

Original Research Article

**Risk factors in Young Patients (<40 Years) with Acute Coronary Syndrome and their Comparison with Patients of Older Age Group (>55 Years)****Dr. Swati Singh<sup>1</sup>, Prof. Mohammad Shoaib Zaheer<sup>2</sup>, Prof. M.U. Rabbani<sup>3</sup>, Dr. Khushboo Juneja<sup>4</sup>, Dr. Abhishek Singh<sup>5</sup>**<sup>1</sup>Senior Resident, Department of Cardiology, AIIMS Rishikesh<sup>2</sup>Professor, Department of Medicine, J.N.M.C.H, AMU, Aligarh<sup>3</sup>Professor, Department of Cardiology, J.N.M.C.H, AMU, Aligarh<sup>4</sup>Assistant Professor, Department of Community Medicine, SMS&R, Sharda University, Greater Noida<sup>5</sup>Assistant Professor, Department of Community Medicine, SHKM Govt. Medical College, Nalhar, Haryana**\*Corresponding author**

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**Abstract:** India is not only the high burden of cardiovascular diseases (CVDs), but also the effects of these diseases on the productive workforce aged 35–65 years. An observational, cross sectional study-comprising patients of acute myocardial infarction admitted in Intensive Coronary Care Unit of JNMCH, AMU Aligarh was conducted to study socio-demographic factors and risk factors associated with two age groups. Hypertension and smoking was found to be significant risk factor associated with patients of acute coronary syndrome of less than 40 years. In patients in younger age group, 61.5% were smokers, 36.5% were hypertensive, 21.1% were obese and 17.3% had DM. Dyslipidemia was present in 15.4% of patients, with past history of CAD in 32.7% & family history of CAD in 13.5%. In elderly age group, 65.4% were hypertensive, 13.7% had obesity, DM & smoking were present in 28.8% each & 17.3% had dyslipidemia. Past history of CAD is present in 25% & family history in 15.4% patients. Young ACS is a social as well as economic burden on the society. As the incidence of Young CAD is rising particularly in Indian subcontinent, genetic makeup of this population has been implicated apart from conventional risk factors.**Keywords:** Acute Coronary Syndrome, Risk factors, Young Patients, Old Patients

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**INTRODUCTION**

Premature coronary artery disease (CAD) is defined as cardiac events occurring before the age of 55 in men and 65 in women. In its severe form it is defined as CAD occurring below the age of 40 years [1]. The prevalence of CAD is two times higher in urban than in rural India [3, 4]. South Indians have higher prevalence as compared with their north Indian counterpart [2].

Acute coronary syndrome (ACS) among young adults is relatively low when compared with older population. The prevalence of young patients of less than 40 to 45 years of age among ACS patients is variable depending on the population studied and generally ranges from less than 2 to 10% [3]. It has been observed that there is high prevalence of current smoking, hyperlipidemia, obesity, and family history of coronary artery disease (CAD) among young ACS

patients and the clinical outcome in this group of ACS patients is better than older population.

The vulnerability of urban Indians to CAD is possibly related to different nutritional, environmental, and life style factors. The body mass index (BMI) in urban Indians as compared to rural Indians is 24 kg/m<sup>2</sup> vs. 20 kg/m<sup>2</sup> in males and 25 kg/m<sup>2</sup> vs. 20 kg/m<sup>2</sup> in females [4]. Therefore this study was planned to analyze the socio-demographic of acute myocardial infarction in young north Indian subjects (<40 years) & compare it with their older counterparts (>55 years). An additional objective was to study the risk factors (especially type of lipid abnormality, smoking, emotional stress, family history, lifestyle, co morbidities).

**MATERIALS & METHODS**

This was an observational, cross sectional, analytical study comprising patients of acute myocardial infarction admitted in Intensive Coronary Care Unit of JNMCH. They will be divided in two age groups.

- Group I: All subjects of acute myocardial infarction with age <40years
- Group II: All subjects of acute myocardial infarction with age >55 years

#### Inclusion criteria

- The subjects fulfilling any of the following two criteria out of three will be included in study.
- Typical symptoms (Chest discomfort).
- Typical pattern of ECG - ST segment elevation of  $\geq 0.1\text{mV}$  in at least two consecutive leads (ST segment elevation at the J-point with cut-off points  $\geq 0.2\text{mV}$  in V1 through V3 and  $\geq 0.1\text{mV}$  in other leads) or abnormal Q waves ( $>40\text{ms}$ ) in least two contiguous leads or fresh left bundle branch block.
- Elevated enzyme levels (Serum CPK-MB & Troponin above upper limit of normal level).

#### Exclusion criteria

- Subjects of stable angina will be excluded from the study.

