



A RETROSPECTIVE STUDY OF ACUTE CORONARY SYNDROME IN YOUNG ADULTS

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ABSTRACT Acute Coronary Syndrome (ACS) encompasses unstable angina, NSTEMI, and STEMI resulting from blood flow obstruction to acute coronary artery, causing heart muscle necrosis. In spite of the fact that the incidence of ACS has fallen in the elderly, it's also amplifying among young adults over the last few years. In India, 25% of acute myocardial infarction occurs among patients aged below 45 years due to lifestyle determinants. These are tobacco and chronic alcohol consumption, narcotics such as cocaine and amphetamines, high-fat diet, and stress due to occupation, assisting to rising ACS rates among young adults. It looks to determine risk factors and end result of ACS in young adults and examine the socio-economic consequences of early cardiovascular disease. Information of patients is assessed to determine alliance with lifestyle and development of ACS. Findings suggest the importance of early intervention, lifestyle modification, and public health interventions in the management of ACS in youth. This study emphasizes early detection and prevention since young ACS patients have long-term complications and high costs. It suggests targeted awareness, regular health screening, and lifestyle counseling to manage risk factors. These measures can reduce ACS-related morbidity and mortality in young individuals. The study contributes to growing evidence for age-specific prevention of cardiovascular disease in youth.

KEYWORDS : STEMI, N-STEMI, Unstable Angina, Non-Traditional Risk Factors, Hypertension, Smoking

INTRODUCTION

Acute coronary syndrome covers a variety of conditions like unstable angina, NSTEMI, and STEMI. It happens when there's a sudden drop or partial blockage in blood flow to the heart, which can cause injury to the heart tissue. Over the past ten years, the rate of ACS in older adults has declined around the world, but it's also been on the rise among younger people lately. Unfortunately, when younger individuals experience ACS, they risk losing many years of their lives in recovery, and recovering from these events can be expensive in terms of healthcare and other resources. In India, about 25% of heart attacks happen in people under 45. The modern lifestyle of many young folks—often involving smoking, drinking, using drugs like cocaine and amphetamines, eating a lot of fatty and fast foods, and dealing with high job stress—is playing a big role in this growing problem.

STEMI, or ST-Elevation Myocardial Infarction, is notable by an elevation in the ST segment on an ECG in a specific lead, which usually happens when one or more coronary arteries are completely blocked. Commonly, this is due to a thrombotic blockage that forms from atherosclerotic plaque in these arteries. This can lead to unforeseen plaque rupture which is followed by changes in the vascular endothelium which later trigger a series of platelet adhesion, activation, and aggregation, eventually resulting in thrombosis. Such changes affect the heart's electrical impulses, which can be detected through ECG and cardiac biomarkers. The location of the ST-segment changes often correlate to the area of the heart experiencing acute ischemia. STEMI accounts for about 30% of all Acute Coronary Syndromes (ACS). To confirm the presence of ischemic myocardial injury during a myocardial infarction, it's crucial to corroborate unusual cardiac biomarker levels. Common clinical symptoms of STEMI include chest discomfort, abnormalities on the ECG, and myocardial ischemia, along with shortness of breath which has 4 grades depending on the severity, sweating (diaphoresis), nausea, and vomiting. Moreover, some atypical symptoms are frequently seen in women or patients with diabetes, such as indigestion, confusion, general malaise, or pain in uncommon areas like the jaw or throat.

NSTEMI occurs when there's decreased blood flowing to the heart muscle as a coronary artery is partially blocked. In cases of ischemia without ST segment elevation, NSTEMI shows up with positive cardiac biomarkers, particularly troponin. Typically, ST segment depression and T wave inversion on the ECG is seen. This condition often emerges from an imbalance between the heart's oxygen supply and demand, which can be due to various health disorders. The ratio of

men to women with NSTEMI is about 3:2. Most patients who face NSTEMI head to the emergency department, showing symptoms like chest pain, pressure or tightness, nausea or vomiting, and feelings of light-headedness or palpitations. Over recent years, there's been a slight increase in NSTEMI cases. In general, those affected tend to be younger males. Treatment usually involves cardiac catheterization or PCI (percutaneous coronary intervention), along with medications. Since troponin levels are elevated in these patients, they often receive antithrombotic therapy. The main goals of treatment is to lower the heart's oxygen demand, increase its oxygen supply, and prevent the further formation of clots. Medications like antithrombotic, antianginal drugs, and statins are mostly used.

