ISSN: 2279 - 0594

Journal of Biomedical and Pharmaceutical Research

Available Online at www.jbpr.in

CODEN: - JBPRAU (Source: - American Chemical Society)

Index Copernicus Value: 72.80

(National Library of Medicine): ID: (101671502)

Volume 7, Issue 2: March-April: 2018, 91-97

Research Article

STUDY OF THE RISK FACTORS FOR ACUTE CORONARY SYNDROME IN YOUNG ADULTS

Dr. Raj Kumar Agarwal[1], Dr. Praveen Kumar Bugalia[2]

[1]Assistant Professor Dept. of General Medicine Venkateshwara Institute of Medical Sciences Gajraula U.P. India

[2]Assistant Professor Dept. of General Medicine Venkateshwara Institute of Medical Sciences Gajraula U.P. India

Received 17 January 2018; Accepted 03 March. 2018

ABSTRACT

Background: People of Indian descent are increasingly more likely to have cardiovascular risk factors for acute coronary syndrome (ACS), which is currently one of the most prevalent causes of mortality. According to the evidence that is now available, young patients account for 0.4–19% of all ACS cases, depending on the age cutoff.

Aims & objectives: The purpose of the current study was to evaluate the prevalence of risk factors, symptoms, and short- and long-term outcomes of acute coronary syndromes in patients under the age of 45.

Material and Methods: The current study was a hospital-based, prospective, observational study that included both male and female patients between the ages of 13 and 45 who had been admitted for an acute coronary syndrome due to anginal pain, suggestive electrocardiographic changes, and elevated troponin-I levels/CPK-MB above the upper limit of normal.

Results: The study included a total of 100 instances of acute coronary syndrome in young adults who were admitted to a tertiary care facility's intensive care unit. In the current study, young people between the ages of 40 and 45 were the most prevalent age group (52 percent), followed by those between the ages of 30-39. (46 percent). The median age was 39.39 years plus 5.45. The majority of patients in the current study were male (78%) and female (22 percent). Chest pain (94%) and perspiration (88%) and dyspnea were the most frequent manifestations in the young group in this study (74 percent). Epigastric discomfort was the least often presenting symptom. In the current study, smoking and tobacco use were the most prevalent risk factor in young people (76%) followed by hypertension (64%) and high body mass index (62 percent). The least frequent risk factor was stress-induced type A personality disorder. In the current study, coronary artery disease and hypertension were the two most prevalent family histories among the young group (56 percent). and type 2 diabetes (30 percent). The most frequent ECG abnormalities in young adults in the current study were anterior wall infarction (42%), inferior wall infarction (28%), ST segment depression (14%), and Deep T wave inversion (8 percent), In the young group, STEMI (78%) and NSTEMI (22%) were the most frequent ECG alterations. In the current study, combined events (32 percent) were the most frequent hospitalizations, followed by LV failure (12 percent) and cardiogenic shock (10 percent) in the young group. After therapy, 49 patients are discharged. Arrhythmia, ventricular failure, pulmonary embolism, cardiac arrest, and reinfarction are all combined events.

Conclusion: Other significant modifiable risk factors in young individuals included use of oral tobacco, alcohol use, hypertension, diabetes, and dyslipidemia. Young individuals were also more likely to have other risk factors, such as a family history of early CAD.

Keywords: Oral tobacco consumption, hypertension, diabetes, dyslipidemia, premature CAD, adult coronary syndrome

**Corresponding author: Dr. Praveen Kumar Bugalia*

INTRODUCTION:

The most prevalent non-communicable disease in India is coronary artery disease, which is also the main cause of death in both developed and developing nations[1]. The term "acute coronary syndrome" (ACS), which includes "ST-segment elevation myocardial infarction" (STEMI), "non-ST-segment elevation myocardial infarction" (NSTEMI), and "unstable angina," refers to a group of potentially fatal conditions that develop when the blood supply to the heart is cut off because an atherosclerotic plaque that was once stable becomes unstable[2-4]. People of Indian descent are increasingly more likely to have cardiovascular risk factors for ACS, which is currently one of the most prevalent primary causes of mortality. The current lifestyle of some young people, which can be characterized by smoking, alcohol drinking, drugs like cocaine, amphetamine, high fat diet, fast food, and high work stress, contributes to the increasing incidence of ACS. In India, 25% of acute myocardial infarction occur in patients younger than 45 years of age. Heart disease prevention and treatment methods have undergone thorough assessment and have the potential to be very helpful[5]. Cardiovascular illness has a stronger evidence-based treatment than practically any other disease category. According to earlier research, ACS is becoming more common in young people. According to the evidence that is now available, young patients account for 0.4–19% of all ACS cases, depending on the age cutoff[6-8].

