

A study of Risk Factors in Young Patients of Acute Coronary Syndrome

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ABSTRACT

Introduction: Acute coronary syndrome is a common clinical condition encountered among younger age group in recent years. Young patients have different risk factors, clinical features and prognosis as compared to elderly patients. It constitutes an important problem because of the devastating effect of this disease on the more active lifestyle of young adults. This study was an attempt to look for the risk factors most prevalent in young patients and its outcome during the hospital stay.

Materials and methods: In this prospective study, 30 patients younger than 40 years of age with clinical and electrocardiographic evidence of Acute Coronary Syndrome admitted in our hospital were studied over a period of 8 months and risk factors analysed.

Results: 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%). Most of the patients (83%) had 3 or more risk factors. In our study, 1 patient was expired.

Conclusion: We concluded that Acute Coronary Syndrome in people younger than 40 years showed a significant male predominance with sedentary lifestyle being major modifiable risk factor in our population. Other conventional risk factors are also prevalent but OC Pills intake is not a major health problem for us. The morbidity and mortality increased with a combination of risk factors.

Keywords: Acute Coronary Syndrome; Electrocardiogram; Outcome; Risk Factors; Young Adults .

INTRODUCTION

Coronary artery Disease is now becoming a leading cause of death throughout the world.¹ Acute coronary syndrome (ACS) is among the main causes of hospital morbidity and mortality in western countries.²⁻⁴ Cardiovascular risk factors for acute coronary syndrome (ACS) are on the rise in people of Indian origin.⁵ In upcoming few years, more than half of the worldwide cardiovascular disease risk burden will be borne by India as per the records of recent epidemiological studies.²

Moreover people in the world suffer from coronary artery disease at relatively younger age.¹ Young age patients have different risk factor profile, clinical presentation, pattern of coronary artery involvement and clinical outcome than older patients. A variety of other possible contributing factors that include substance abuse, coronary artery anomalies, hypercoagulable state, oral contraceptive use in

young women have been implicated for the pathogenesis of myocardial infarction in young patients.³ ACS at an early age constitutes an important problem for the patient as well as the consulting physician as it has devastating effects on the quality of life and survival of young adults.

For better management of this specific problem, it is important to evaluate the risk factors in detail and try to modify them.³

As very little data is currently available regarding the prevalence of different risk factors for ACS in our younger population, this study on risk factors in young patients of Acute Coronary Syndrome was planned which would help in better management and prevention of ACS in this population. This study had been undertaken to identify the cardiovascular risk factors associated with the incidence and prognosis of patients younger than 40 years of age who are hospitalized for Acute Coronary Syndrome and to look for the number of risk factors present in each patient.

MATERIAL AND METHODS

This prospective study was carried out in 30 young patients (18-40 years of age) with diagnosis of Acute Coronary Syndrome admitted to Sir Takhtsinhji General Hospital, Bhavnagar, Gujarat, India over a period of 8 months after taking permission from Institutional Review Board, Human Ethics Committee, Government Medical College, Bhavnagar. Detailed history was taken in each patient and information of every patient was recorded in a separate proforma. Informed consent was obtained from all patients. The serum cardiac enzyme level was measured and ECG was done at the time of admission and repeated as necessary.

All patients from 18-40 years of age diagnosed as Acute Coronary Syndrome according to current guidelines, were included in the study.

All patients with stable angina, cerebrovascular disease or stroke, acute or chronic liver disease, renal impairment or age less than 18 or above 40 years were excluded from the study. Patients having prior cardiac conditions that could affect outcome like valvular heart disease, cardiomyopathy,

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and previous left bundle branch block were also excluded.

Risk factors studied in these patients are given below

Patients were considered to have positive family history of premature coronary artery disease if they had history of ACS or sudden death in father or first degree male relatives before 55 years of age or ACS or sudden death in mother or other 1st degree female relatives before 65 years.

Patient who smokes any tobacco product daily or occasionally or left smoking within 3 months of the diagnosis was considered as smoker.

