http://jmscr.igmpublication.org/home/
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v9i11.38

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Original Research Article

Socio-Demographic Characteristics and Association of Risk Factors with Type of Acute Coronary Syndrome in Elderly Patients

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Abstract
Objective: *This prospective, observational study was aimed at reporting the demographics of acute coronary syndrome in elderly patients (≥ 75 years) at northern part of India. The type of presentation was also studied in relation to the various risk factors of CAD.*
Material and Methods: *It was a single centre, open label, prospective observational study conducted in the elderly patients (more than 75 years of age) of acute coronary syndrome. A total of 100 patients of either sex were included in the study. These patients were studied for their socio-demographic profiles and the distribution of various risk factors for coronary artery disease amongst them.*
Results: *The majority of patients were males (69%) and the average age of the patients enrolled was 80.03 ± 3.46 years. The majority of the patients were from the state of Punjab (40%), followed by the state of Himachal Pradesh (26%), Haryana (17%), and Chandigarh (16%) respectively. Socioeconomic area-wise, 38% of patients were from rural areas, 37% from the urban area and 25% were from the semi-urban area. 42% of the patients had no formal education. 35 % of patients had been educated up to the primary level, 16% up to secondary level and 7% of the patients had received education up to the tertiary level. In the case of smoking as a risk factor, there was a significant association of smoking with the diagnosis of STEMI as compared to that of NSTEMI or UA*
Conclusions: *Male patients constituted more than 2/3rd of study population. Higher incidence of ACS was observed in patients with lower education level, and in patients from urban/semiurban areas compared to rural areas. Smoking as a risk factor, was significantly associated with the diagnosis of STEMI as compared to NSTEMI or UA.*
Keywords: *Acute Coronary Syndrome, Elderly, Socio-demographic, Smoking.*

Introduction

Coronary artery disease is an important health problem globally, taking almost epidemiological proportions in both developed and developing nations and accounts for the major cause of mortality worldwide.[1] The recent trends in the incidence of acute myocardial infarction show an inclination towards adults with advanced age. The world has seen an increase in the life expectancy of the population, thus increasing the incidence and prevalence of CAD in older individuals.[2] Advancing age itself acts as a strong risk factor for coronary artery disease as well as it is independently associated with the adverse cardiovascular outcomes, and thus adversely affecting prognosis amongst the elderly patients of acute coronary syndromes.[3,4] India has seen a significant increase in the prevalence of CAD both in the urban and rural population specially during the last 3 decades. Socio-demographic factors such as socioeconomic status plays an important role and affects significantly the cardiovascular health. Thus in the present study we aimed to record the socio-demographic profile of the acute coronary syndrome in elderly patients (more than 75 years of age) in the northern part of India, because very limited studies are there in this patient population.

Methodology

It was a single centre, observational prospective study in the patients of the acute coronary syndrome with age more than 75 years and undergoing routine coronary angiography/ percutaneous coronary intervention. The patients were diagnosed as unstable angina (UA), non-ST elevation myocardial infarction (NSTEMI), and ST-elevation myocardial infarction (STEMI), in accordance with American College of Cardiology/American Heart Association (ACC/AHA) definitions and were treated as per ACC/AHA recommendations.[5,6] A total of 100 consecutive patients of either sex were included in the study. These patients were studied for their demographic and angiographic profiles and the distribution of various risk factors for coronary artery disease amongst them. For the sake of simplified & detailed description, here we will focus on the socio-demographic profiles and association of the various risk factors with the type of ACS in this patient population.

Study inclusion criteria: Elderly patients of both sexes (age more than 75 years) presenting with ACS (UA/NSTEMI/STEMI) and undergoing coronary angiography/percutaneous coronary intervention, were included in the study.

Study exclusion criteria**:** Patients not giving informed consent, Age less than 75 years, Prior ACS/AMI, Chronic stable angina, congenital heart disease, valvular heart disease and hypertrophic cardiomyopathy. Patients having infections, severe renal impairment (creatinine clearance <30 ml/min) and chronic inflammatory disorders were also excluded.

Ethical Considerations

Written and well informed consent was taken from all patients. The study was cleared by the Institution ethical committee.

