COMMONEST SUBTYPE OF ACUTE CORONARY SYNDROME AMONG WOMEN ADMITTED IN CARDIAC CARE UNIT OF A TERTIARY CARE HOSPITAL IN RAWALPINDI, PAKISTAN

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ABSTRACT

Objective: To find out the common subtype of acute coronary syndrome among women of age 40-80+ admitted in cardiac care unit of a tertiary care hospital in Rawalpindi, Pakistan. **Design:** Cross-sectional observational study. **Study setting:** Fauji foundation hospital Rawalpindi, Pakistan. **Duration of study:** Total duration of 2 months. **Methodology:** This is a cross-sectional study conducted at a tertiary care hospital in Rawalpindi, Pakistan from January 2020 till March 2020 in cardiac care unit. Total of 49 female patients were selected randomly with diagnosed acute coronary syndrome. The ages of the female patients were between 40-80+ years. A typical ECG criteria and raised cardiac enzymes/markers were selected to find out the type of ACS. SPSS version 21 was used and data was analyzed p value of <0.05 was taken as significant. **Results:** In reference to subtype of ACS majority of patients 29 (59.2%) had STEMI. The most number of patients with ACS were of age group 60-70yr i.e. 14(28.6%) with P value 0.055 which is insignificant. Association of risk factors with ACS showed postmenopausal being the most common risk factor with 42(85.7%) patients and p value of 0.013 followed by hypertension and diabetes mellitus whereas least common risk factor turned out to be hyperthyroidism with only 2(4.1%) patients with p value of 0.487 which is insignificant. **Conclusion:** The final conclusion of the study showed that STEMI was the most common subtype of acute coronary syndrome among women of 60-80 years of age whereas NSTEMI was seen in relatively younger patients with age group ranging from 40-50 years of age.

KEYWORDS: Cardiovascular diseases, acute coronary syndrome, STEMI, NSTEMI, Unstable angina.

INTRODUCTION

According to World Health Organization cardiovascular disease is the leading cause of death in women over 45 years of age globally. While ischemic heart disease causes the most deaths in Pakistan.[1] Cardiovascular diseases can further be divided into different categories but our focus is going to be revolving around acute coronary syndrome.

Acute coronary syndrome is an umbrella term where the bloods supply to heart tissue is suddenly stopped. Myocardial infarction can be defined as an absence of supply of oxygen to myocardium (heart tissue) which leads to death or infarction of heart tissue and is a type of acute coronary syndrome.The pathogenesis of ACS include disruption of endothelium, inflammatory markers and changes in blood cells, not only vulnerable clots are risk factors for the development of acute coronary syndrome but blood prone to thrombosis and non-viable myocardium also plays important role in pathogenesis of acute coronary syndrome.[2] It is also noted that less critical coronary lesions with <50% of vessel occlusion may lead to progression and subsequently total occlusion will be accountable for around two-third of cases of acute coronary syndrome.[3] ACS refers to spectrum of different clinical presentations with rupture of atherosclerotic plaque that can lead to complete or partial occlusion of coronary arteries, the syndrome includes unstable angina, non-ST segment elevation myocardial infarction (NTSEMI[4], and ST segment elevated myocardial infarction, .Unstable angina and NSTEMI shares a same pathophysiology but differ in clinical

presentation, chest pain is more severe in case of MI. Unstable angina deals with obstruction to blood flow causing a decreased perfusion to myocardium. The mortality related to unstable angina is relatively lower than that of NSTEMI. Biomarkers are released few hours after NSTEMI. Gender differences play major role in pathophysiology of acute coronary syndrome and myocardial infarction. It has been seen through angiography that significant number of women have normal arteries but biochemical or imaging evidence of myocardial ischemia. These women may have defective coronary circulation that could lead to MI.[5] In comparison to men, non-ST- segment- elevation is more prevalent in women[6] than ST-segment-elevation. Men and women can present with different symptoms with acute coronary syndrome in one study 37% women and 27% men presented with no chest pain at all[7] Plaque erosion is more common in women than men and women of older age with reference to women of younger age.[8]
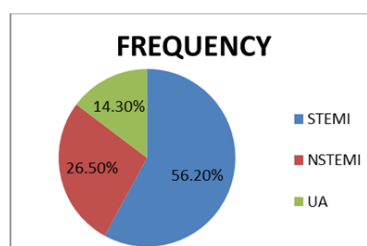
The risk factors for coronary artery disease include hypercholesterolemia, hypertension, diabetes mellitus, smoking, increasing age and obesity.[9] A number of researches and studies have observed the importance of blood pressure control in relation to cardiovascular diseases, good long term blood pressure control should be started before discharging the patient from hospital to improve the secondary prevention.[10],[11]

