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STUDY ON GENDER DIFFERENCE IN ACUTE CORONARY SYNDROME IN YOUNG ADULTS IN TERTIARY HEALTH CENTER OF RURAL TELANGANA.

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ABSTRACT:

Acute coronary syndrome is no more a disease of elderly as before. Many young people are developing ACS. There is also difference among genders in terms of prevelance, risk factors and demographic features. To study the difference among both gender study was carried out. This is a retrospective study of young adults <46 yrs of age in our medical college from rural central India over a period from March 2020 to March 2021. This consists of comprehensive data of management, risk factors & clinical features of young acute coronary syndrome.

METHODS:

108 patients who presented with chest pain and other symptoms who underwent coronary angiogram diagnosed as ACS were included in this study. This is aretrospective, record based cross sectional study of patients with acute coronary syndrome of less than 45 years age group at RVM Institute of medical sciences and research center during March 2020 to March 2021.

RESULTS: Number of patients in both gender were proportionate in all age groups. The difference between genders was not statistically significant. Proportion of people consuming alcohol and smoking was high among males compared to females and this difference was statistically significant.

Similarly raised TROP I and CKMB was found more among men compared to women and the difference was statistically significant. Men showed lower ejection fraction and severe LV dysfunction. Male's shows more STEMI > Unstable angina > NSTEMI. As the disease was more severe among males they were managed predominantly by PTCA

GRAPHICAL ABSTRACT:

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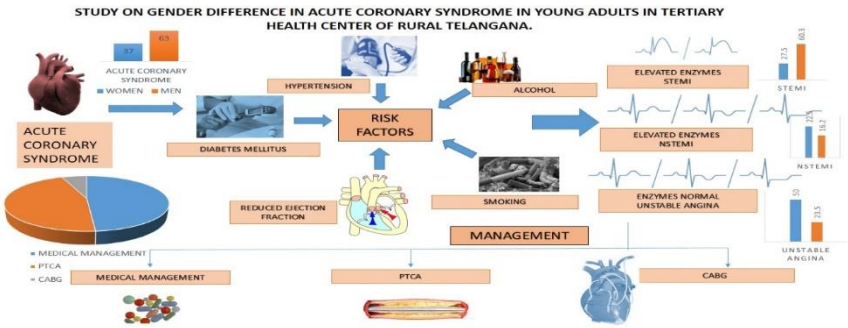

CONCLUSION: Females have milder disease compared to males. Presence of risk factors is low. ECHO and angiographic findings show milder form of disease in females compared to males and hence managed more commonly by medical management. Our study period is in COVID 19 period but patients were negative for COVID19, 23.4% of total ACS admissions were in young.

INTRODUCTION:

Acute coronary syndrome formerly termed Ischemic heart disease is a condition where there is inadequate supply of blood and oxygen to myocardium. It is a mismatch between demand and supply in myocardial tissues.[1]

Cardiovascular disease is considered as the primary burden of disease worldwide leading to death [2].

In India, coronary artery disease prevalence has witnessed a rapid spike from 1 to 6% in urban population and 4 to 6% in rural population. Cardiovascular diseases leading to the highest incidence of morbidity among young adults in the recent past. There is difference among both genders in terms of incidence, presence of risk factors, clinical presentation and outcome. We wanted to study difference among both genders.

Association of disease with major risk factors like diabetes mellitus, hypertension, hyperlipidemia and addictions including smoking are leading to the main cause of morbidity. Tobacco consumption, being one of the important causes in the mortality rate of India. This, also leads to being one of the main risk factors for the young myocardial infarction [3].

Diabetes mellitus is accounting for around 20% risk of developing ACS.[5] Hypertension being considered as aseparate risk of ACS.

The left main coronary artery(LMCA) supplies blood to the left side of the heart muscle.

And circumflex artery branches off the left coronary artery and encircles the heart muscle and supplies blood to the outer side and back of the heart. Right coronary artery (RCA). The right coronary artery supplies blood to the right ventricle, the right atrium, and the SA (sinoatrial) and AV (atrioventricular)nodes.[6]

Coronary angioplasty still remains gold standard for treatment aswell as risk stratification.

(1) Coronary angioplasty and thrombolysis is the mainstay treatment of choice in

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myocardial infarction. Nitrates, anti-platelets, beta blockers and anticoagulants are included in the medical management of MI. Aspirin, clopidogrel, beta blockers and statins are used in secondary prevention and ægold standard management. [4]
The difference in male and female population in terms of risk factors and the management used in both genders need to be studied to analyze how different male and female are in each character.

Objectives:
To determine difference in demographic characteristics of patients presenting as ACS in male and female

- Study the difference in risk factors of young ACS in male and female.
- Study the difference in the management strategy used in both gender.