Statistical analysis

Patient characteristics and outcome measures data were presented using numbers and percentages for categorical variables and Mean (±SD) for quantitative variables. Comparisons between 3 or more groups were conducted using ANOVA followed by post-hoc tests, Kruskal-Wallis followed by Mann Whitney tests. P-values of <0.05 were taken to be statistically significant

Results

Distribution of patients

The study population consisted of a sample of 100 patients. The majority of patients were males (69%) and the average age of the patients enrolled was 80.03 ± 3.46 (mean ± SD) years. (**Table 1, Fig. 1**)

Table 1: Distribution of patients (data in percentage or mean ± SD)

	Frequency (n)/ or mean	Percentage/ or mean ± SD
Male	69	69%
Female	31	31%
Age (years)	80.03	80.03 ± 3.46

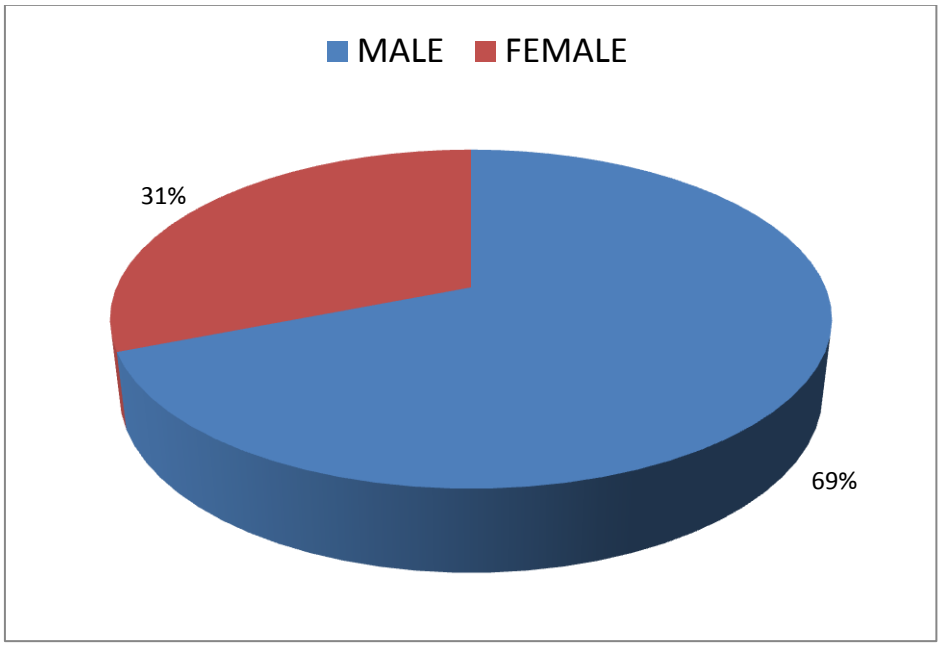

Fig.1: Distribution of patients

The majority of the patients were from the state of Punjab (40%), followed by the state of Himachal Pradesh (26%), Haryana (17%), and Chandigarh (16%) respectively. One patient was from the state of Jammu & Kashmir (**Fig. 2**). Socioeconomic area-wise, 38% of patients were from rural areas, 37% from the urban area and 25% were from the semi-urban area.

