

## Original Research

### A Study of Profile of Acute Coronary Syndrome in Young Patients in Tertiary Care Hospital in Punjab- A Clinical Study

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#### ABSTRACT:

Acute coronary syndrome (ACS) is believed to more clearly reflect the disease progression associated with myocardial ischemia and includes Unstable angina (UA), Non ST elevation myocardial infarction (NSTEMI) and ST elevation myocardial infarction (STEMI). The present study was conducted on 100 patients of both genders less than 45 years of age presenting with the diagnosis of Acute Coronary Syndrome. Patients presenting with serial ECG – ST segment elevation in more than 2 contiguous leads, ST segment depression > 1 mm in 2 contiguous leads and/or T-wave inversion during chest pain, episodes or any bundle branch block (new onset LBBB or RBBB) or AV block were enrolled in study. A correlation of history, clinical features, risk factors, ECG, Echocardiography, cardiac biomarkers during hospital stay with the severity of ACS were evaluated. ST elevation MI formed the major subgroups (46%) followed by Unstable Angina (33%) and Non ST elevation MI (21%). There was positive correlation of smoking (r- 0.421, p- 0.01), sedentary lifestyle (r- 0.405, p- 0.01), hypertension (r- 0.315, p- 0.05) and dyslipidemia (r- 0.287, p- 0.001) in patients with ACS. Diabetes mellitus (r- 0.543, p- 0.12) and family history of ischaemic heart disease (r- 0.642, p- 0.81) had no positive correlation. Acute coronary syndromes are a major cause of concern in the present-day world particularly when it happens in a younger age group population. It poses a huge economic burden to the society also with loss of life and morbidity at a productive age group.

**Key words:** Acute coronary syndrome, Non ST elevation MI, Unstable Angina.

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#### INTRODUCTION

Acute Coronary Syndrome (ACS) which includes unstable angina (UA), non ST-segment elevation myocardial infarction (NSTEMI) and ST-segment myocardial infarction (STEMI) is an umbrella term for life-threatening situations that occur when the blood supply to the heart is blocked due to destabilization of a previously stable atherosclerotic plaque. The term ACS was adopted because it was believed to more clearly reflect the disease progression associated with myocardial ischemia.<sup>1</sup>

According to the World Health Organization (WHO) in 2008 approximately 17.3 million people died because of CVD, of which 7.3 millions deaths were due to coronary artery disease. The epidemiology in India is characterized by premature occurrence in the young and low/middle income group, high mortality and high prevalence of

diabetes.<sup>3</sup> The high incidence of IHD in India in younger age group is difficult to explain on the basis of prevalent conventional risk factors - like conventional lipid profile and risk factors like sedentary lifestyles, obesity, metabolic syndrome and diabetes. Increase in smoking lead to high occurrence in younger age group.<sup>4</sup>

ACS begins when a disrupted atherosclerotic plaque in a coronary artery stimulates platelet aggregation and thrombus formation. It is the thrombus occluding the vessel that prevents myocardial perfusion.<sup>5</sup> The present study was conducted to study the profile of acute coronary syndrome in young patients in tertiary care hospital in Punjab, India.

#### MATERIALS & METHODS

The present study was conducted in Casualty and various medicine wards of Guru Nanak Dev Hospital and

Government Medical College Amritsar. It comprised of 100 patients of both genders less than 45 years of age presenting with the diagnosis of Acute Coronary Syndrome.

The patients were diagnosed by history of chest pain and its duration. Patients presenting with serial ECG – ST segment elevation in more than 2 contiguous leads, ST segment depression > 1 mm in 2 contiguous leads and/or T-wave inversion during chest pain episodes or any bundle branch block (new onset LBBB or RBBB) or AV block were selected.