#### Study strategy

A detailed clinical examination was carried out. Investigations was carried out included urine analysis, complete hemogram, fasting and post meal blood sugar estimations, blood urea, sr. creatinine, sr. electrolytes, lipid profile, LFT, troponins, CPK-MB level, chest x-ray and 2-D echo and Doppler study done for Left Ventricular Ejection Fraction and complications of myocardial infarction. The following parameters were studied:

1. Detailed history of clinical presentation of the cases.
2. Smoking
3. Past and family history of Ischemic heart disease, diabetes, hypertension, cerebro-vascular diseases.
4. Obesity: The following parameters were used to compare Body Mass Index:  $>25(\text{kg}/\text{m}^2)$  was taken as overweight/obese.
5. Dyslipidemia: According to NCEP-ATP III guidelines, patients were considered to have dyslipidemia when
  - Total cholesterol  $> 200 \text{ mg}\%$ ,
  - HDL  $< 40 \text{ mg}\%$ ,

- LDL  $> 100 \text{ mg}\%$
  - Triglycerides  $> 130 \text{ mg}\%$ .
6. Diabetes mellitus: Known diabetics on treatment or newly detected DM satisfying WHO criteria:
    - Symptoms of diabetes mellitus with random blood glucose  $>200 \text{ mg}\%$
    - Fasting plasma glucose  $> 126 \text{ mg}\%$ ,
    - 2 hr plasma glucose  $> 200 \text{ mg}\%$
  7. Hypertension: Known hypertensive on treatment or newly detected hypertension according to JNC VIII criteria.

#### RESULTS

In this prospective study, 52 patients of <40 years of age (group 1), presenting with Acute coronary syndrome were studied to observe their Clinical, biochemical & echocardiographic profile & compared to similar parameters of 52 patients of >55 years of age (group 2). In young age most patients (92.3%) with ACS were in age group from 20-30 years with only 4 cases (7.7%) in 20-30 year age group. Mean age of presentation was  $34.5 \pm 2.7$  years. In older age maximum patients were in age group of 55-65 years (48.1%), 17.3% patients were in 65-75 years age group, 7.7% from 75-85 years & only 3.8% in >85 years age with mean age of presentation  $66.5 \pm 7.3$  years. youngest patient was 22 years old & eldest 95 years old ( $T = 29.1$ ;  $p < 0.01$ ).

In the present study in young age patients there were 86.5% males & 13.4% females with male: female 6.4:1. In elderly patients there were 65.3% males & 34.6% females with male: female 1.8:1. In young population, only 32.7% were from rural areas with 26.9% males & 5.7% females. Urban population comprised of 67.3% of young ACS patients with 59.6% males & 7.7% females. In elderly population this rural urban difference had almost equalized. There were 46.2% rural patients with 42.3% males & 3.8% females & 53.8% urban patients with 40.4% males & 13.5% females.

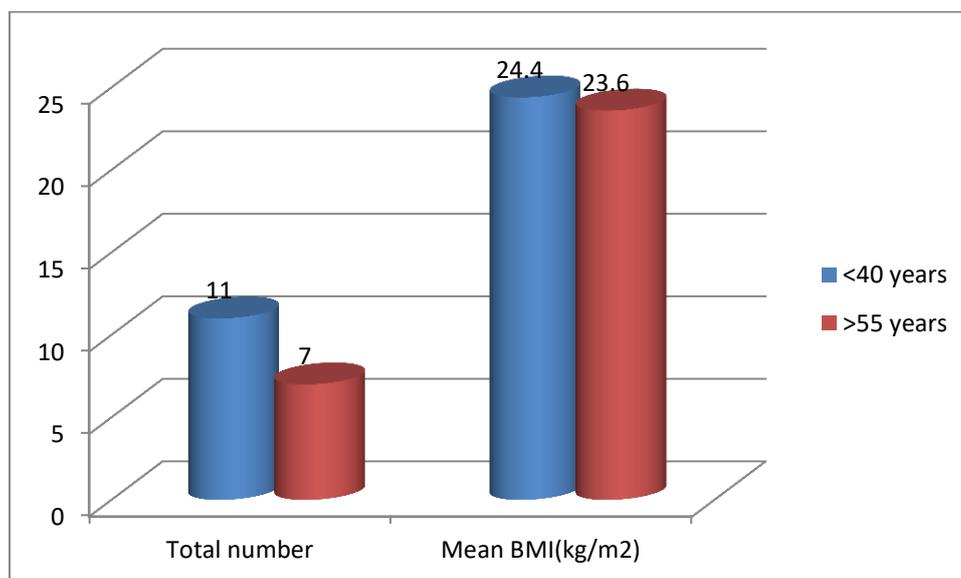
In patients in younger age group, 61.5% were smokers, 36.5% were hypertensive, 21.1% were obese and 17.3% had DM. Dyslipidemia was present in 15.4% of patients, with past history of CAD in 32.7% & family history of CAD in 13.5%. In elderly age group, 65.4% were hypertensive, 13.7% had obesity, DM & smoking were present in 28.8% each & 17.3% had dyslipidemia. Past history of CAD is present in 25% & family history in 15.4% patients.