STUDY TYPE: Retrospective record based cross sectional study including patients presented from March 2020 to March 2021.
DATA SOURCE: In hospital collection of data from the Medical record from department of general medicine and cardiology in RVM Institute of medical sciences and research centre, Laxmakkapally, Mulugu, Telangana. Data consisting of demographics, clinical presentation, medical history, addictions, investigations, treatment process during period of hospital stay was used.

INCLUSION CRITERIA:

- ☐ All consecutive young Acute coronary syndrome patients from March 2020 to March 2021 between the age less than 46yrs.
- ☐ COVID Rapid antigen test- Negative.

EXCLUSION CRITERIA:
Patients with myocarditis, cardiomyopathy and pulmonary embolism.

Methodology: All the patients diagnosed with ACS admitted to hospital during the study period below the age of 46 were enrolled in the study. The patients were divided according to the gender for analysis. Different variables like demographic details, risk factors, clinical presentation, lab investigation, diagnosis and treatment of the patients was recorded.

STATISTICAL METHOD:
Values are expressed as Mean±SD, frequency, percentages. Chi square test and Exact Fischer's test were used appropriately to find the association between demographic variables and study parameters. Odds ratio with confidence interval was calculated for risk factors. In all analysis, $P < 0.05$ was considered to be significant. All statistical analyses were performed using SPSS statistical software, version 20.

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RESULTS:

Table 1: Age and risk factor distribution of patients

AGE IN YEARS	**Male**	**Female**	**P value**
<30	8(11.8%)	3(7.5%)	.746
30-35	12(17.6%)	10(25.0%)	
35-40	18(26.5%)	11(27.5%)	
40-45	30(44.1%)	16(40.0%)	
Total	68(100.0%)	40(100.0%)	
Risk factors			
Diabetes	10(14.7%)	3(7.5%)	.364*
Hypertension	12(17.6%)	7(17.5%)	.985
Alcohol	29(42.6%)	3(7.5%)	.000
Smoking	11(16.2%)	1(2.5%)	.053*
Elevated enzymes			
TROP I	52(76.5%)	23(57.5%)	.039
CKMB	50(73.5%)	20(50.0%)	0.013

Number of patients in both gender were proportionate in all age groups. The difference between genders was not statistically significant.
Patients presenting with young myocardial infarction were more commonly found between 40-45 years of age group among both genders.

Proportion of people consuming alcohol and smoking was high among males compared to females and this difference was statistically significant.
Similarly raised TROP I and CKMB was found more among men compared to women and the difference was statistically significant.

Table 2: ECHO findings and disease pattern across both gender

ECHO	**MALE**	**FEMALE**	
Normal	30(44.1%)	30(75.0%)	.001*
Mild LV dysfunction	30(44.1%)	10(25.0%)	
Moderate LV dysfunction	6(8.8%)	0(0.0%)	
Severe LV dysfunction	2(2.9%)	0(0.0%)	
Ejection fraction			
<40	7(10.3%)	2(5.1%)	.000*
40-50	26(38.2%)	4(10.3%)	
50-60	25(36.8%)	14(33.3%)	
>60	10(14.7%)	20(51.3%)	

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Type of lesion			
AWMI	33(80.5%)	9(81.8%)	.829*
IWMI	6(14.6%)	1(9.1%)	
LWMI	2(4.9%)	1(9.1%)	
Diagnosis			
ST ELEVATION MI	41(60.3%)	11(27.5%)	.003
NSTEMI	11(16.2%)	9(22.5%)	
UNSTABLE ANGINA	16(23.5%)	20(50.0%)	

The ECHO findings among both genders was different and statistically significant.
Out of 108 patients only males presented more with moderate and severe LV dysfunction. Though mild LV dysfunction showing increased incidence in both male and female population.
Ejection fraction was lower in males compared to female which was statistically significant.
Males are found to have lower ejection fraction.
Both Males and Females showed increased incidence of AWMI. Presence of IWMI and LWMI was low and difference between both genders was not significant.
Males shows more STEMI > Unstable angina > NSTEMI while females showing increase in incidence of Unstable angina > STEMI > NSTEMI. STEMI constitutes 60.3% in males. Unstable angina in females constitutes 50%.
This shows that females had milder disease compared to males.

Table 3: Distribution according to management of patients.

