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Original Research Article

Analysis of prevalence of risk factors in patients aged ≤ 45 years presenting with acute coronary syndrome

Anish Patel[*1], Sunil Thanvi [2] and Utsav Patel[2]

[1]*Shivam Pharmaceutical Studies and Research Centre, Valasan, Gujarat, India*
[2]*B and M Patel Cardiac Centre, Shree Krishna Hospital, Karamsad, Gujarat, India*

QR Code

***Correspondence Info:**
Anish Patel,
Shivam Pharmaceutical Studies and Research Centre,
Valasan, Gujarat, India

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Abstract

Objective: 1) To examine the relationship between the life style and co-morbid conditions in patients having age of ≤ 45 years presenting with Acute Coronary Syndrome. 2) Effect of the risk factors on Acute coronary syndrome i.e. Non – ST Segment Elevation Myocardial Infarction, ST Segment Elevation Myocardial Infarction, or Unstable Angina.

Methods: Data were analyzed from 52 Acute Coronary Syndrome patients admitted at the Intensive Care Unit of B and M Patel Cardiac Centre, Shree Krishna hospital during from October 2013 to March 2014, as part of the research objective. Acute Coronary Syndrome patient's ≤ 45 years of age diagnosed with Non-ST Segment Elevation Myocardial Infarction, ST Segment Elevation Myocardial Infarction, or Unstable Angina were enrolled.

Results: A total of 52 patients were ≤45 years of age with mean age of 31.50 ± 1.555 years in young adults ($p<0.001$). More men were seen in the younger age group (79%, 41) compared to women (21%, 11). Among all the coronary risk factors, young patients had more history of smoking (71.15%), hypertension (34.61%), and inactive lifestyle (34.61%), and diabetes (21.15%), and alcohol consumption (28.84%) than obesity (3.84%), poor socioeconomic class (13.46%), stress (3.84%), hypercholesterolemia (5.76%) and family history of coronary artery disease (cad) (5.61%). Male patients had higher prevalence for tobacco consumption (3.03), and inactive lifestyle (1.536) compared to females having hypertension (1.11) and diabetes (1.398). Younger patients in India are more likely to have ST Segment Elevation Myocardial Infarction than Non-ST Segment Elevation Myocardial Infarction (1.44) or Unstable Angina (3.5) and the most prevalent risk factors for ST Segment Elevation Myocardial Infarction patients were tobacco consumption (1.77) Physical inactivity (5.5) and hypertension (2.5) compared to patients with Non-ST Segment Elevation Myocardial Infarction.

Conclusions: Young patient's ≤ 45 years of age presenting with Acute Coronary Syndrome have different risk profile. However, in young patients with ST Segment Elevation Myocardial Infarction, tobacco consumption along with inactive lifestyle and history of hypertension were strong risk factors. There is a need for prevention programs to control smoking and modifying lifestyle of young adults in the population.

Keywords: Acute coronary syndrome, ST Segment Evelvation Myocardial Infarction, tobacco consumption, young adults.

1. Introduction

India has the highest burden of Acute Coronary Syndrome (ACS).**[**1**]** Coronary Artery Disease(CAD) occurs in Indians 5-10 years earlier than in other populations around the world and the major effect of this peculiar phenomenon is on the productive work force of the country aged 35-65 years.[2**]** The rising incidence of ACS in Indians may be related to the changes in the life style, the westernization of the food practices, the increasing prevalence of diabetes mellitus and probably genetic factors. ACS are the commonest cause of the mortality in patients with CAD **[**3**]** The estimation of risk in ACS involves incorporating information from several prognostic variables which include history, physical findings, Electrocardiogram(ECG) changes and troponin.**[**4**]**

The working diagnosis of ACS is based upon the clinical and ECG characteristics which guide immediate management. The subsequent clinical course and appropriate laboratory tests will lead to a final diagnosis which could be ST Segment Elevation Myocardial Infarction (STEMI), Non-ST Segment Elevation Myocardial Infarction (NSTEMI), Unstable Angina (UA), stable angina or another cardiac or non- cardiac condition.**[**5**]**

The resting 12-lead ECG is the first-line diagnostic tool in the assessment of patients with suspected Non-ST Segment Elevation Acute Coronary Syndrome(NSTE-ACS).**[**6**]** The characteristic ECG abnormalities of NSTE-ACS are ST-segment depression or transient elevation and/or T-wave changes.**[**7**,**8**]**

Cardiac troponins play a central role in establishing a diagnosis and stratifying risk, and make it possible to distinguish between NSTEMI and unstable angina. Troponins are more specific and sensitive than the traditional cardiac enzymes such as creatine kinase (CK), its isoenzyme MB (CK-MB), and myoglobin. Accordingly, troponin may be seen as a surrogate marker of active thrombus formation.**[**9**]** After the initial phase, patients with STEMI carry a high risk of Ischemic events. Therefore active secondary prevention is an essential element of long term management.**[**10-12**]**