Most of these risk factors are modifiable for instance hypertension, obesity, smoking, diabetes mellitus and hypercholesterolemia which can be controlled and risk of developing acute coronary syndrome or other cardiovascular events will decrease while there are few non modifiable risk factors like age, family history, sex and obesity.[12] There are also flow limiting conditions such as spasm of arteries, stable plaque, prinzmetal angina, embolism is coronary arteries. Other conditions that can mimic NSTEMI which include contusion of myocardium, myocarditis, or presence of toxic substances.[13]

This is a cross-sectional study conducted at Fauji foundation hospital Rawalpindi from January 2020 till March 2020 in cardiac care unit. Total of 49 female patients were selected randomly with diagnosed acute coronary syndrome. The ages of the female patients were between 40-80 years and patients with age of less than 40 years were not included in the study. The data regarding the risk factors like hypertension, diabetes mellitus, hyperthyroidism, hyperlipidemia, menopausal status, iron deficiency anemia, smoking and naswar addiction were included. Patients of trauma, renal failure, family history of heart disease, and sedentary lifestyle were excluded. Patients with ST-segment elevation >1mm on two or more contiguous chest leads (V1-V6) or ST-segment elevation >1mm in two or more anatomically contiguous leads (II, III, aVf, I, aVl, V5, V6) at the J point on electrocardiogram were labeled as STEMI. The myocardial ischemic process is dynamic 12-lead electrocardiogram provides only a static changes ACC/AHA recommends serial 12-lead ECG tracings for patients admitted in hospitals to check for ST-segment changes.[14]

Patients with ST-segment depression of > 0.5mm or T wave inversion >1mm without Q waves in 2 contiguous leads with prominent R waves or R/S ratio>1 along with positive cardiac markers were labeled as NSTEMI. Those patients with ST-segment depression of > 0.5mm or T wave inversion >1mm without Q waves in 2 contiguous leads with prominent R waves or R/S ratio >1 plus negative cardiac markers were labeled as unstable angina. The data was analyzed using SPSS version 21. Percentage and frequency was calculated for age group, type of ACS, risk factors related to ACS. P value of <0.05 was taken as significant.

Table 1: Frequency of STEMI, NSTEMI and UA.

VARIABLES	Frequency	Percent
STEMI	29	59.2
NSTEMI	13	26.5
Unstable angina	7	14.3
Total	49	100.0

METHODOLOGY

Table 2: Stemi, Nstemi and Unstable Angina With Respect To Age Group.

VARIABLES	Age group					Total	P-Value
	40-50yr	50-60yr	60-70yr	70-80yr	80+yr		
STEMI	3	7	9	7	3	29	
NSTEMI	5	2	1	2	3	13	.055
UA	0	3	4	0	0	7	
Total	8	12	14	9	6	49	

PIE CHART SHOWING FREQEUNCY OF STEMI, NSTEMI AND UNSTABLE ANGINA

Table 3: Association of Stemi, Nstemi And Unstable Angina With Risk Factors.

VARIABLES		STEMI	NSTEMI	UNSTABLE ANGINA	Total	P-Value
Diabetes mellitus	Yes	20	7	4	31	0.602
	No	9	6	3	18	
Hypertension	Yes	20	11	4	35	0.388
	No	9	2	3	14	
Hyperthyroidism	Yes	2	0	0	2	0.487
	No	27	13	7	47	
Hyperlipidemia	Yes	4	0	0	4	0.223
	No	25	13	7	45	
Postmenopausal	Yes	27	8	7	42	0.013
	No	2	5	0	7	
Iron deficiency anemia	Yes	16	8	2	26	0.348
	no	13	5	5	23	
Smoking/naswar addiction	Yes	8	2	1	11	0.583
	No	21	11	6	38	