Aims & objectives: The purpose of the current study was to evaluate the prevalence of risk factors, symptoms, and short- and long-term outcomes of acute coronary syndromes in patients under the age of 45.

MATERIAL AND METHODS

The current investigation was an observational, prospective, hospital-based study carried out in the general medicine department of a medical college in Central India. The study lasted for 18 months. Prior to the start of the investigation, institutional ethics committee approval was obtained.

All patients between the ages of 13 and 45, of either gender, who are admitted for an acute coronary syndrome due to anginal pain, suggestive electrocardiographic abnormalities, and elevated troponin-I levels/CPK-MB above the upper limit of normal, meet the inclusion criteria.

Exclusion standards: Patients who are either younger than 13 or older than 45. patients with established congenital heart disease and advanced ischemic heart disease. Patients experiencing chest pain that is known not to be cardiac. Patients with confirmed ACS diagnoses who passed away earlier.

A written informed consent was obtained when the study's details were provided. The following laboratory investigations were noted: demographic information, clinical presentation (history and examination), electrocardiography findings and cardiac biomarkers. Each patient had the following tests: Complete Blood Count, CPK-MB-Between 12–16 hours of symptom start. If the first test is normal and there is a clinically high index of suspicion for ACS, repeat the test after 24 hours. , Electrocardiography (serial ECG monitoring), Homocysteine level, Fasting ESR (Wintrobe method), Urine routine and microscope examination, Renal function test, Liver function test, Serum electrolyte, Cardiac Troponin I-After 2 hours of symptom onset, 12 leads ECG, Random blood sugar (FBS and PPBS if diabetes and required), and lipid profile were employed within 24 hours after the onset of symptoms.

DIAGNOSTIC CRITERIA

Clinical presentation (history and examination): The main complaints were noted, along with their duration (chest pain, breathlessness, sweating, palpitations, vomiting, giddiness, abdominal pain, syncope), medical history/past history, risk factors (similar illness, diabetes mellitus, hypertension, anemia, history of taking any drugs, history of smoking in any form, obesity, dyslipidemia, past history of IHD), and personal and family histories. Clinical examination findings included blood pressure, weight, BMI, height, respiration rate, pallor, temperature, icterus, cyanosis, clubbing, symptoms of atherosclerosis, edema, and JVP. Other findings were blood pressure, weight, BMI, and height. thorough examination of the cardio-vascular system.

Electrocardiography findings and cardiac biomarkers –

Elevated troponin I levels, CPK-MB above upper limit of normal, and at least one of the following are required for the diagnosis of ACS (STEMI and NSTEMI):

1. Myocardial ischemia symptoms, such as epigastric discomfort, palpitations, dyspnea, and dyspnea with dyspnea,

2. The ECG develops pathologic Q waves

3. ECG ischemia-related alterations (ST segment elevation, depression, T wave inversion).

4. STEMI refers to cases of ischemic symptoms with elevated ST segments in electrocardiographic (ECG) leads and probable new-onset left bundle branch block.

5. If the cardiac biomarkers are positive, cases of ischemic symptoms without ST segment elevation are classified as NSTEMI.

Angina pectoris (or a similar sort of ischemia discomfort) with at least one of three symptoms and no rise in cardiac markers is referred to as unstable angina (UA).

1. Occurring at rest (or with little effort), typically lasting more than 20 minutes (if not interrupted by nitroglycerin administration)

2. Being intense, newly developing, and expressed as frank pain with exertion (i.e., within 1 month.)

3. Having a crescendo pattern, meaning it is more intense, protracted, or frequent than before.

Data was gathered and organized using Microsoft Excel, and descriptive statistics were used for statistical analysis.

RESULTS

The study included a total of 100 instances of acute coronary syndrome in young adults who were admitted to a tertiary care facility's intensive care unit. In the current study, young people between the ages of 40 and 45 were the most prevalent age group (52 percent), followed by those between the ages of 30-39. (46 percent). 39.39 5.45 years old was the average age. The majority of patients in the current study were male (78%) and female (22 percent).

Table 1: Age and gender distribution

Age group (in years)	Number (n)	Percentage (%)
13-20	0	0%
20—29	2	2%
30—39	46	46%
40-45	52	52%
Gender		
Male	78	78%
Female	22	22%
Ratio (M : F)	3.54 : 1	

Chest discomfort (94.0%), perspiration (88%) and dyspnea were the most frequent presentations in the young group of this study (74 percent). Epigastric discomfort was the least often presenting symptom.