Epidemiological studies (largely cross-sectional surveys) from various parts of India have reported the rising trends and a high burden in the levels of conventional risk factors such as diabetes, hypertension and metabolic syndrome which are largely determined by urbanization as evident from the urban-rural difference in the risk factors observed in India.**[**13-15]

Essentially, the Asian Indians are in double jeopardy from nature and nurture-nature, among other things, being the genetically-determined excess of insulin resistance and diabetes, and nurture, being an ever-increasing unhealthy lifestyle associated with rising affluence, urbanization, and mechanization.**[**16**]**

For patients who smoke, persistent smoking cessation counseling is often successful and has substantial potential to improve survival.**[**17] Maintenance of a healthy weight is also important. If patient consumes alcoholic beverages, contemporary recommendations call for moderation (one to two alcoholic beverages per day) as an excessive intake is associated with hypertension, stroke, cardiomyopathy, and increased total mortality **[**18] As, Moderate alcohol intake has been associated with reduced cardiovascular events in many populations.**[**19**]**

Hypertension is a serious public health problem, causing almost 13% of all deaths worldwide and 17% of all deaths in high income countries **[**20]. Heavy alcohol consumption is associated with an increased risk for hypertension **[**21**]**, and hypertension in itself is a major risk factor for coronary heart disease **[**22].

Regular physical activity is essential for maintaining physical and cardiovascular fitness, maintaining healthy weight, and sustaining weight loss once achieved.**[**23]

Obesity is an independent risk factor for Cardiovascular Diseases (CVD). A healthy body weight is currently defined as a body mass index (BMI) of 18.5 to 24.9 kg/m^2. Overweight is a BMI between 25 and 29.9 kg/m^2, and obesity is a BMI 30 kg/m^2.**[**24]

It is well recognized that individuals of lower socioeconomic status (SES) have a higher incidence of CVD than do individuals of higher socioeconomic status. Population subgroups of racial/ ethnic minorities (e.g., Mexican Americans, American Indians, and blacks), who are overrepresented in lower socioeconomic status groups, have a strikingly high prevalence of overweight and obesity-a condition that precedes the development of many other CVD risk factors.**[**25**,**26**]**

The current challenge to healthcare providers, researchers, and government officials is to develop and implement effective clinical and public health strategies that lead to sustained lifestyle changes among individuals and, more broadly, among populations. Strategies must include not only innovations in diagnosis and treatment but also fresh approaches to motivating lifestyle changes, leading to improved diet, weight control, physical activity, and tobacco avoidance, as well as to better compliance with evidence-based medical therapies**[**27].

This study helped us to explore the factors that carry intensive risk to the young patients with ACS, as various prior studies claimed the association of the secondary risk factors in middle aged patients. The prevalence and implication of these life style risk factors in young patients (aged ≤45 years) presenting with ACS gave apt information about their effect on an ACS event i.e. STEMI, NSTEMI, and UA.

2. Methodology

2.1 Study Setting and Designs

This Prospective cross-sectional study was undertaken at Bhanubhai and Madhuben Patel Cardiac Centre, Shree Krishna hospital and medical Research Centre, Karamsad.

This study was conducted post approval from Human Research Ethics Committee (HREC) at H M Patel Centre of Medical Care and Education of Shri Krishna Hospital, Karamsad involving patients aged ≤ 45 years who were admitted, diagnosed or suspected with acute coronary syndrome. A witnessed and written informed consent was obtained from all the patients. We have enrolled 52 subjects over a period of 5 months.

Cases confirmed by the electrocardiogram and diagnostic enzyme changes as an ACS event (STEMI, NSTEMI, UA) were alone included and recorded. Patients with acute coronary syndrome (STEMI, NSTEMI and/or unstable angina) with the age ≤ 45 years were interviewed and the data was recorded after obtaining the written consent in the language (English, Gujarati) preferred by the patient.