RESULTS
It is observed in this study conducted at Fauji foundation hospital Rawalpindi that the number of patients which had STEMI were 29 (59.2%), NSTEMI 13 (26.5%) and unstable angina 7 (14.3%) out of total 49 patients as seen in table 1. The age groups with respect to ACS were analyzed and it showed that out of 49 subjects 8 (16.3%) patients belonged to 40-50 yr age group, 12(24.5%) from 50-60yr age group, 14(28.6%) from 60-70yr age group, 9(18.4%) from 70-80yr age group and 6(12.2%) from 80yr and above age group as seen in table 2.In table 3 risk factor association with ACS manifests that 31(63.3%) had diabetes mellitus, 35(71.4%) hypertension, 2(4.1%) hyperthyroidism, 4(8.2%) hyperlipidemia, 42(85.7%) postmenopausal, 26(53.1%) iron deficiency anemia and 11(22.4%) were addicted to either naswar or smoking. In reference to subtype of ACS majority of patients 29 (59.2%) had STEMI. The most number of patients with ACS were of age group 60-70yr i.e. 14(28.6%) with P value 0.055 which is insignificant. Association of risk factors with ACS showed postmenopausal being the most common risk factor with 42(85.7%) patients and p value of 0.013 followed by hypertension and diabetes mellitus whereas least common risk factor turned out to be hyperthyroidism with only 2(4.1%) patients with p value of 0.487 which is insignificant as shown in the table 3. Thus, this study showed STEMI as most common type of ACS in women of >40yr age group.

DISCUSSION
This study was aimed to find out the different type of acute coronary syndrome among patients admitted in a tertiary care hospital Rawalpindi, Pakistan. Total of 49 patients were met the criteria of inclusion. All 49 patients who were included in this study were female due to hospitals entitlement policy which caters for the families of retired army personnel's. Due to this reason female predominance was recorded. The most common subtype of acute coronary syndrome among women was STEMI (ST-segment elevation myocardial infacrtion). Most of the patients were of age group 60-70yr with the p-value 0.055 which is insignificant. In reference to risk factors most common risk factor was hypertension in 71.4% patients with p-value 0.388 it was noted in one study that good long-term control of blood pressure ideally started before discharging the patient from hospital is required to reduce the subsequent events.[15] Patients who present with STEMI (ST segment elevation myocardial infarction) and NSTEMI (Non-ST segment elevation myocardial infarction) with pre-morbid such as diabetes mellitus have increase risk of worse outcome as compared to those who does not have diabetes mellitus.[16] There was only one significant variable association of acute coronary syndrome with postmenopausal women with p-value 0.013. The second common subtype of acute coronary syndrome was NSTEMI (Non-ST segment elevation myocardial infarction) with 13 (26.5%) patients[6] and it is observed that NSTEMI was more common in relatively younger patients in the range of 40-50yrs and it was noted that hypertension was the most common risk factor in relation to STEMI (Non-ST segment elevation myocardial infarction) as well as NSTEMI. Unstable angina emerged as least common type of acute coronary syndrome in women. Among the risk factors postmenopausal factor appeared as leading risk factor in women who had STEMI[17] early menopause is associated with higher cardiovascular disease risk including acute coronary syndrome(NSTEMI,STEMI and unstable angina) in postmenopausal women[18] late menopausal age emerged as better outcome for women after acute coronary syndrome as compared to those of early age menopause[19] the beneficial effect of estrogen is lost after menopause and is self-explanatory why women present later with cardiovascular events, replacing estrogen have not shown any beneficial effects and actually leads to increase in cardiovascular events such as acute coronary syndrome[20] followed by hypertension and diabetes.[21]

CONCLUSION
This study concluded that STEMI (ST-segment elevated myocardial infacrtion) was the most common subtype of

acute coronary syndrome among women of 60-70yrs of age and most common risk factor was hypertension whereas NSTEMI(Non-ST segment elevation MI) was seen in relatively younger patients with age group ranging from 40-50yrs of age with majority of patients having hypertension as major risk factor the study also showed that unstable angina is least common subtype of acute coronary syndrome in women.

RECOMMENDATIONS: More researches on this topic are encouraged regarding risk factors which are associated with each subtype of acute coronary syndrome; this study was done under limited resources. The sample size was small and it was more inclined towards female patients. Moreover further studies should be done to evaluate the risk stratification precisely.

Abbreviations: ACS.. Acute coronary syndrome, MI..Myocardial infarction, STEMI..ST-segment elevation myocardial infarction, NSTEMI.. Non-ST-segment myocardial infarction.

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