All patients underwent echocardiography for evidence of regional wall motion abnormality. The course and prognosis of ACS- UA/NSTEMI/STEMI was analyzed in patients. A correlation of history, clinical features, risk factors, ECG, Echocardiography, cardiac biomarkers were evaluated with severity of ACS. Complications such as recurrent angina, recurrent MI, Arrhythmias, LVF and death were recorded. All statistical analyses were performed using IBM-SPSS 20.0 statistical software (IBM-SPSS Inc, Chicago, IL). A value of  $p < 0.05$  was considered statistical significant.

**RESULTS**

**Table 1 Distribution of Patients with Acute Coronary Syndrome**

Clinical Subtype	Total number of patients	Percentage
ST- elevation MI	46	46%
Non ST-elevation MI	21	21%
Unstable Angina	33	33%

Out of 100 patients 46 (46%) were of ST elevation MI forming the major subgroup followed by Unstable Angina 33 (33%) and 21 (21%) of Non ST elevation MI .(Table1)

**Table 2 Comparison of baseline clinical characteristics of ACS patients along with coronary risk factors and modalities of treatment**

Parameters	STEMI	NSTEMI	UA
<b>Gender</b>			
Male	36	11	20
Female	11	9	13
<b>Risk factors</b>			
Smoking	43	13	15
Dyslipidemia	35	7	5
Sedentary lifestyle	27	13	19
Hypertension	24	4	12
Positive family history of premature IHD	12	4	2
Diabetes	10	2	4
Obesity	5	3	10
Troponine T	363.46	251.33	15.21
CPK- MB	189.85	138.52	21.24
<b>Clinical symptoms</b>			
Chest pain duration	28	17	27
SOB	7	2	3
Diaphoresis	8	2	3
Syncope	3	0	0
<b>Thyroid Profile</b>			
T3	1.0	1.2	1.1
T4	9.1	9.0	9.2
TSH	4.8	4.5	4.7
<b>Outcome</b>			
Referred for PCI	28	4	0
Fibrinolysis done	17	0	0
Medical management	0	15	33
Death	1	2	0

Out of 46 patients of STEMI 36 (53.7%) were male ,11 (48.4%) were female, smoking was present in 43( 93.4%), dyslipidemia in 35 (76.8%), sedentary life style in 27(56.6%), hypertension in 24(51.1%), positive family history of premature IHD in 12(26%),diabetes mellitus in 10(21.7%),obesity in 5(10.8%) of patients.28 Patients presented with chest pain ,8 were having diaphoresis ,7 presented with SOB and 3 were having syncope on presentation.The mean troponin T level was 363.46 and CPK –MB was 189.85.Patteren of MI on echocardiography was AWTMI in 29 ,ALWTMI in 22 patients ,IWTMI in 5 and LWWTMI in 9 patients.In present study 28 patients of STEMI were referred for PCI fibrinolysis was done in 17 and there was death of 1 patient.In present study in NSTEMI out of 21patients 11 (16.4%) were male ,10 (27.2%) were female, smoking was present in 13(61.9%) ,dyslipidemia in 10 (47.6%), sedentary life style in 20(95.2%), hypertension in 10(47.6%), positive family history of premature IHD in 12(5%),diabetes mellitus in 2 (9.5%),obesity in 5(19.5%) of patients.17 patients presented with chest pain ,2 were