2.2 Operational definition of risk factors

Blood Pressure: The Blood pressure was recorded as per WHO guidelines (at least 2 readings at 5 minutes intervals). If high Blood Pressure (> 140/90 mmHg) was noted a third reading was taken after 30mins. The lowest of the three readings was taken as Blood Pressure. **[**28**]**

Electrocardiogram: Electrocardiogram was performed on all persons using proper standardization. **[**28**]**

Criteria for obesity: Body Mass Index [weight (kg) / height (square. meter)] was calculated and obesity was defined as BMI > 30 kg/m^2. **[**28**]**

Criteria of smoking: Smoking criteria considered for this study include as to whether the person is regularly smoking 1 cigarette or 4 beedis daily or stoppage of smoking only within past 12 months **[**29**]**

Criteria for Alcohol consumption: In India one small peg is 30 ml (equivalent to one European drink) and large peg is 60 ml which is equivalent to two European drinks. Therefore harm outweighs the benefits among those who consume two pegs of alcohol in India. Those consuming less than 3 drinks/week were classified as light drinkers whereas women with 3-7 drinks/week and men with 3-14 drinks/week classified as moderate drinkers. **[**30**]**

Family History: A positive family history for CAD was defined as evidence of CAD in a parent, sibling, or children before 55 years of age.**[**31]

Physical Inactivity: patients who do not report light or moderate activity for at least 10 minutes a day were considered to be having a sedentary lifestyle. Sedentary activities include sitting, reading, watching television and computer use for much of the day with little or no vigorous physical exercise.

Diabetes mellitus: The patient who has past history of drug treatment for diabetes mellitus will be considered diabetic and will be included in this study. No history was taken as to diet treatment, type of drug treatment or duration of diabetes. Thus in this study, patient who indicated they were not taking medication for diabetes were identified as patient without diabetes **[**32**]**.

Vegetarian:

(1) A lacto-ovo-vegetarian consumes dairy products and eggs but no meat, poultry, or seafood;

(2) A lacto vegetarian eats dairy products but not eggs, meat, poultry, or seafood;

(3) An ovo-vegetarian eats eggs but no dairy products, meat, poultry, or seafood; and

(4) A vegan does not eat any animal products, including meat, fish, poultry, eggs, and dairy products; many vegans will also avoid honey.**[**33**]**

2.3 Statistical Methods

Clinical Characteristics such as age, sex, diet, physical inactivity, weight, height, history of hypertension, tobacco consumption, alcohol consumption, diabetes and patient's family history were recorded in the proforma.

Data were analyzed in following ways to elicit the relationship between the risk factor prevalence and their effect on the ACS event.

- Risk Factor distribution by age of patient
- Classification of patients based on number of risk factors present
- Gender based life style risk factor distribution
- Total number of patients with risk factor/s and/or with/without co morbid conditions
- Effect based classification (STEMI, NSTEMI, UA) - age group associated, gender based, risk factor associated.

Descriptive statistics was employed for all the dependent and independent categorical variables. Odds ratio, frequencies and percentages were reported and statistical software prism graph pad was used for other data analysis.

3. Results

A total of 52 patients (male=41, female= 11) with their ages in the range from 18-45 years were enrolled. Table 1 show that most patients were in the age group of 41-45 years and its graphical representation in figure 1 suggests a linear relationship between the age and number of patients with an ACS event. Age is an independent risk factor for the occurrence of ACS event. The Gender distribution (figure 3) suggests that males were 3.76 times more compared to the females.

The unpaired t-test (figure 2) for the age wise patient distribution gave a p value <0.0001 with the means significantly different with P<0.05. The statistical method applied gave Mean ± SEM of Age was 31.50 ± 1.555, for N=28 and Mean ± SEM for number of patient was 1.857 ± 0.4899 for N=28. The difference between means was found to be 29.64± 1.6340 with the 95% confidence interval in the range from 26.37 to 32.91. The variances obtained were significantly different.

Patient- Risk factor distributions (Table 2) suggested that the most prominent risk factor was tobacco consumption 37(71.15%) followed by history of hypertension and inactive life style 18(34.61%), diabetes 11(21.15%), alcohol consumption 15(28.84%), poor socio economic class 07(13.46%), family history 05(9.61%), hypercholesterolemia 03(5.76%) and least number of patients i.e. only 2(3.84%) were obese or admitted to having stress.

The most prevalent Risk factor (Table 3) in males was tobacco consumption (82.9%) followed by the 36.58% with a history of inactive lifestyle and alcohol consumption. The males and females were almost equally hypertensive with 34.14% and 36.36% respectively. In females, history of tobacco consumption, diabetes mellitus, inactive life style and family history was about 27.27%. It was observed from the data that alcohol consumption and obesity was

prominent only in the male patient and the role of alcohol consumption in the females cannot be well established through this study, which can be due to the cultural restriction in the region. Family history was more prevalent in females (27.27%) when compared to males (4.87%).

Data for risk factor distribution among males and females (Figure 4) using odds ratio(OR) shows that in male, prevalence of history of tobacco consumption (3.03) and inactive lifestyle (1.54) was extremely higher compared to women who had higher prevalence for the history of hypertension (1.11) and diabetes (1.398) compared to their counterpart.

The pie chart (Figure 5) shows the risk factor distribution in patients, where most patients were exposed to more than 1 risk factors (24), only 1 risk factor (19), risk factors and co morbid conditions (16) and co morbid conditions only (04) with an exception of just one patient with no risk factor/co morbid conditions diagnosed with an ACS event.

