Original Research Article

Acute coronary syndrome in young adult patients and its associated risk factors

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Abstract

Background: Acute coronary syndrome (ACS) is a major cause of morbidity and mortality. Young patients are more likely to have a history of smoking and dyslipidemia, but less likely to have other co-morbidities such as diabetes mellitus, hypertension. **Aim:** To analyse the frequency of different risk factors for coronary artery disease with focus on novel risk factors in young (≤ 40 years) population presenting with ACS in North East, India. **Material and Methods:** Patients aged 40 years or less than 40 years of age who were diagnosed as case of acute coronary syndrome on the basis of clinical history, examination, ECG changes and biochemical markers. **Results:** All the patients with ACS have at least one identifiable risk factor and 38 patients (76%) has multiple risk factors.Smoking was the most common risk factor (64%) followed by dyslipidemia (54%), obesity (36%), hypertension (30%),diabetes(28%), positive family history of IHD (18%). **Conclusion:** Preventive strategies focused on risk factor reduction, by lifestyle modification especially smoking cessation, weight reduction and dietary control should be implemented to protect young adults.
Key Words: Acute coronary syndrome, young adults, smoking, dyslipidemia, risk factors.

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Received Date: 10/01/2018 Revised Date: 30/01/2018 Accepted Date: 06/02/2018
DOI: https://doi.org/10.26611/1065210

Access this article online

Quick Response Code:

Website: www.medpulse.in

Accessed Date: 10 February 2018

INTRODUCTION

Acute coronary syndrome (ACS) is a major cause of morbidity and mortality. Worldwide, about 4% of patients presented with ACS are younger than 40 years of age.[1] The burden of ACS can be substantial if the individual is relatively young as they are commonly bread earner of the family and in the prime of their working life with significant contributions to the society. Cardiovascular risk factors for ACS are on the rise in people of Indian origin. Studies carried out in India and other places suggest that Asians in general and Indians in particular are at increased risk of Myocardial Infarction at a younger age (<40years).[1] Young patients are more likely to have a history of smoking and dyslipidemia, but less likely to have other co-morbidities such as diabetes mellitus, hypertension, or prior coronary artery disease and have fewer diffuse atherosclerotic coronary arteries arteries.[2] Interheart study proposed that hypertension, lipid abnormalities, smoking, obesity, diabetes, sedentary lifestyle, low fruit and vegetable intake, and psychosocial stress are important causes for MI in young in India.[2]So, this study was designed to analyse the frequency of different risk factors for coronary artery disease with focus on novel risk factors in young (≤ 40 years) population presenting with ACS in North East, India.

MATERIAL AND METHODS

This was an observational study conducted on young patients with acute coronary syndrome who attended the Medicine and the Cardiology departments in Gauhati Medical College and Hospital. A young patient was defined as one aged 40 years or less than 40 years of age on admission. The cases were grouped into two; viz. ST elevation MI (STEMI) and non ST elevation acute coronary syndrome (NSTACS includes NSTEMI/UA).

Inclusion Criteria

Patients aged 40 years or less than 40 years of age who were diagnosed as case of acute coronary syndrome on the basis of clinical history, examination, ECG changes and biochemical markers.

How to cite this article: Mareppa Kattimani, Tribeni Sarmah. Acute coronary syndrome in young adult patients and its associated risk factors. *MedPulse International Journal of Medicine.* February 2018; 5(2): 46-49. https://www.medpulse.in/Medicine/

Exclusion Criteria

Patients with age more than 40 yrs. Anthropometric measurements were also taken as Body Mass Index (BMI), waist circumference and waist: hip ratio.All the patients were evaluated through a thorough history, clinical examination and relevant investigations with special importance given to the cardiovascular function.

RESULTS

This study included a total of 50 patients. There were 41men (82%) and 9 women (18%) Out of 50 patients studied 9(18%) were females and the remaining 41(82%) were males. In this study of young ACS, the majority were male patients, there were 41 (82%) males and 9 (18%) females. Male to female ratio was 4.5:1. A total of 50 patients were studied. Their age ranged from 21 to 40 years and mean age was 35.7 years. Majority were in the age group 36-40 years (64%).followed by (26%) who were in age group 30 -35years and (6%) were in 21–25 years, (4%) in 26–29years and 1 case in age group 20–25 years. Mean age of ACS patients in male was 35.9 years, in female it was 34.6years.

Table 1: Body Mass Index

BMI(Kg/m2)	No. of Patients	%
<22.9(Normal)	2	4%
23.0 -24.9(Overweight)	30	60%
≥25(Obese)	18	36%

2 patients (4%) out of the total 50 had a normal BMI (<22.9). 30 patients (60%) had overweight BMI between 23.0-24.9 kg/m2. 18 patients had obesity (36%) had BMI ≥25 kg/m2.

Table 2: Distribution of waist circumference and Waist: Hip ratios

	No. of Patients	%
Waist Circumference	28	
Male >90cm	Male -23	56%
Female >80cm	Female -5	
Waist: Hip ratio	32	
Male >0.8	Male -26	64%
Female >0.9	Female -6	

Waist circumference was found to be >90 cm in 23 male pts and >80 cm in 5 female patients. Waist to hip ratio was found to be > 0.9 in 6 female patients and >0.8 in 26 male patients.

Table 3: Distribution of Risk Factors

Risk factors	No. of patients	Percentage
Smoking	32	64%
Dyslipidemia	27	54%
Diabetes	14	28%
Obesity	18	36%
Hypertension	15	30%
Family History of IHD	09	18%

All the patients with ACS have at least one identifiable risk factor and 38 patients (76%) has multiple risk factors.