CONCLUSION	**MALE**	**FEMALE**	**P value**
NORMAL	9(13.2%)	13(32.5%)	.003*
SINGLE VESSEL DISEASE	24(35.3%)	3(7.5%)	
DOUBLE VESSEL DISEASE	7(10.3%)	6(15.0%)	
TRIPLE VESSEL DISEASE	2(2.9%)	0(0.0%)	
LMCA	2(2.9%)	0(0.0%)	
MYOCARDIAL BRIDGING	10(14.7%)	9(22.5%)	
SLOW FLOW	8(11.8%)	9(22.5%)	
RECANALISED	4(5.9%)	0(0.0%)	
PATENT STENTS	2(2.9%)	0(0.0%)	
Management			
MEDICAL MANAGEMENT	33(48.5%)	35(87.5%)	.000*
PTCA	31(45.6%)	5(12.5%)	
CABG	4(5.8%)	0(0.0%)	

Males were predominantly diagnosed with single vessel disease accounting 35.3% in contrast in females where predominantly found to be having normal coronaries accounting 32.5%.

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Males presented mainly with obstructive type of lesion whereas females presented mainly with non obstructive type of disease.

As the disease was more severe among males they were managed predominantly by PTCA. Patients were mainly managed medically by thrombolysis, beta blockers. PTCA and stenting was done predominantly in male population constituting 45.6% in contrast to female population accounting for 12.5%. Patients were managed by CABG only in male population accounting 5.8%.

Table 4: below table shows obstructive pattern of disease

OBSTRUCTIVE	MALE	FEMALE	
LAD	25(36.8%)	2(5.0%)	
RCA	1(1.5%)	0(0.0%)	
LAD + RCA	3(4.4%)	3(7.5%)	
LAD + LCX	4(5.9%)	2(5.0%)	
RCA + LCX	2(2.9%)	0(0.0%)	
LAD + RCA + LCX	2(2.9%)	1(2.5%)	
OTHERS	31(45.6%)	32(80.0%)	.001

LAD being the most commonly affected vessel in both males and females. Females doesn't show increase in incidence of obstructive lesion when compared with males.

Males shows most of lesions affected mid > proximal segment while in females mainly shows lesion in mid part of coronaries.

DISCUSSION:

Out of 108 patients there were 68 males and 40 female population where there is higher male incidence of 63% in contrast to some studies where there is higher male preponderance of 98%. [7

According to Gender Differences on the Risk Evaluation of Acute Coronary Syndromes: The CARDIO2000 Study, acute coronary syndrome occurred more frequently in men than women (frequency ratio 4:1, men: women). [9]

According to Gender Differences on the Risk Evaluation of Acute Coronary Syndromes: The CARDIO2000 Study, The presence of hypertension however, had a significantly greater effect in women than men (OR=4.86 vs. 1.66; $p<0.01$). The impact of other factors (i.e., smoking, diabetes, body mass index, physical activity, alcohol consumption, and financial status), on the coronary risk difference between genders was similar for men and women.[9] But our study showed increased predominance of all the risk factors among males in contrast with the above study.

Proportion of people consuming alcohol and smoking was high among males compared to females and this difference was statistically significant.

Similarly raised TROP I and CKMB was more among men compared to women and the

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difference was statistically significant.

According to Prevalence of coronary heart disease and risk factors in an urban Indian population: Jaipur Heart Watch-2, Risk factor prevalence showed that smoking/tobacco use was present in 36.5% males and 11.7% females. Hypertension was present in 36.4% males and 37.5% females. Diabetes was found in 13.1% of males and 11.3% females [10]

Our study showed similar results to above study with males having higher predominance of hypertension and diabetes.

According to Coronary heart disease and risk factors in India – On the brink of an epidemic? Study

The effect of these risk factors was uniform in men and women, across regions and ethnic groups, making the study universally applicable. [11]

According to The Prevalence, Clinical Spectrum and the Long Term Outcome of ST-segment Elevation Myocardial Infarction in Young – A Prospective Observational Study Smoking (37.6%) was observed to be the most common risk factor for young STEMI, followed by diabetes mellitus (16.8%) and hypertension (16%).[8]

According to Sex and gender differences in presentation, treatment and outcomes in acute coronary syndrome, a 10 year study from a multi-ethnic Asian population: The Malaysian National Cardiovascular Disease Database—Acute Coronary Syndrome (NCVD-ACS) registry study Women were older and more likely to have diabetes mellitus, hypertension, dyslipidemia, previous heart failure than men contrast to our study.[12]

According to Sex and gender in cardiovascular medicine: presentation and outcomes of acute coronary syndrome study states that Women continue to receive less aggressive invasive treatment and pharmacotherapies,[13] similar to our study.

According to Jacobs AK. Coronary intervention in 2009. Are women no different than men? At younger ages women more often have ACS with angiographically ‘normal’ coronary arteries than men, similar to our where women were found to have predominantly normal coronaries. [14, 15]

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