The patients were interviewed for their diet, Vegetarians were slightly more 31(59.62) than non-vegetarians 21(40.38) (figure 6). The odds ratio for the non-vegetarians with STEMI vs. NSTEMI was 3.33. The OR for STEMI patient's with non-vegetarian diet to vegetarian diet was 1.25. Pathological association of diet with the effect (STEMI, NSTEMI) needs to be explored further to support the findings.

Patients were divided into 3 groups (figure 7), STEMI (28), NSTEMI (16) and UA (8). The graph (figure 8) shows that the tobacco consumption was most prevalent in all the 3 groups of patients, followed by history of hypertension, physical Inactivity and alcohol consumption. The prevalence of the effect was categorically analyzed using the odds ratio. Most patients with an ACS event were diagnosed with STEMI. (STEMI (1.44) vs. NSTEMI and STEMI (3.5) vs. UA).The tobacco consumption in the patients with STEMI (1.77) vs. NSTEMI and STEMI (3.0) vs. UA can be due to the prevalence in this region, as most patient were exposed to it followed by the physical inactivity and hypertension in the patients with STEMI vs. NSTEMI, STEMI vs. UA, and NSTEMI vs. UA were 5.5, 7.33, 1.34 and 2.5, 10, 4 respectively.

According to the World Health Report 2002, cardiovascular diseases (CVD) will be the largest cause of death and disability in India by 2020.[34] It is expected that by 2020, CVD would prevail as the leading cause of death and disability over infectious diseases globally.[35] Cardiovascular diseases are the largest cause of mortality, accounting for around half of all deaths resulting from Non communicable diseases. Overall, CVDs accounted for around one-fourth of all deaths in India in 2008. CVDs are expected to be the fastest growing chronic illnesses between 2005 and 2015, growing at 9.2% annually, and accounting for the second largest number of non-communicable disease patients after mental illnesses.[36]

3.1 Age and Sex Distribution

The findings suggested that the prevalence of risk factors was heterogeneous in 41 male patients and 11 female patients. The male patients in this analysis constituted 79% of total population and the observation greatly coincides with the findings of Khaldoon A Al-Roomi *et al* (1994) which mentioned that the Risk of developing AMI was more in man compared to women.

According to Trivedi *et al* the incidence of coronary heart disease in male was 3 times more than female, comparable to 3.72 times observed in our study and is consistent with the report from multinational observational Global Registry of Acute Coronary Events (GRACE).[10]

3.2 Tobacco Consumption

There was a very high prevalence of Tobacco consumption at the baseline, with 27.27% of women and 82.92% men being exposed to a particular risk factor. In total, 71.15% of total study population was consuming tobacco. Cigarette smoking has also been reported to act synergistically with other known risk factors for CVD. According to Chhabra *et al*., smoking was defined as regularly smoking one cigarette or four beedies[46] daily or stoppage of smoking only within the past 12 months. There were 27 cases (51.92%) with smoking as risk factor in this study. The Interheart study also observed that smoking was a greater risk factor in younger population [22] Gaziano *et al* mentioned that "effects of alcohol consumption on cardiovascular disease are complex. Although heavy alcohol intake increases overall mortality and mortality due to cardiovascular diseases, moderate intake appears to exert a protective effect against coronary heart disease, as compared with drinking no alcohol".[37] which can be associated with this study, where 28.84% patients consumed alcohol and less than 3 drinks/wk (classified as light drinkers) by Enas *et al* [30]. Furthermore as per Gaziano *et al* it should lead atleast some protective effect against coronary heart disease compared to those with no drinking. However the protective effect was not seen for the reason that all of the patients in our study that had history of alcohol consumption were consuming tobacco products too. This was well explained by Thun MJ, that Alcohol consumption was associated with a small reduction in the overall risk of death in middle age (ages 35 to 69), whereas smoking approximately doubled this risk.[18]

According to Mehan *et al* there were 22.3% (27/121) cases that had smoking as risk factor in Baroda.[38] of which our study results suggested that tobacco consumption is 2.32 times more compared to the study by mehan *et al* with 71.15% study subjects.

This greatly reflects the observation so far that tobacco consumption is most prevalent risk factor in males compared to females, with proportion of around 7 times higher in Mehan *et al* compared to 11 times in our study. This observation can also be associated to 53.7% of total study subject being female in Mehan *et al* compared to 21% in our study.

3.3 Other Risk Factors

The overall prevalence of risk factors was comparatively low: 21.15% had diabetes, 34.61% had hypertension, and 5.76% had hyperlipidemia.