Table-1: Risk Factors among study subjects

Risk Factors	<40 years	>55 years	P value
Diabetes Mellitus	9(17.3%)	15(28.8%)	NS
Hypertension	19 (36.5%)	34 (65.4%)	$\chi^2= 8.6$ ; $p<0.01$
Obesity	11(21.1%)	7 (13.7%)	NS
Smoking	32 (61.5%)	15 (28.8%)	$\chi^2= 11.2$ ; $p<0.01$
Dyslipidemia	8 (15.4%)	9 (17.3%)	NS
Family History	7 (13.5%)	8 (15.4%)	NS
Past History	17(32.7%)	13 (25.0%)	NS

In younger age group, 21.1% patients had BMI >25kg/m<sup>2</sup>, while in older age it only 13.5% patients

were obese with mean BMI 24.4 & 23.6kg/m<sup>2</sup> respectively (  $p<0.001$ ).



## DISCUSSION

The mean age in group 1 (<40 years) is 37.6 ± 3.9 years & in group 2 (> 40 years) is 69.0 ± 8.3. Youngest patient was 22 years old & eldest 95 years old. It is consistent with earlier study done by Arnab Ghosh *et al.*; [5] for younger age group. However, mean age ranges from 35 to 39 years in various studies [6, 7]. In the present study in young age patients there were 86.5% males & 13.4% females with male female ratio 6.4:1. In the elderly patients there were 65.3% males & 34.6% females with male: female 1.8:1. It is in consistence with study by Prabir K das *et al.*; [8] where there were 85.7% males and 14.2% females with M:F 6.03:1 in younger age group and 68.4% males and 31.5% females with M:F 2.2:1 in older age group. Incidence of ACS increases in females with age probably due to hormonal factors. It is also consistent with S Dwivedi *et al.*; [7] and Dang A *et al.*; [9]. It must be emphasized however, that although the median age of presentation is higher in women, they are known to have poorer prognosis compared to men [10-15]. In young population, only 32.7% were from rural areas

with 26.9% males & 5.7% females. Urban population comprised of 67.3% of young ACS patients with 59.6% males & 7.7% females.

In elderly population this rural urban difference had almost equalized. There were 46.2% rural patients with 42.3% males & 3.8% females & 53.8% urban patients with 40.4% males & 13.5% females. Exact incidence of ACS in young and old patients in rural and urban India has not been well studied; various prevalence studies have shown that cardiovascular disease is the number one cause of mortality in both rural and urban India [12]. The disease is more prevalent in urban populations and there is a clear gradient in its prevalence from rural to semi-urban to urban populations. Although the disease has a low prevalence among the rural Indians, it is progressively increasing. Rural-urban comparison shows that while prevalence has increased two-fold in rural areas (2.06% in 1970s to 4.14% in 1990s), the prevalence in urban areas has increased nine-fold (1.04% in early 1960s to 9.45% in mid-1990's) [17].

In younger age group most common risk factor was smoking (61.5%) followed by hypertension (36.5%), DM (17.3%), obesity (21.1%) and dyslipidemia (15.4%). Past and family history of CAD almost equally distributed between both the groups. In elderly most common risk factor was hypertension followed by DM, smoking, dyslipidemia & obesity. Our study shows similar results as by Dwivedi S *et al.*; [7] wherein smoking was the most common risk factor in young patients (61.42%) followed by hypertension in 51.42%, obesity in 35.71%, Dyslipidemia in 15.4% patients. The results were similar in studies done by Prabir K Das *et al.*; [8].

In our study 21.1% younger and 13.5% elderly patients had BMI >25 kg/m<sup>2</sup> with mean BMI being 24.4 ± 2.27 kg/m<sup>2</sup> and 23.6 ± 3.8kg/m<sup>2</sup> respectively. The prevalence of obesity in earlier series has been varying from 13.8-35.7%. Such a wide variation in incidence of obesity among various studies is due to different criterion defining obesity [7, 18]. This is in accordance of the general observation that Asians have lower BMI but higher rates of central obesity “The fat thin phenotype” [19].

## CONCLUSIONS

This study provides us with some insight into the incidence and risk factors associated with acute coronary syndromes, their presentation, therapeutic implications and complications. Young ACS is a social as well as economic burden on the society. As the incidence of Young CAD is rising particularly in Indian subcontinent, genetic makeup of this population has been implicated apart from conventional risk factors.

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