-hospital death	4 (4 %)	-	-	4

4 (4 %) patients in the study died. Both ladies were in their sixties, with an age of 71. STEMI was present in both individuals.

Both patients had diabetes, and hypertension, and one of these patients was obese. Killip's class was > 3 in each of these patients, and TIMI risk score was > 9. Both were subjected to coronary angiography. Two patients had TVD, while the other two has DVD with LMCA. Primary PCI was performed on two individuals.

One of the patients experienced ventricular tachycardia, while the other had total heart block, necessitating use of a temporary pacemaker. Two of the four patients died secondary to cardiogenic shock, while the other two died with other causes.

DISCUSSION
Clinical Presentation

42 (84 percent) patients with all ACS subtypes reported with chest discomfort. Thirty-one (62 %) of these patients came with usual chest pain, while 11 (22 %) presented with atypical chest pain. In six (16.0 %) patients, chest discomfort was absent.

According to Canto et al [1] 7.42 percent of females arrived without the usual 126 chest pain, and the sex-specific difference in MI presentation without chest discomfort declined with age. In hospital, women died at the rate of 14.6 percent, while males died at the rate of 10.3 percent. With increasing age, these gender disparities declined or even reversed,

with adjusted odds ratios of 0.91 (95 percent CI, 0.88 - 095) for 65 - 74 years and 0.81 for 75 years and older. Both patients who died in our study experienced typical chest pain.

In our study, dyspnoea was the presenting complaint in 16 (32 %) participants, with four of them experiencing only dyspnoea and no chest discomfort. Perspiration was also recorded in 13 (26 %) patients, palpitations in two (4 %) cases, syncope in two (4 %) cases, and vomiting in one case (2 percent).

Time to Presentation

The average time from symptoms onset to FMC was 24 hours. In STEMI group, patients who came within 12 hours were 54 (75 %) and 18 (25 %) patients arrived 12 hours after symptom onset.

A comparable study, Veenananjappa et al [2] discovered that 16.7 % of women in the NSTEMI group arrived within four hours of symptom onset and 58.3 % presented greater than 12 hours later; 18.1 percent of STEMI patients arrived within four hours of symptom onset and 38.6 % patients 12 hours later. 64.3 percent of patients in the UA group presented 12 hours after the onset of symptoms.

Young girls who received reperfusion therapy were more common than young males to present > 6 hours after symptom start (35 percent versus 23 percent; P = 0.002) in the VIRGO
Trial [3]

In our study, the average time from symptom onset to first medical contact was 24 hours. This delay contributes to adverse outcomes in women. This delay is due to lack of awareness of risk, passivity, inaccurate symptom and self-care.

Risk Factor Profile

The proportion of patients with DM (55.5 % in NSTEMI, 61.1 % STEMI, 40 % in UA) was greater in both CREATE registry [4] (30.4 %) and INTER HEART study (30.5%) [5]

When compared CREATE registry (37.7%) [4] and INTER HEART study (29.6 %), the percentage of hypertensives was likewise high.

Obese people and sedentary lifestyle is the third most common risk factor. The average BMI was 28.9 +/- 3.23 kg/m2. About 65.33 percent patients had a BMI of 25 to 30 kg/m2, and
28.66 percent of patients were obese (i.e., BMI > 30 kg/m2).

Physical inactivity was seen in 18 patients (18 %). Physical inactivity is linked to elevated blood pressure, elevated cholesterol, impaired glucose metabolism, poor mental health, and obesity. Beyond leisure-time physical activity, physical inactivity, as measured by a prolonged sitting time, is an independent risk factor for CVD in women [6] Only six patients (6 %) were judged to be addicted to tobacco.

In 2 (2 %) of the patients, associated cardiovascular disorders such as CVA/PVD were observed. STEMI was the cause of the patient's presentation. The presentation of associated cardiovascular illnesses is more severe, and the results are worse.