Unstable angina is another form of coronary heart disease that tends to occur more frequently in younger persons. It's caused by decreased blood flow to the heart muscle, which can lead to heart attacks and atherosclerosis. This type of angina is often unpredictable and can happen even at rest, making it an emergency situation. While nonsteroidal anti-inflammatory drugs (NSAIDs) are said to potentially increase the risk of developing angina, this has not been extensively studied. Various traditional risk factors contribute to unstable angina, including gender, age, smoking (including passive smoking), genetic predisposition, high blood pressure, diabetes, dyslipidemia, and obesity. Notably, obesity in young adulthood is a significant risk factor, affecting over 30% of the population in India, which may raise the likelihood of cardiovascular mortality. Recent studies have shown that the most commonly affected age group for unstable angina ranges from 40 to 45 years, followed by those between 30 and 39 years. The typical symptoms include chest pain, sweating, and breathlessness, with epigastric discomfort being less common. In the younger demographic, there were cases of left ventricular failure and cardiogenic shock, but most patients were discharged after receiving treatment. Therefore, it's crucial to implement preventive measures and raise awareness about common risk factors to help educate the population and prevent cardiac issues among young adults (under 45 years).

MATERIALS AND METHODS

Data collection will focus on a range of variables, including demographics, clinical presentation, traditional and non-traditional risk factors, diagnostic test results, treatments received, and both in-hospital and long-term outcomes. Demographic data such as age, sex, and race will be recorded, along with presenting symptoms and time to hospital presentation. Risk factors will include both traditional

elements like hypertension and diabetes, as well as non traditional factors like smoking, drug use, and obesity. Diagnostic data will cover ECGs, echocardiograms, and coronary angiograms.

Study Methods/Study Procedure/Methods of Assessment:

Study Design: This study is a retrospective observational study.

Study Site: Apollo spectra hospital –Ameerpet, Hyderabad

Duration of the Study:

Study Duration: Six months

Total Data Collection Period: Three months (October 2024 to march 2025)

Sample Size: The sample size will be between 30-70

Study Criteria:

Inclusion Criteria:

- Patients of age from 18 –45 years.
- Electrocardiogram (ECG) evidence of ACS.
- The patients should be presenting an illness of ACS, such as chest pain, dyspnea, or related cardiovascular problems.
- Complete medical records should contain demographics, clinical history, diagnostic tests data for analysis.

Exclusion Criteria:

- Patients of age above 45 years.
- Pregnant women.
- Patients of age below 18 years.

Data Collection

Data would be extracted from the participating health centres. Demographic data to be collected would include age, gender, race/ethnicity, BMI, and socioeconomic status according to occupation, education, and insurance status. Finally, "clinical presentation" will include data on the nature and duration of symptoms such as chest pain, dyspnoea, fatigue, or abdominal discomfort, as well as time from the onset of symptoms to admission to hospital. A detailed medical history would also include not just the usual risk to the cardiovascular system, like hypertension, hyperlipidaemia, and diabetes, but other non-conventional risks in life, such as smoking, alcohol, drugs, and obesity, and family history. More diagnostic information is furnished by the outcome of ECG, cardiac biomarkers, such as troponins, echocardiograms, and coronary angiograms that characterize heart function and assess the severity of ACS.

RESULTS

In our current observational study, a total of 70 patients were assessed for a period of 6-months in APOLLO SPECTRA HOSPITALS, AMEERPET. We included the patients who were diagnosed with ACS and risk factors.

Table 1 Based on Gender:

GENDER	NO.OF PATIENTS	PERCENTAGE
MALE	50	70%
FEMALE	20	30%

The results indicate that ACS is more common in males compared to females in the younger adult population. Out of 70 patients, 20 were female (30%) and 50 were male (70%).

Table 2 Based on Age:

AGE	NO.OF PATIENTS	PERCENTAGES%
18-24	4	5.71%
25-32	2	2.85%
33-38	8	11.42%
39-45	59	84.28%

Among 70 patients around 84% (59) patients between the age group of 39-49 years were associated with ACS where as 11%,2%, and 5% patient between the age groups of 33-38, 25-32, and 18-24 years were associated with ACS respectively.

Table 3 Based on Symptoms

SYMPTOMS	L.NO. OF PATIENTS	PERCENTAGE
CHEST PAIN	53	41%
SOB	30	23%
PALPITATIONS	8	6%
ABDOMINAL DISCOMFORT	1	1%
SWEATING	16	12%
PEDAL ODEMA	1	1%

NAUSEA	1	1%
GIDDINESS	8	6%
VOMITING	4	3%
BURNING	2	2%
COUGH	3	2%
FEVER	2	2%

Among patients with ACS, the most common symptom was chest pain, reported by 41% of them, and shortness of breath at 23%. Sweating was also noted quite a bit, with 12% of patients experiencing it. Some patients had palpitations and giddiness, each mentioned by 6% of patients. Then there were a few less symptoms like vomiting (3%), cough (2%), burning sensation (2%), and fever (2%)., symptoms like abdominal discomfort, pedal edema, and nausea were rarely, each at 1%. Most of the patients experienced chest pain and shortness of breath followed by sweating, palpitation etc.