Table 4: Risk Factors

Risk Factors	No. of Patients	Percentage
No Risk Factors	0	0%
Single Risk Factor	12	24%
Multiple Risk Factors	38	76%

Smoking was the most common risk factor (64%) followed by dyslipidemia (54%), obesity (36%), hypertension (30%),diabetes(28%), positive family history of IHD (18%).Smoking emerged as single most important risk factor for ACS in young patients. Of the total patients 64% of the patients (32 patients) were smoker. 18 patients had 5 -10 pack years of smoking.14 patients were found to have abnormal HBA1C. Number of patients with elevated total cholesterol was 18, 10 patients had borderline high (200-239) and 8 patients had high value of (240 and above). Number of patients with LDL cholesterol elevation was 22, 10 had values between 100 -129, 3 had borderline high (130-159) and 7 had high (160-189) and one patient had very high (190 and above). Number of patients with elevated triglycerides was 18. 5 patients had values between 150-200, 8 patients had values between 251-300 and 5 patients had values 300 and above. 20 patients had reduced HDL as the only lipid abnormality (Less than 40 in males and less than 50 in females.) Positive family history of IHD found in 9 patients.

DISCUSSION

This was a hospital based observational study of 50 patients aged 40 and below admitted with a diagnosis of acute coronary syndrome. An age cut off of 40 years was selected to define a premature coronary artery disease based on previous epidemiologic studies. ACS in young was found to be more common in males as compared to females. In our study 82% of patients were males, 18% were females (Male and female ratio is 4.5:1). Similar observations have been made in other studies also i.e. Dwivedi *et al* (4:1).[3] In a study by Wong *et al*, there were 94% males with very high 33.3:1 male to female ratio in Indian subgroup.[4] The young patients with ACS, most common risk factor was smoking (64%),followed by dyslipidemia (54%), obesity (36%),hypertension (30%) and diabetes (28%). Similar to study done byAl‑Khadra *et al*,[5] most common risk factor was smoking (76.9%), dyslipidemia (33.8%) and hypertension (18.5%). In this study, all the patients with ACS have at least one identifiable risk factor and 38 patients (76%) has multiple risk factors. Out of 50 patients of young adults with ACS 32(64%) patients were smokers. Similar observations have been made in earlier studies i.e. Dwivedi *et al*

(61.42%),[3] Jeyachandran *et al* (53%),[6] Gupta *et al* (89%).[7]Smoking was found to be the main risk factor and is often found in the occurrence of coronary events in young patients. Indeed, most works on the occurrence of coronary syndrome in young patients have a disease pattern dominated by monotonous smoking. Majority of patients in this study were diagnosed with diabetes, hypertension and dyslipidemia after an attack of ACS. Hence, it is important to diagnose and treat these conditions at an early stage before they can lead to such devastating complications. Dyslipidemia was present in 27 patients (54%) in this study. It was the second common risk factor in this study which is comparable with a study by Al‑Khadra *et al*.[5]Sricharan KN *et al* found dyslipidemia as the second common risk factor (36.67%).[8] LDL cholesterol were raised in 22 patients (44%). It can be seen that the incidence of myocardial infarction increased with increasing levels of LDL cholesterol. Similar observations have been made in other studies i.e. Biswas PK *et al* (30.6%)[9] and David JE *et al* (68%).[10] The importance of dyslipidaemia in the pathogenesis of CAD is well known. Elevated levels of cholesterol, LDL-C and triglycerides have been found in young Indian subjects with CAD and been postulated to be of particular importance even in the younger variant of the disease.[11-13]It can be postulated that metabolic profile of patients have deteriorated over time and a possible explanation could be degradation of lifestyle habits with greater consumption of junk foods by the young population. Hypertensionis firmly established as a modifiable risk factor for coronary artery disease. In this study 15 patients of ACS(30%) had hypertension, the probable reason being the accelerated atherosclerosis. Similar observations have been found in other studies also i.e. Dwivedi *et al* (51.42%)[3] and Marty AK *et al* (28%).[14] Diabetes mellitus is also a major coronary artery disease risk factor. In this study 14 patients (28%) were found to have diabetes. Similar observations have been made in other studies also i.e. Dwivedi *et al* (7.14%)[3] and MartyAK *et al* (18%).[14] HbA1c were significantly higher, suggesting that a higher proportion of patients had undetected diabetics or prediabetes. The findings of this study show that, HbA1c is an independent risk factor, indicating that HbA1c is more strongly correlated with ACS in young people. Obesityis an independent and modifiable risk factor for coronary artery disease in both men and women. In this study 14 of patients (28%) were found to have obesity. Similar observations have been made in other studies also i.e. Dwivedi *et al* (35.71%)[3]and PK Biswas (9.7%)[9].Central obesity is associated with an atherogenic lipid profile. In this study 34 patient (64%) has central obesity. Out of 41 men, 28 patients (%) had waist to hip ratio > 0.8. Out of 9 women, 6 patients (66.6%) had waist to hip ratio > 0.8. Similar trend was found in study done by Bhargavi Devi M *et al*.[15] Family history of coronary artery disease is also one of the non-modifiable risk factors. In this study, 9 patients (18%) had family history of coronary artery disease. Similar observations have been made in other studies i.e. Dwivedi *et al* (42.8%),[3] Biswas PK *et al* (11.3%),[9] and Marty AK Das *et al* (28%).[14]A positive family history of IHD had been found as a significant cause only among the young adults as compared to the older patients in earlier studies.[16,17] Preventive strategies focused on risk factor reduction, by lifestyle modification especially smoking cessation, reduction of salt intake, weight reduction, increase physical activity, and dietary control, should be implemented to protect young adults in the most productive years of their life. The lack of warning signs stresses the need for primary preventive measures.

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Source of Support: None Declared
Conflict of Interest: None Declared