Dyslipidaemia: In our study, the mean TC level was higher (194.6 mg/dl) than in MI cases in Tirupati, India (177.07 mg/dl [7] .The same could be said for the mean LDL level (158.2 mg/dl). However, the protective HDL level in our study (40.2 mg/dl) was found to be lower than in the previous study (46 mg/dl). Lipid abnormalities were found in 61.5 percent of participants in INTER-HEART study and 38.75 percent of participants in study conducted by a Bhasin et al [7]

Type of ACS

In our study, 72 (72 %) had STEMI, 18 (18 %) were NSTEMI and 10 (10 %) were diagnosed as UA. The maximum number of patients in our study (72 %) had STEMI, which contrasts with data from industrialised countries, where NSTEMI was the most common presentation.

In the STEMI subgroup, 36 people (50 percent of the STEMI population) had AWMI, 30 people (41.3 % of the STEMI population) had IWMI, 2 people (2.9 percent of the STEMI population 2.3 percent) had LWMI, and 4 people (58.8 % of the STEMI population) had PLWMI. In a comparable study," Veena Nanjappa et al [2] discovered that 45 percent of the participants had AWMI, 34 percent had IWMI, and 17 percent had LWMI/PLWMI.

Risk Assessment

Killip's Class:

In our study, 4.6 percent of STEMI patients were classified as Killip's class III, whereas 4.2 percent were classified as Killip's class IV. Killip's class I or II patients made up the majority of STEMI patients (76.4 percent and 14 percent of STEMI population respectively).

Killip's class was more than 3 in all of the patients who died. According to VeenaNanjappa et al [2] 12 percent of ST-elevation MI patients presented in Killips class III, whereas 15.7 percent presented in Killips class IV.

TIMI Score

The average TIMI score was 5 across all subtypes. In the UA, the mean TIMI risk score was 3 (SD +/-1) and in the NSTEMI subgroups, it was 4.3 (SD +/-1.4). STEMI patients had a mean TIMI score of 5.2 (SD +/- 2). The TIMI risk score was an excellent predictor of disease severity, with higher scores being associated with more problems. The TIMI risk score was > 9 in STEMI patients who died during their hospital stay.

Echocardiography

In 6 (6 %) patients, echocardiography revealed mild mitral regurgitation, and all of these had STEMI. An average percentage of people that were ejected was 47 percent. The STEMI patients had the lowest LVEF (45 +/- 6 %).

Coronary Angiography

Out of the total study population, 100 (100 %) individuals had coronary angiography. The major type of ACS disease was single vascular disease (44 percent). In 26 (26 percent) patients, triple vessel disease was discovered. TVD was found in 4 % of NSTEMI patients, 22.2 percent of STEMI patients, and none of the UA patients.

Eight (6.3 percent) patients had left main involvement, with four having STEMI and four having NSTEMI, 4 (4 percent) patients had normal or mild illness. Everyone was suffering from UA. In comparison to NSTEMI and STEMI, UA was more frequently linked with normal coronaries. Many patients in the UA group may have been misdiagnosed as having ACS.

Single vascular illness was the most common finding in a comparable investigation by" VeenaNanjappa et al." in 1910. TVD was seen in 13.9 percent of NSTEMI patients. 8 percent of STEMI patients, and 14.3 percent of UA patients. In each STEMI and NSTEMI groups, six patients had left major involvement.

Treatment

During their stay in the hospital or after discharge, all 100 study participants were given aspirin and statins. In 96 individuals, a second anti-platelet was used. Clopidogrel was utilised in 40 percent of the cases, prasugrel in 18 percent of the cases, and ticagrelor in 38 percent of the cases (38 percent). Because of its greater efficacy and better safety profile, ticagrelor is increasingly being used as a second anti-platelet drug. In our study, a total of 88 patients (88 %) got adjuvant anticoagulation. The most commonly used LMWH was 58 (58 percent). In 30 percent of the patients, unfractionated heparin was utilised, notably in those with AKI.

Emergency Revascularisation

Of the 72 patients who were fit for primary revascularisation, 40 patients (55.5 %) underwent either thrombolysis or primary PCI.