Table 2: **Presenting symptoms**

Presenting complaints	Number (n)	Percentage (%)
Chest Pain without Radiation	94	94%
Chest Pain with Radiation	90	90%
Sweating	88	88%
Breathlessness	74	74%
Palpitation	40	40%
Vomiting	30	30%
Giddiness	24	24%
Epigastric discomfort	10	10%

In the current study, smoking and tobacco use were the most prevalent risk factor in young people (76%) followed by hypertension (64%) and high body mass index (62 percent). The least frequent risk factor was stress-induced type A personality disorder.

Table 3: **Risk factors**

Risk factors	Number (n)	Percentage (%)
Alcohol	48	48%
Smoking	58	58%
Tobacco Use	76	76%
Smoking + Tobacco Use	76	76%
Hypertension	64	64%
Diabetes Mellitus type 1 And type 2	30	30%
Stress induced/type a personality disorder	6	6%
Dyslipidemia	30	30%
Family history	56	56%
High BMI	62	62%
Chronic kidney disease	34	34%
Sedentary life style	40	40%
Sickle cell anemia	6	6%
High homocysteine level	14	14%

In the current investigation, coronary artery disease and hypertension were the two most prevalent family histories in the young group (56 percent). and type 2 diabetes (30 percent).

Table 4: Family history

Family history	Number (n)	Percentage (%)
Hypertension	64	64%
Diabetes Mellitus	30	30%
Coronary Artery Disease	56	56%

In the current study, anterior wall infarction (42 percent), inferior wall infarction (28 percent), ST segment depression (14 percent), and Deep T wave inversion (8 percent) were the most frequent ECG changes in young adults. STEMI (78 percent) and NSTEMI (22 percent) were the most frequent ECG changes in the older age group.

Table 5: **ECG findings**

ECG findings	Number (n)	Percentage (%)
ST elevation	78	78%
Anterior wall MI	42	42%
Inferior wall MI	28	28%
Lateral wall MI	2	2%
Anterolateral wall MI	6	6%
NSTEMI	22	22%
ST depression	14	14%
Deep T wave inversion	8	8%

In the current study, combined events (32 percent) were the most frequent hospitalizations, followed by LV failure (12 percent) and cardiogenic shock (10 percent) in the young group. 98 patients are released following therapy. Arrhythmia, ventricular failure, pulmonary embolism, cardiac arrest, and reinfarction are all combined events.

Table 6: Events And Outcome In The Hospital

Events And Outcome	Number (n)	Percentage (%)
Stroke	0	0%
LV Failure	12	12%
Recurrent Ischemia/Angina	2	2%
Cardiac Arrest	0	0%
Cardiogenic Shock	10	10%
Pulmonary Embolism	0	0%
Bleeding requiring Transfusion	0	0%
Death	2	2%
Combined events	32	32%
Discharge	98	98%

DISCUSSION

Two important factors prevent early detection of heart disease. First off, coronary artery disease is frequently latent and can progress to an advanced state before the patient experiences any symptoms[9]. Second, because there is a lack of diversity in the symptoms linked to cardiac disease, many illnesses may commonly manifest with the same symptoms. Coronary heart disease has long been stigmatized as an illness that only affects the elderly. Contrary to popular belief, acute coronary syndrome does not frequently affect young people[10]. Underdiagnosis of chest pain or epigastric discomfort brought on by an acid peptic illness or other musculoskeletal conditions results in incorrect patient care and misdiagnosis. When compared to the elder population, the prevalence of acute coronary syndrome (ACS) in young individuals is quite low[11].

Depending on the demographic investigated, the prevalence of young individuals under 45 years old among ACS patients varies and typically falls between 2 and 10%. Young people with CAD are more likely to smoke, have hypercholesterolemia, and have low levels of high-density lipoprotein (HDL)[12]. In addition, hypertriglyceridemia, obesity, and insulin resistance are risk factors for CAD in the young population. Patients ranging in age from 13 to 45 were included in our study. The age group of 40–45 years represented the majority of the young ACS patients (52 percent), followed by the 30-39 age group (46 percent). 39.39 5.45 years old was the average age[13]. This result is in line with research by Wei-Che Tsai et al., Sabiye Y et al., Ricci et al., and Saumya Gupta et al. who reported that the median ages for young adults were 35 years, 45.3 years and 6 years, 36.08 years, and 41.7 years and 4.1 years, respectively. The majority of the young ACS patients in our study were male (78%) and female (22%), which is consistent with Saumya Gupta et alfinding .'s that young adults had a male preponderance of 76.67% and a male: female ratio of 3.28:1. The studies by Wei-Che Tsai et al. and Sabiye Y et al., which revealed a male preponderance with 89.8% and 84.7 percent respectively, produced similar results. According to P. Yadav et alstudy, .'s young patients frequently presented with chest discomfort (94 percent), perspiration (78 percent), and dyspnea (67 percent) [14] Young ACS patients manifested with chest pain (85.05%), perspiration (61.68%), and breathing difficulties, according to Shah and Jain's findings (39.25 percent). Puricelb S et al. and Sarr et al. discovered that the proportion of young patients who experienced chest pain was 85 percent and 95.2%, respectively. In our study, smoking or chewing tobacco (76 percent) was the biggest risk factor for young adults, which is similar with Wei-Che Tsai et alfindings .'s that young individuals smoked 57.1 percent of the time[15-17]. The discovery observed by K. Matsis et al., Panduranga P et al., Chugh A et al., and Teixeira M. et al. that smoking rates were 47 percent, 47 percent, 77.24 percent, and 82.8 percent, respectively, among young adults, is likewise consistent with smoking as the biggest risk factor. Compared to the study by Chugh A et al., where only 36.6% of the study population was connected with alcohol as a risk factor in young people, the current study indicated that alcohol was a risk factor in 48 percent of young adults. The current study has identified a larger proportion of tobacco and smoking use. In our study of young individuals, hypertension was quite prevalent (64