Increased occurrence of MI among low SES, accord with Gupta *et al* and the prevalence of CAD were inversely related to the level of education and income.[12] It is quite complimentary in this study because there were only 07 cases (13.46%) that had low socio economic status as risk factor, which suggested that the role of socioeconomic status needs to be further explored.

There has been a trend towards overweight and obesity in adolescence (with high levels of unhealthy eating and physical inactivity patterns) throughout the world. [39] According to Salim Yusuf *et al* "With increasing BMI values, the risk of myocardial infarction increased".[40] Furthermore by Mehan *et al* at Baroda, there were 37.7% patients who had overweight as risk factor[38] which was quite comparable with our study having 28% (overweight) and 3.84% (obese) patients.

The relative risk associated with greater body weight is higher among younger subjects. Darton-Hill *et al* (2004) observed that "More than 60% of overweight children have at least one additional risk factor for cardiovascular disease, such as raised blood pressure, hyperlipidemia, or hyperinsulinemia, and more than 20% have two or more risk factors"[41] quite comparative results with 70.58%, those who had at least raised blood pressure or hyperlipidemia and 29.41%, having two or more such risk factors. According to Rastogi *et al* association between increased sedentary activity and CHD risk, the equivalent of 3.6 hours per day of sedentary activities such as television viewing was associated with nearly a 90% increase in risk. [42]

The prospective analysis by Crowe *et al* involving 15,000 vegetarians and 30,000 non vegetarians with 1200 cases of IHD show that vegetarians in the United Kingdom have a 32% lower risk of developing IHD than do people who consume meat and/ or fish.[43]

Positive family history of premature CVD is a known genetic risk factor for incident CVD.[44] Prashanth *et al* had carried out a study with total of 1579 patients, where 121 patients were having Age ≤40 years of which the patients with a Family history of CAD were 1 9 (15%) compared to just 6% with patients Age >40 [31], which can be compared with our study where such prevalence was 9.61% in patients ≤45 years. Moreover the similar findings were reported by Yusuf stating that "Family history seemed to be slightly more important in young (PAR 14·8% [11·7—18·5]) compared with old individuals (10·4% [8·3-13·0]) [22] and supports the findings of our study.

Yusuf S *et al* 2004 observed in their study that hypertension and diabetes were associated with a greater odds ratio and PAR in women compared with men,[22] and this was seen in our study with the females having greater prevalence of diabetes (OR=1.4) and hypertension (OR=1.07) .

Among all the conventional risk factors, only 2 cases (3.84%) had obesity and stress. 3 cases (5.76%) had hypercholesterolemia which was significantly less common. The reason behind such finding might be the population structure that very few people are obese in comparison with the western region.

Saxena *et al* high risk cholesterol level was found in 7.5% population and its prevalence was almost equal amongst male and females. The numbers of patients in the age group 19-45 were 15 and constituted approximately 2.5% of the study population compared to 5.76% in our study which is approximately twice and they further discussed that their overall findings indicated that "prevalence of risk factors in their region of study was lesser in comparison to other areas of the country however the prevalence of risk factors was higher amongst females in comparison to males except for alcoholism and pre-hypertensive and hypertensive state".[45] which can be the prime reason that we had twice the prevalence compared to their findings.

According to Kumar *et al* sedentary lifestyle reduces both arterial compliances and insulin sensitivity predisposing individual to cardiovascular diseases. In their study 86% of the patients with ACS were physically inactive for the patients with SEM of age 61.8 ± 3.8 (48-69),[46] while in our study, the data confirms 34.61% patients were physically inactive. This difference might be due to the age group of patients enrolled in our study where SEM for age was 31.50 ± 1.55.

3.4 STEMI, NSTEMI or UA vs. risk factors

Hans-Richard Arntza *et al* "incidence of acute ST-elevation myocardial infarction (AMI) is decreasing in many European countries. however, the incidence of non-STEMI acute coronary syndrome (non-STEMI ACS) is increasing.[47]" Xavier D *et al* (2008), conducted a study with young participants than those in developed countries having a mean age 57 years whereas our study had an SEM of 31.50 ± 1.55 years, which is considerably younger group compared to their study. Their study concluded that "Patients in India who have acute coronary syndromes have a higher rate of STEMI than do patients in developed countries" [1], which was reflected in our study results with 53.84% (STEMI) participants against 30.76 % (NSTEMI). Furthermore in their study at presentation, slightly less than

a third of patients had diabetes mellitus and slightly more than a third had hypertension, which is comparable with the results from our study where 34% participants had a history of hypertension and 21% had diabetes.