Thrombolysis

In 16 (22.2 %) of STEMI patients, thrombolysis was performed. Maximum number of patients had 12 hours to present. Streptokinase was given to all 16 individuals. There was no danger of IC bleed during or after streptokinase thrombolysis in any patients. Women having larger risk of bleeding problems than men, with the risk of major bleeding increasing 1.43-fold in the GUSTO-1 experiment [8] with thrombolytic treatment, female sex is an individual predictor of cerebral haemorrhage.

Primary PCI

In our analysis, 24 people (33.3 percent of the STEMI population) had PCI for primary revascularization. Primary PCI to the RCA was the most prevalent, with 12 cases. Ten patients had primary PCI [9] to the LAD, while two patients had primary PCI to the LCx. In a comparable study, VeenaNanjappa et al. found that 68.7 % of STEMI patients had primary angioplasty. In a study of STEMI patients by Mady Moriel et al [10] acute reperfusion was less in women than in males (53 percent vs. 63 percent, respectively, p = 0.01); thrombolysis was used in 30 % of patients, while PAMI was used in 70 % of STEMI patients.

Elective Revascularisation

Elective revascularization was performed on 72 of the 100 women. Maximum no of patients received PCI surgery (60 %) and 12 (12 %) had CABG surgery.

Single vessel PCI is most prevalent among all ACS subtypes in the PCI group. The majority of two-vessel or multivessel PCI was performed in NSTEMI and STEMI groups.

In a research by 'VeenaNanjappa et al [2] 69.4 percent of patients with NSTEMI got PCI, while 42.9 percent of patients with UA underwent PCI. Multivessel PCI was performed in 8.3 % of NSTEMI and 6 % of STEMI patients, but none in the UA group.

Around 96 percent of the people in our research had revascularization, either primary revascularization (thrombolysis or primary PCI) or elective revascularization (PCI or CABG surgery). Revascularization was performed on 83.6 percent of patients in a research by 'VeenaNanjappa et al [2]The fact that both investigations were conducted in a tertiary cardiac care facility may explain the greater cumulative percentage seen in both.

In-hospital Complications

CCF (14 %) is prevalent complication in the study cohort, followed by hypotension (4 %), and cardiogenic shock (2 %). They were mostly found in the STEMI group.

In 6 (6 %) patients, CHB was found, while ventricular tachycardia was found in 2 (2 %) patients. They were exclusively found in the STEMI group.

The extra-cardiac consequence is acute renal damage. Cardiogenic shock or CIN were the most common causes. Female gender is an independent predictor of MACE and bleeding problems in the Cadillac Trial [11]

Mortality

During their stay in the hospital, 4 (4 %) patients in the study died. Majority were elderly; Majority of them had STEMI, were late in presentation, and had higher Killip's class and TIMI risk scores. Two of the four patients died due to cardiogenic shock, while the other two died of ventricular tachycardia.

In a study conducted by 'VeenaNanjappa et al. (8.3 %) deaths were reported; 8 (6 %) occurred in the hospital, and 3 (2.3 %) occurred during the follow-up period. They were members of STEMI group.

In-hospital mortality was 3.9 percent in the Kerala ACS registry [12] compared to 8.2 percent in the STEMI group [13] In the AMI-FLORENCE registry [14] women had a 16 percent in-hospital death rate.

CONCLUSION

DM, HTN, dyslipidemia, obesity and physical inactivity, as well as family history of CAD are common risk factors in the research population. Tobacco usage is a lower risk factor for Indian women than it is for western women.

In female patients, grading systems such as Killip's class and TIMI score were fairly accurate in predicting outcomes.

The most prevalent CAG finding in the research population was SVD. Triple vascular disease affected about a quarter of the patients. In comparison to NSTEMI and STEMI, UA was more frequently linked with normal coronaries.

Only approximately a third of the eligible patients underwent primary revascularization, while nearly two-third of research received elective revascularization. This indicates female population is being treated unfairly.

Patient features such as advanced age, STEMI diagnosis, late presentation, higher Killip's class and TIMI risk scores were found to be linked with significant morbidity and mortality.

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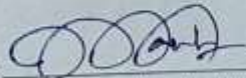Name of Journal: _JOURNAL OF CARDIOVASCULAR DISEASE RESEARCH_

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