percent) [18]. This result is in line with research by Chugh A. et al., Wei-Che Tsai et al., Teixeira M. et al., and Panduranga P. et al. who found that among young adults, hypertension was present in 27.64 percent, 29.8 percent, 28.9 percent, and 29 percent of cases, respectively. In our sample of young individuals, the prevalence of diabetes mellitus (30%) was also significantly greater. This is consistent with the findings of Shah and Jain and P. Yadav et al., who found that 16.5% and 20.45% of young adults had diabetes mellitus, respectively[19,20]. In the current study, 64% of young individuals with ACS had a history of hypertension in their families. This is consistent with the findings of Sabiye Yilmaz et al., K. Matsis et al., and Puricelb S et al., who found that 33.8 percent, 48.7 percent, and 44 percent, respectively, of young individuals with ACS had a family history of coronary artery disease. In contrast, Saumya Gupta et al., Sarr et al., and Panduranga P et al. found that 13%, 9.5%, and 16% of young ACS patients had a family history of coronary artery disease, respectively. In our study, anterior wall infarction was the ECG abnormality that affected young adults most frequently (42%)[21,22]. According to P. Yadav et al. and Deshpandey J.D. et al. as well as Shah and Jain, anterior wall myocardial infarction was the most prevalent kind in young people and the most common site of presentation (54 percent) (96.26 percent). STEMI (78 percent) among young adults accounted for the majority of ECG abnormalities in our investigation. Similar data were also reported by Shah, Jain, and Sarr et al., who found that young adults had STEMI rates of 98.13 percent and 85.7%, respectively. According to Chugh A. et al., Saumya Gupta et al., and Sabiye Yilmaz et al., the percentage of STEMI in young adults was 71.5 percent, 63 percent, and 49.3 percent, respectively. 12 percent of the young patients in our study experienced LV failure[23]. Chugh A et al. and Sabiye Yilmaz et al. published similar findings, reporting that the percentages of LV failure in young people were 13 percent and 13.1 percent, respectively. In contrast, Panduranga P et al. showed that young adults had an LV failure rate of 6%. In the current investigation, young individuals had a 10% percentage of cardiogenic shock. This result is in line with research by Chugh A et al. and Shah and Jain, who found that the percentage of cardiogenic shock in the young group was 8 percent and 6.54 percent, respectively. In the current study, the in-hospital mortality rate for young adults was 2%. Young adults had an in-hospital mortality rate of 7.4%, according to Tungsubutra W et al. In-hospital mortality rates for young adults were found to be 1.63 percent, 4.8 percent, 4.8 percent, and 3.36 percent, respectively, according to Chugh A. et al., Wei-Che Tsai et al., A. S. M. Zuhdi et al., and Singh Y et al. In our study, the death rate for young people was 2%. Among comparison to Ricci et al. and Sabiye Yilmaz et al., S. M. Zuhdi et al. reported that 1.3 percent and 1.2 percent of the patients had passed away at the 30-day follow-up in young adults, respectively. The present study's limitations included a small sample size, a short study duration, and its urban setting in a tertiary care hospital. It is advised to conduct additional in-depth multicenter studies with a larger sample size to corroborate the findings and put preventive measures into place for the benefit of society at large.

CONCLUSION

Other significant modifiable risk factors in young individuals included use of oral tobacco, alcohol use, hypertension, diabetes, and dyslipidemia. Young individuals were also more likely to have other risk factors, such as a family history of early CAD. Patients can be taught how to reduce their risk of developing ACS in both the young adult and older age groups by learning how to stop smoking, manage their diabetes and hypertension, and modify other risk factors.

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