According to Panduranga *et al* Older patients had higher frequencies of diabetes, hypertension, hyperlipidemia, prior angina, aspirin use, chronic obstructive pulmonary disease (COPD), renal impairment, and prior stroke, but less history of smoking, obesity, and family history of CAD, which were high among younger patients. (47%, 72%, and 16% respectively) [31] strongly supporting the results from our study where tobacco consumption is most prevalent. Moreover Xavier D concluded that "About two-fifths of all patients were either current or past smokers, with higher rates of current smoking in STEMI patients than patients with non-STEMI or unstable angina".

The patients are likely to develop STEMI (1.44) and the prevalence of tobacco consumption (1.77) compared to NSTEMI and 3.08 (STEMI vs. UA) in our study. These findings provide substantial evidence that tobacco consumption was most prevalent risk factor and STEMI was more prominent ACS event in this region.

Despite of some limitations inherent in this analysis, I believe that the approach to reach the prevalence rate which could be used for gross estimates has been fairly convincing. Although different population are believed to have different prevalence rates, the numerical data as assessed in this study can be used for assessment of the disease burden and risk comparison.

Table 1: Distribution by age of patient

	Total	18-25 yrs	26-30 yrs	31-35 yrs	36-40 yrs	41-45 yrs
Gender	52	4	5	7	14	22
Male	41	3	2	7	11	18
Female	11	1	3	0	3	4

Table 2 Patient- Risk factor distributions

Risk factors	Total no. of patients	Patient with specific risk factor	Percentage patient with specific risk factor (%)
Tobacco consumption		37	71.15
Obesity (BMI > 30 kg / m^2)		2	3.84
Diabetes		11	21.15
Family history		5	9.61
Alcohol consumption		15	28.84
Stress	52	2	3.84
Inactive life style		18	34.61
Poor socio economic class		7	13.46
Hypercholestrolemia		3	5.76
Hypertension		18	34.61

Table 3: Gender based life style risk factor distribution

Risk factors	No. of male patients N= 41	No. of female patients N= 11	% male patients	% female patients
Tobacco consumption	34	3	82.92	27.27
Obesity (BMI > 30 kg / m^2)	2	0	4.87	-
Diabetes	8	3	19.51	27.27
Family history	2	3	4.87	27.27
Alcohol consumption	15	0	36.58	-
Stress	1	1	2.43	9.09
Inactive life style	15	3	36.58	27.27
Poor socio economic class	5	2	12.19	18.18
Hypercholestrolemia	1	2	2.43	18.18
Hypertension	14	4	34.14	36.36