Patients having blood pressure greater than 140 mmHg systolic or 90 mmHg diastolic on at least two occasions or already receiving any antihypertensive medications were considered hypertensives.

Patients already on antidiabetic medications or having fasting blood sugar >126 mg/dl or random blood sugar >200 mg/dl were considered diabetic.¹

Dyslipidemia was defined as history of dyslipidemia diagnosed and/or treated by a physician or total cholesterol greater than 5.18 mmol/l, low-density lipoprotein greater than or equal to 3.37 mmol/l, or high-density lipoprotein <1.04 mmol/l. High triglyceride (TAG) level was defined as level more than 2.3 mmol/L.³

Obesity was defined as having body mass index equal to or greater than 30 kg/m2.

Patients consuming diet rich in fat or saturated fats were considered to have unhealthy diet and those consuming less fat or saturated fat and high fibre diet were considered to have healthy diet.

Patients having alcohol consumption of more than 1–2 ounces of ethanol per day were considered alcoholic.

Patients were asked about the use of Oral contraceptive pills at present or within 3 months of the diagnosis of ACS.

Patients walking 4 Km/day for 5 times a week were considered to have physically active lifestyle while those walking less than this were labelled as physically inactive or sedentary.¹

The patients were also asked about the oral tobacco addiction.

STATISTICAL ANALYSIS

Microsoft office 2007 was used for the analysis. Descriptive statistics like mean and percentages were used for the analysis.

RESULTS

The results thus obtained showed that out of 30 patients studied only 9 patients were below 30 years of age, rest 70% patients fall between 31- 40 years of age. Mean age was 35 years. There was a male preponderance with 76.67% males and only 23.33% females.

Most of the patients (73%) had sedentary lifestyle and 50% had dyslipidemia. 40% patients were taking diet rich in fats, 37% patients were diabetic, 33% were hypertensive, 37% patients consume oral tobacco, 30% were smokers, 13% were obese and 17% were alcoholics. Family history of premature coronary artery disease was present in only 13% of cases. In our study, none of the patients had consumed oral

contraceptive pills. (Table 1) (Figure 1).

Above findings indicate that most common risk factors are sedentary lifestyle, dyslipidemia and male sex.

This relative frequency of risk factors is further illustrated in Table 2, which shows that most of the patients, i.e., 53.33% had 3-5 risk factors contributing to ACS.

In our study, 27% patients had unstable angina, 63% patients had ST elevation myocardial infarction, 10% patients had non-ST elevation myocardial infarction. Most common type of ACS in young patients is ST elevation MI. (Figure 2). One patient was expired during the hospital stay.

DISCUSSION

In our study, the observations made in 30 patients of Acute Coronary Syndrome are discussed and compared with other studies.

The youngest age of patient with ACS in this study was 21 years and the oldest was 40 years. The majority of ischemia/ infarct occurred in age group between 31-40 years and only

S. No.	Risk Factors	No. of Patients	%
1.	Male sex	23	77%
2.	Positive Family history	04	13%
3.	Diet rich in fat or saturated fats	12	40%
4.	Obesity	04	13%
5.	Sedentary lifestyle	22	73%
6.	Diabetes	11	37%
7.	Hypertension	10	33%
8.	Dyslipidemia	15	50%
9.	Alcohol consumption	05	17%
10.	Smoking	09	30%
11.	Oral Tobacco addiction	11	37%
12.	OC Pills intake	0	0%

Table-1: Risk factors in the present study

Number of risk factors	No. of patients	Relative frequency
0-2	5	16.60%
3-5	16	53.33%
6-9	9	30%
10-12	0	0%