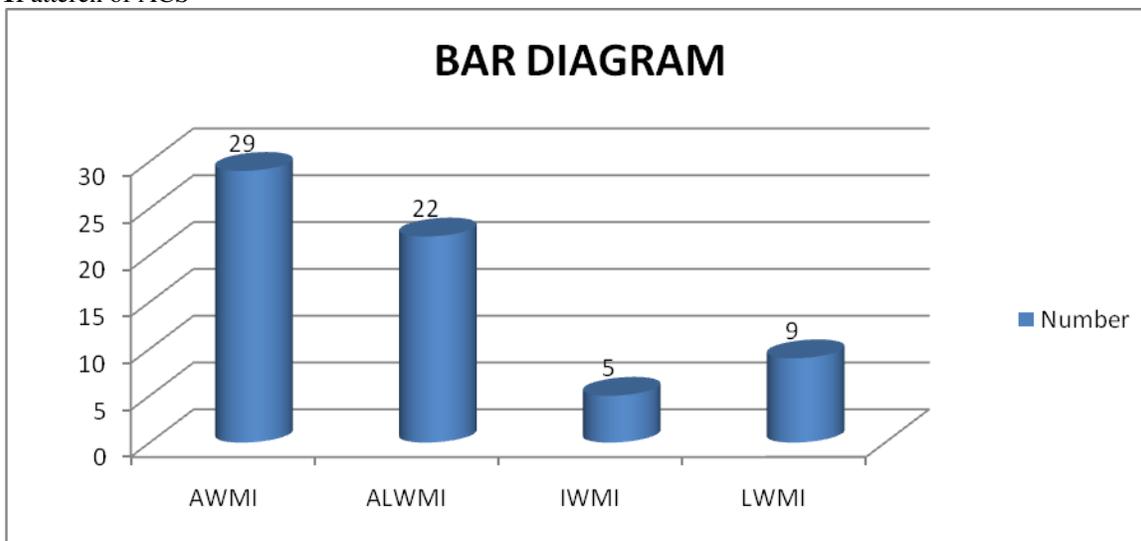
having diaphoresis ,2 presented with SOB and 3.The mean troponin T level was 251.33 and CPK –MB was 138.52.Patteren of MI on echocardiography was AWTMI in 15 ,ALWTMI in 5 patients ,IWTMI in 2 and LWWTMI in 2 patients. In present study 4 patients of STEMI were referred for PCI ,medical management was done in 15 and there was death of 2 patients.In present study in UA group out of 33 patients 20 (29.8%) were male ,13 (39.3%) were female, smoking was present in 12( 61.9%) ,dyslipidemia in 20 (47.6%), sedentary life style in 23(95.2%), hypertension in 8(47.6%), positive family history of premature IHD in 5(23.8%),diabetes mellitus in 4(9.5%),obesity in 5(23.8%) of patients.27 Patients presented with chest pain ,3 were having diaphoresis ,3 presented with SOB. The mean troponin T level was 15.21 and CPK –MB was 21.24.On ECG there was ST depression in 16 patients and T wave inversion in 22 patients..In present study all 33 patients were medically managed (Table2).

**Table 3 Correlation of risk factor in ACS patients**

Risk Factors	Pearson correlation	Sig (2- tailed)
Smoking	0.421	0.01
Sedentary lifestyle	0.405	0.01
Hypertension	0.315	0.05
Dyslipidemia	0.287	0.001
Diabetes mellitus	0.543	0.12
Family history	0.642	0.81

There was positive correlation of smoking (r- 0.421, p- 0.01), sedentary lifestyle (r- 0.405, p- 0.01), hypertension (r- 0.315, p- 0.05) and dyslipidemia (r- 0.287, p- 0.001) in patients with ACS. While diabetes mellitus (r- 0.543, p- 0.12) and family history (r- 0.642, p- 0.81) has no positive correlation.

**Graph 1**Patteren of ACS



In patients with Acute myocardial infarction diagnosis was Anterior wall MI in 29 (44.6%), Anterolateral MI in 22 (33.8%), Inferior wall MI in 5 (7.6%) and Lateral wall MI in 9 (13.8%).