Figure 1: Age vs. number of patients

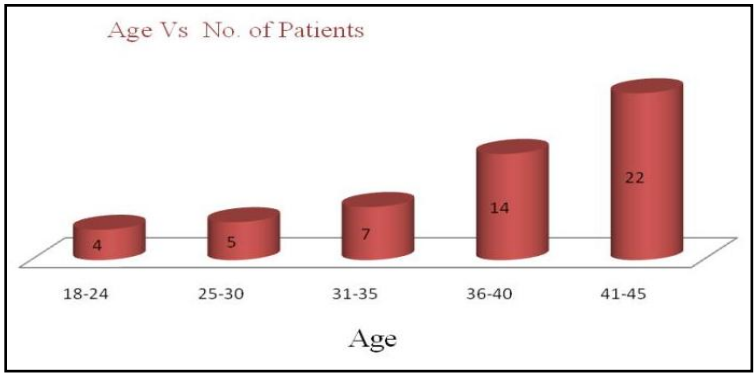


Figure 2: Mean age distribution

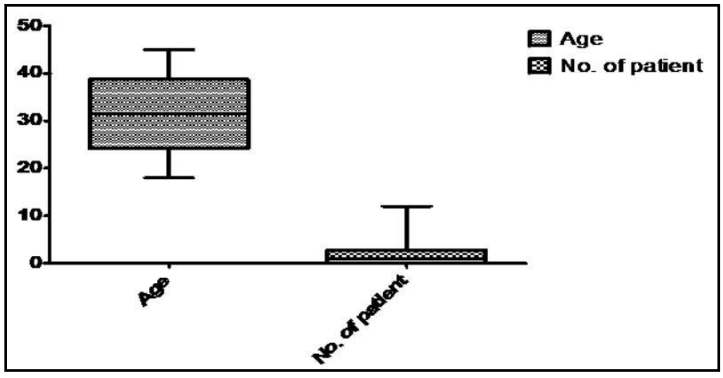


Figure 3: Gender distribution

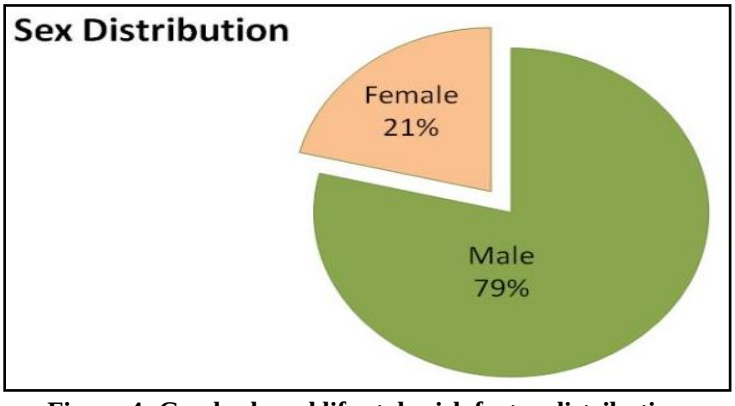


Figure 4: Gender based life style risk factor distribution

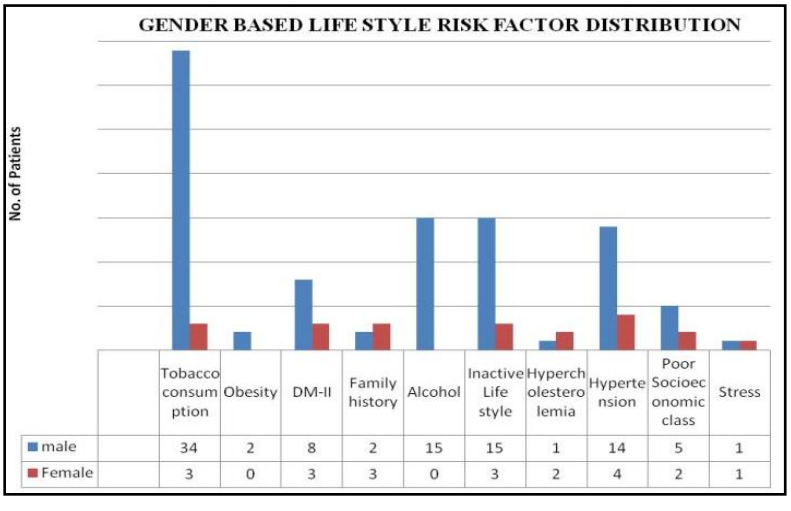


Figure 5: Total numbers of patients with risk factor/s and/or with/without co morbid conditions

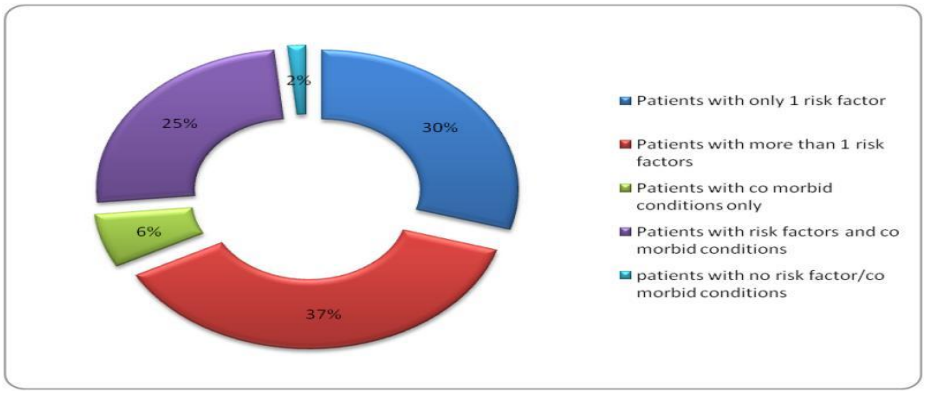


Figure 6: Numbers of vegetarians and non-vegetarians vs. ACS event (STEMI, NSTEMI, and UA)

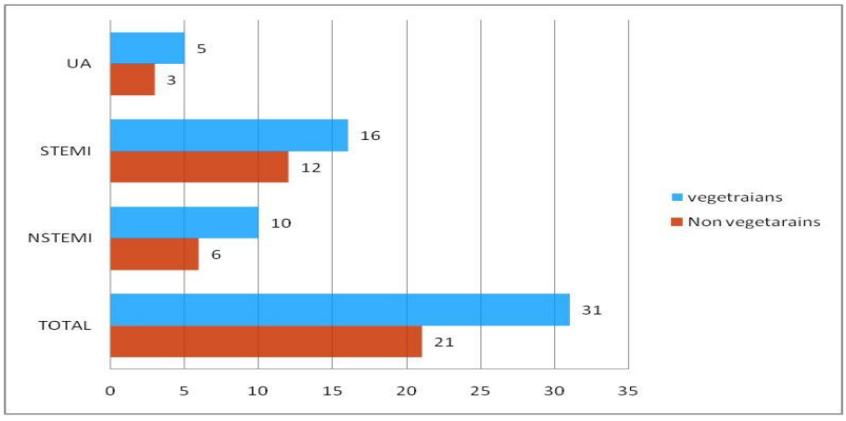


Figure 7: Numbers of Patients vs. Effect (STEMI, NSTEMI, and UA)