Table 4 Based on Risk Factors

SYMPTOMS	NO.OF PATIENTS	PERCENTAGE
HYPERTENSION	30	42.80%
DM	26	37.10%
TMT	2	2.85%
HYPOTHYROID	3	4.28%
CVA	1	1.42%
GERN	2	2.85%
ALCHOL WITHDRAWAL SYNDROME	1	1.42%
CARDIOGENIC SHOCK	1	1.42%
NEPHROPATHY	1	1.42%
NEUROPATHY	1	1.42%
DUODENAL ULCER	1	1.42%

Hypertension showed up as the most common comorbidity in ACS patients, affecting about 42.8% of them, diabetes mellitus followed closely at 37.1%. We also noted other conditions like hypothyroidism at 4.3%, TMT positive cases at 2.9%, and GERD at 2.9%. Some less common comorbidities—like CVA, alcohol withdrawal syndrome, cardiogenic shock, nephropathy, neuropathy, and duodenal ulcer—each made up around 1.4% of the cases. hypertension and diabetes emerged as the main traditional risk factors, impacting nearly four out of five patients we studied. Most ACS patients here also had high blood pressure or diabetes. There were a few with thyroid problems, reflux, or some rarer issues, but hypertension and diabetes cases were high.

Table 5 Based on Addiction:

ADDICTION	NO. OF PATIENTS	PERCENTAGE
SMOKING	25	35.71%
ALCOHOL	7	10%
TOBACCO	4	5.71%
DRUG USE	4	5.71%
NO HABITS	27	38.57%

In our study, we found that smoking was the most common addiction, with 35.7% of ACS patients reporting it. Alcohol consumption was seen in 10% of patients, while both tobacco and drug use were each noted at 5.7%. 38.6% of the patients indicated they had no addictive habits at all, showing that ACS can affect individuals even without lifestyle-related risk factors.

Table 6 Based on ACS Types:

ACS Type	No of patients	Percentage
NSTEMI	15	21%
STEMI	26	37%
Unstable angina	29	41%

Our study showed that unstable angina was the most common presentation at 41%. we had ST-elevated myocardial infarction (STEMI) at 37%, and non-ST-elevated myocardial infarction (NSTEMI) at 21%. Overall, these findings suggest that there is a variety of ACS presentations, with unstable angina being somewhat more common .

Table 7 Based on Disease Involved:

NO.OF DISEASE	NO.OF PATIENTS	PERCENTAGE%
SVD	28	40%
DVD	25	35.71%
TVD	17	24.28%

Among the 70 patients, Single Vessel Disease (SVD) was the most prevalent, affecting 28 individuals (40%). Double Vessel Disease (DVD) occurred in 25 patients (35.7%), Triple Vessel Disease (TVD) was found in 17 patients (24.3%). This study shows that SVD was the leading pattern.

Table 8 Based on Pain Scale:

SCALE	NUMBER OF PEOPLE
0	28
1-2	29
3-4	8
5-6	3
7-8	2
9-10	0

We found that 28 patients (40%) reported no pain at all (scale 0).29 patients (41.4%) experienced only mild pain (scale 1–2).8 patients (11.4%) indicated moderate pain (scale 3–4).3 patients (4.3%) had moderately severe pain (scale 5–6).Just 2 patients (2.9%) reported severe pain (scale 7–8).None of the patients indicated experiencing extreme pain (scale 9–10).Overall, the majority reported no or just mild pain (81.4%), while only 5 patients (7.2%) experienced pain classified as moderately severe to severe.

Table 9 Based on GRBS:

50-100	7
101-150	30
151-200	23
201-250	4
251-300	4
301-350	2

In our study we found that 30 patients out of 70 (about 42.8%), had GRBS levels ranging from 101 to 150 mg/dl. Twenty-three patients (32.8%) displayed elevated levels between 151 and 200 mg/dl, suggesting that a significant number had issues with glucose regulation. Only 7 patients (10%) showed lower values, falling in the range of 50 to 100 mg/dl.A smaller percentage (14.2% combined) experienced marked hyperglycaemia with readings over 200 mg/dl. By this we can say that glucose abnormalities were quite common among ACS patients, with many showing signs of mild to moderate hyperglycaemia.

CONCLUSION

Heart problems are often thought of as an “older person's disease,” but that's no longer true. More and more young adults are being diagnosed with Acute Coronary Syndrome (ACS) — a condition where blood flow to the heart suddenly gets blocked. What makes this especially worrying is that many of these cases are tied to lifestyle habits like smoking, drinking too much, drug use, and unhealthy eating, rather than the traditional risk factors we usually expect.

When ACS strikes, it can be life-threatening. It often shows up as a heart attack or severe chest pain that needs immediate treatment. The good news is that medical advances have improved recovery, but the best defense is still prevention. That means paying attention to our daily choices — moving our bodies, eating nutritious foods, managing stress, and cutting down on harmful habits.

To really turn the tide, we need more awareness, regular checkups for young people, and supportive programs that make healthy living easier. Doctors can help by keeping a close eye on those at higher risk and guiding them toward safer choices.

At the end of the day, protecting your heart isn't just about living longer — it's about living better, with the energy and freedom to enjoy life fully.

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