Table-2: Relative frequency of number of risk factors

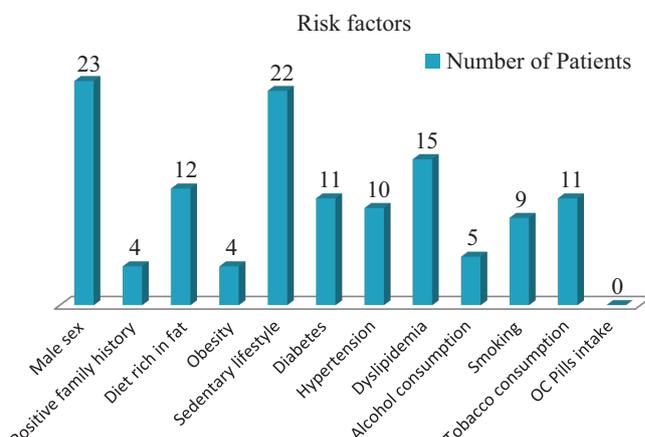


Figure-1: Comparison of risk factors in present study

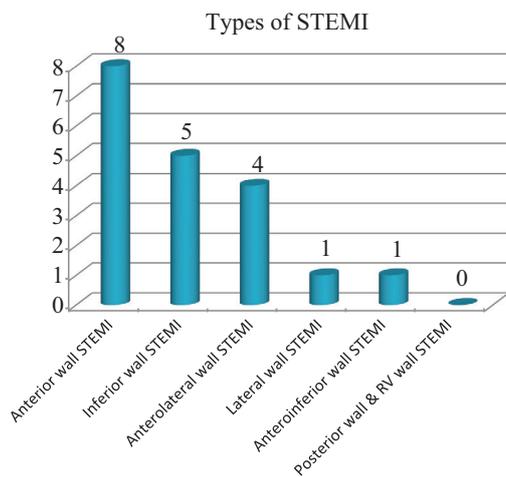


Figure-2: Types of ST elevation ACS

9 patients were below 30 years of age. The average age was 35 years. This correlates with the observation made by Tamrakar R et al³ and Abdul Wajid et al.¹

In our study 77% of patients were male. This finding is consistent with the study of Akhtar et al, who showed 85% of their patients as male in their study.¹ Male predominance also correlates with the observation made by Tamrakar R et al; Abdul Wajid et al; PS Singh et al and P. Yadav et al.^{3,1,5,2} Family history of CAD has an increased risk of premature coronary events. Present study showed that 13% of patients had family history of premature CAD, whereas Akhtar et al showed 57%¹ and Tamrakar R et al showed 33% patients having family history of premature CAD. This difference between the results is probably because of the difference in sample size selected. It is 109 patients in Akhtar et al study⁶, 100 patients in Tamrakar R et al³ study and 30 patients in our study.

There is no concept of balanced diet in our population. We found out that 40% of our patients were not taking risk free diet, and most of them were taking ghee (classified butter) regularly in excessive amounts. Thomas et al has reported high risk of IHD in Indians attributed to the consumption of ghee.¹

Obesity is itself an independent risk factor for ACS in both men and women. But in present study only 13% of patients were obese. This small proportion is because of the fact that in our study most of the patients were labourers who belonged to poor socioeconomic status. This correlates with Abdul wajid et al¹ study in which only 17% of patients were obese and Tamrakar R et al³ (4.3% obese) and most of the patients in these studies also belonged to poor socioeconomic status.¹ We found 73% of our patients sedentary, which is a significant number, keeping in view the younger population we selected for the study. This is in contrast with Abdul wajid et al¹ study in which only 26% of patients were sedentary but correlates with Deshpande et al study⁷ in which sedentary lifestyle was significantly associated with the risk of ACS. This indicates that lifestyle modification is one of the most common modifiable risk factor for ACS.

We found 37% of the patients to be diabetic in our study. Gandapur et al reported 14% and Akhtar et al reported 35.7%

of their patients to be diabetic in their study. The results of our study relates very closely to the Akhtar et al study, because they also selected patients below 40 years of age, contrary to the age group selected in Gandapur et al study.¹ Alcohol intake is not an important risk factor in our society and present study proves it to be so as only 17% patients had history of alcohol consumption. This correlates with Abdul Wajid et al study in which only 3% patients were alcoholic.¹ In present study 33% of patients were hypertensive. However the study conducted by Akhtar et al in 1993 on young patients of IHD found 47.6% hypertensive patients.¹ This difference is probably because Akhtar et al study included all the patients with IHD whereas our study included only those patients who had ACS, but not the stable angina. Another reason is that obesity has also contributed to hypertension in Akhtar et al study, as almost half of their patients were obese whereas most of our patients belonged to poor socioeconomic status and only 13% were obese.