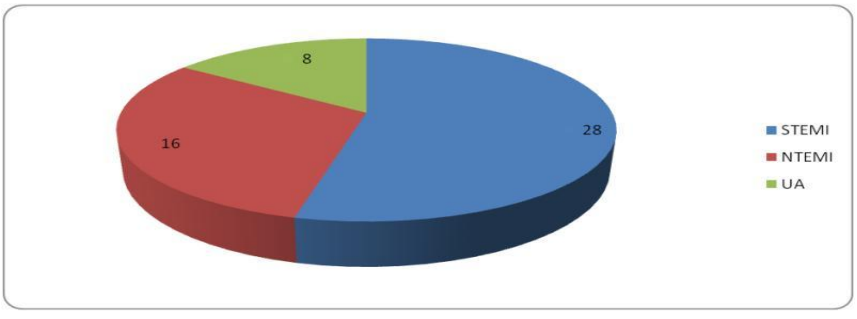
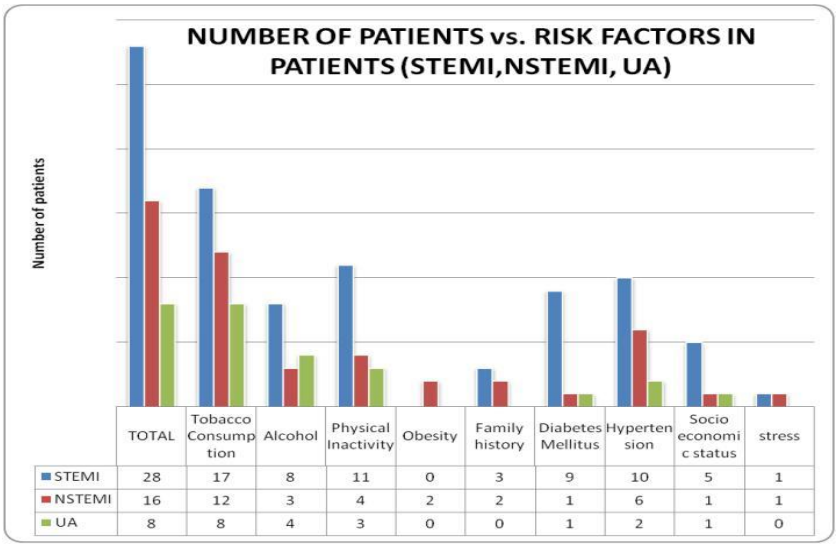


Figure 8: Numbers of patients vs. Risk factors in patients (STEMI, NSTEMI, and UA)



	TOTAL	Tobacco Consumption	Alcohol	Physical Inactivity	Obesity	Family history	Diabetes Mellitus	Hypertension	Socio economic status	stress
STEMI	28	17	8	11	0	3	9	10	5	1
NSTEMI	16	12	3	4	2	2	1	6	1	1
UA	8	8	4	3	0	0	1	2	1	0

4. Conclusion

The Risk factors forms the basis for the disease and therefore identifying the potential risk factors responsible for the ACS events at an early age bridges the gap between exposure and prevention. There is a need for prevention programs to control the prevalence of risk factors affecting the young productive population in India. Preventive strategies should begin in young population because of the much more frequent premature occurrence and malignant nature of CVD. The problem is increasing everyday due to total mismanagement of the tobacco-free life style in individuals. This study was conducted with an aim of identifying the prevalence of various risk factors and its effect on young productive workforce of the country. Patients with acute coronary syndrome has higher rate of STEMI than do patients in developed countries. The primary focus should be assessment of the CVD burden in the Indian subcontinent and development of policies to reduce the risk factor prevalence in the youth. It is understood that no one can see the future mishaps but surely can make efforts to reduce it and there can be no better way than educating the generation about these unhealthy life style implications on an individual and country as a whole.

4.1 Impact of findings on practice statements

These findings are resulting largely from the heterogeneous adoption of lifestyles conducive to increased cardiavascular risk-factors prevalence in developing countries, and they point to the urgent need for targeted patient education, awareness programs and public health interventions.

Timely recognition of CV risk factors and intervention to reduce these risk factors is of absolute importance to prevent and reduce ACS burden on society. This study aimed to compare the prevalence of major CV risk factors in acute coronary syndrome (ACS) patients and to determine their association with the events of ACS.

This sample is not a true representation of the community burden as only cases admitted to the hospital were included. Therefore, large-scale studies covering more geographical areas will be necessary to investigate the risk factors of a particular area and the required preventive measures needed to reduce the prevalence of ACS.

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Conflicts of interest:

The authors declare that there are no conflicts of interest.

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