## DISCUSSION

Coronary Artery Disease (CAD) is a major cause for morbidity and mortality in the developing countries. Indian populations have been observed to have a more severe CAD that has its onset at younger age with male predominance.<sup>6</sup> Although a number of risk factors have been identified over the past several decades, the precise etiology and mechanisms leading to the development of CAD are not fully understood. These include abnormal levels of circulating cholesterols with elevated level of LDL-cholesterol and reduced level of HDL-cholesterol, hypertension, cigarette smoking, diabetes mellitus, male gender, post-menopausal state, advanced age, sedentary life style, obesity and a positive family history of premature cardiovascular disease.<sup>7</sup>

It is a small scale prospective study carried out in Guru Nanak Dev Hospital and Government Medical College Amritsar to assess the patients presenting with Acute Coronary Syndrome for the presence of risk factors, to correlate these risk factors with the patients history, clinical picture during hospital stay, to correlate ECG (Electrocardiography), Echocardiographic findings and biochemical parameters (Cardiac Enzymes, Troponin-T) during hospital stay and to stratify the patients on the basis of patients history, clinical feature, risk factors, ECG, Echocardiographic findings and biochemical parameters and to correlate profile of Acute Coronary Syndrome in young patients with thyroid function tests.

In present study, we stratified the patients according to their clinical feature, ECG, biochemical parameters, into 3 subgroups, i.e., ST elevation MI, Non ST elevation MI, Unstable Angina and it shows that ST elevation MI formed the major subgroups (46%) followed by Unstable Angina (33%) and Non ST elevation MI (21%). We found that maximum number of males (36) was of STEMI and females were of unstable angina (13). Antoniades L et al<sup>8</sup> found that 45% of patients were diagnosed with STEMI, 41.3% with NSTEMI and 13.7% with unstable angina.

In present study we observed that common risk factors in STEMI were smoking, dyslipidemia, sedentary lifestyle, hypertension, positive family history of premature IHD, diabetes and obesity.

Bhali et al<sup>9</sup> in a prospective study found that male sex (77%) and sedentary lifestyle (73%) were identified as most common risk factors. Other risk factors in order of frequency were dyslipidemia (50%), diet (40%), diabetes mellitus (37%), oral tobacco addiction (37%), hypertension (33%), smoking (30%), alcohol (17%), family history (13%), obesity (13%) and OC pill intake (0%).

We found a positive correlation of smoking (r- 0.421, p- 0.01), sedentary lifestyle (r- 0.405, p- 0.01), hypertension (r- 0.315, p- 0.05) and dyslipidemia (r- 0.287, p- 0.001) in patients with ACS. Diabetes mellitus (r- 0.543, p- 0.12) and family history (r- 0.642, p- 0.81) has no positive correlation. We observed a positive correlation of CPK-MB (r- 0.415, p- 0.01) and troponin T (r- 0.216, p- 0.03)

with ACS. This is in agreement with study by Pitsavos C et al.<sup>10</sup>

Pimental RC et al (2006)<sup>11</sup> found that of the 70 patients admitted, 13 (18.6%) had “euthyroid sick syndrome” (ESS), a condition characterized by decreased serum T3 and/or free T3, increased serum reverse T3 (rT3), plus normal serum TSH, T4, and free T4. Patients belonging to the STEMI group showed early elevations, in addition to higher mean reverse T3 (rT3) and lower mean T3 and free T3 levels. In coronary heart disease patients that progressed to death, hormonal findings were consistent with those found in the ESS, with more expressive rT3 and T3 mean values. Authors suggested the importance of recognizing the “euthyroid sick syndrome” in coronary heart disease patients, suggesting an association with poorer prognosis in patients with acute coronary syndrome. We found that the diagnosis was AWTMI in 29 (44.6%), ALWTMI in 22 (33.8%), IWTMI in 5 (7.6%) and LWWTMI in 9 (13.8%). Lamprou et al (2017)<sup>12</sup> found AWTMI in 45%, ALWTMI in 36%, IWTMI 10% and LWWTMI in 9 %.

## CONCLUSION

We can conclude that Acute coronary syndromes are a major cause of concern in the present-day world particularly when it happens in a younger age group population. It poses a huge economic burden to the society also with loss of life at a productive age group. Though the technologies have emerged to combat the situation by various newer revascularization techniques which are becoming available more and more in various parts of the world the main crux should be on preventive strategies which are possible only by dissemination of health education on all possible means by lifestyle modification.

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