Dyslipidemia is one of the major modifiable IHD risk factor. Akhtar et al reported dyslipidemia in their 63.2% of patients. In our study 50% patients had dyslipidemia. The similar results were found in Gandapur et al study. Sedentary lifestyle seems to be contributing to the increased prevalence of dyslipidemia in our population.¹ A meta-analysis of 16 prospective epidemiologic studies suggests that an elevated triglyceride concentration is an independent risk factor for coronary artery disease. So, we may infer that high triglyceride level, which may be the primary lipid abnormality with or without low HDL levels and normal/low LDL levels is a matter of concern in young adults.³

In present study 30% of patients were cigarette smokers. Study by Zimmerman et al found that among Acute myocardial infarction patients <40 years old 73% to 90% reported a history of smoking. Many other studies have also found high rates of smoking among young patients who have Acute myocardial infarction, with percentages ranging from 70% to >90%.³ Smoking was the leading risk factor (65%) as seen in the study by Yusuf et al.⁵

All these evidence point out smoking as an important modifiable risk factor and preventable cause of CAD in young adults.^{1,3} So we support the conclusion that tobacco control programs could have an important contribution in preventing and decreasing the incidence of ACS in our young adults.

In our study, 37% of patients had oral tobacco addiction. Not much studies were done previously on relation between oral tobacco addiction and development of ACS. But interestingly we found that there is a positive correlation between oral tobacco addiction and developing ACS in young age (37%). Use of OC pills was considered as one among the risk factors in most of the studies, but in present study none of the participant has used OC pills. This correlates with the observations made by Abdul wajid et al.¹ Thus OCPs intake is not an important risk factor in our society.

Clustering of different risk factors of ACS predisposes the patient to premature CAD. In Akhtar et al study, 55% of patients had 3 or more risk factors, whereas 70% of patients in

our study had 3 or more risk factors. The observed difference exists because we studied twelve risk factors against six risk factors studied by Akhtar et al. Therefore we conclude that as the number of risk factors increase in an individual, the risk of IHD and Acute Coronary Syndrome also increases, and the patient develops ACS at an early age.¹

Here in this particular set of study population, obesity, OCPs intake, alcohol consumption and positive family history are less common, so they are confounded as minor risk factors, though some of them are major risk factors in most of the other studies.

Smoking is a well known major risk factor for developing ACS, but in our study group, most of the people are addicted to oral tobacco, without cigarette smoking, and interestingly we found that oral tobacco addiction has a positive correlation with development of ACS in young age (37 %).

Limitation

This study was conducted in a short period of time and acute coronary syndrome in young age that too in a low socioeconomic group is very uncommon so the sample size of the study is small (n=30).

This study was conducted in an urban set up in a tertiary care hospital, but most of the patients are of low socio economic group; this is the main confounding factor in our study.

CONCLUSION

Young patients (at or below 40 years of age) diagnosed with ACS have some important differences that should be appreciated. The most important modifiable risk factor is sedentary lifestyle. Commonest non modifiable risk factor is Male sex. STEMI is most common type of ACS in young adults. Smoking, oral tobacco consumption, hypertension, diabetes, dyslipidemia, and diet modification are other important modifiable risk factors in young adults. Other risk factors such as obesity and family history of premature CAD are also prevalent in young ischemic patients but alcohol consumption and OCPs are not commonly seen in young ACS patients and thus not a major health problem for us. The presence of more than one risk factor particularly three or more risk factors in an individual predisposes to ACS at relatively younger age. Improving lifestyle is a goal of the first magnitude in these patients. If timely managed, young patients with ACS have favourable inhospital prognosis.

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