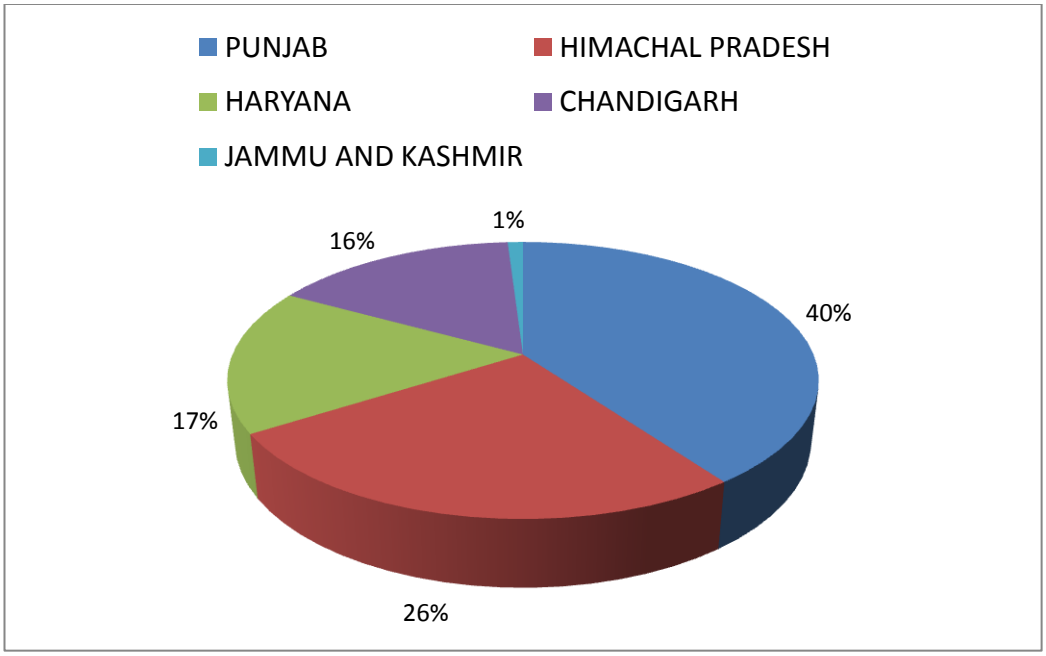

Fig.2: Demography of patients

42% of the patients had no formal education. 35 % of patients were educated up to the primary level, 16% up to secondary level and 7% of the patients had received education up to the tertiary level. Majority of the female patients (93%) were housewives and looked for the care of their home and family during their working days. One of the women (3.22%) was retired from govt. job and another one was in farming (3.22%). In male patients, 30.4% (21/69) were having farming as their primary occupation during their working life, and the same percentage of male patients (30.4%) were retired government employees. Another one-third of male patients i.e. 30.4% (21/69) were in small businesses during their working days. In remaining (8.69%) of males, other occupations like barber, laborer, electrician, rajmistri, carpenting, and private job, were present. All the enrolled patients (100%) were married.

Type of ACS and risk factor profile

The patients of ACS presenting as STEMI, NSTEMI, and UA, were compared for the distribution and their association with the various risk factors. There were 53 patients of STEMI, 25 of NSTEMI and 22 patients of UA (**Table 2**)

Table 2: Type of ACS and risk factor profile

Variables	STEMI (n=53)	NSTEMI (n=25)	UA (n=22)	p-value
Male	39	14	16	.267
Female	14	11	6	
Diabetes Mellitus	7	9	6	.061
Smoking	21	2	7	.017
Hypertension	31	14	16	.433
Family History of IHD	6	3	0	.247
Dyslipidemia	4	3	2	.814
Alcohol	11	3	7	.250
Previous Aspirin Use	3	0	2	.343
Atrial Fibrillation	3	1	0	.523
CKD	4	2	0	.405
Prior PCI	3	0	2	.343
BMI(Overweight/Obese)	23	10	13	0.363

In the majority of the risk factors there was found, no significant association with the three types of ACS, STEMI, NSTEMI, or UA. In case of smoking as a risk factor, there was a significant association of smoking with the diagnosis of STEMI as compared to that of NSTEMI or UA. 21 patients of STEMI had associated smoking as a risk factor compared to 2 cases in NSTEMI and 7 cases in UA, with a significant p-value of 0.017 (significant $p < 0.05$).

Discussion

The present study is an observational prospective study in the elderly patients (more than 75 years of age) with ACS, carried out at a tertiary care centre in northern India. Male patients were the major part of study population constituting more than 2/3rd of the study population. Predominantly male population having higher incidence of ACS compared to female counterparts have also been observed in other studies in asian population.[7,8] Duan JG et al, in their long term prospective cohort study with 2105 subjects and a median follow up period of 14.53 years, observed that male patients had a higher prevalence of ACS which was maintained across different age groups and through different follow up periods.[8] The gender difference in the psychosocial and behavioral coronary risk factors like smoking, excessive alcohol consumption in males may lead to increased prevalence CAD in them compared to female counterparts.[9]

The majority of the patients were from the state of Punjab (40%), followed by the state of Himachal Pradesh (26%), Haryana (17%), and Chandigarh (16%) respectively. The state of Punjab is in the

proximity of the institute and the prevalence of ischemic heart disease in Punjab is among the highest in India, along with the other states of Tamilnadu, Kerala, and Maharashtra.[10] Geldsetzer P et al, in their large cross sectional study across India with 797,540 subjects, demonstrated that the CVD risk was positively associated with the district level wealth quintile (median household wealth in a district) and urbanization of the population.[11] Also the household wealth quintile and the living in the urban area were positively correlated with the CVD risk in both men and women, although associations were observed to be more stronger in women.[11] In our study, the incidence of the CAD was higher in urban/semiurban areas compared to rural areas. A study by R B Singh et al[12] noted two or three time higher prevalence of CAD and risk factors of CAD among urban compared to rural subjects. This may be due to greater sedentary life style and alcohol consumption amongst the urban population. In the current study, only 23 % of patents were educated beyond the secondary level. The low socioeconomic status and lower education level is associated with a higher prevalence of coronary artery disease in India.[13-15] This is because of the inadequate management of risk factors and poor awareness of healthy life style amongst them. Socioeconomic status as measured by educational status have been observed to be inversely related to incidence of acute myocardial infarction in some case control studies.[16,17]

Further our study observed a significant association of smoking with STEMI rather than that of NSTEMI or UA. Smoking causes cardiovascular dysfunction by various mechanisms such as decreased synthesis of nitric oxide, inflammation in vasculature, lipid alteration with increased TG, LDL, and decreased in HDL.[18] Other mechanisms like oxidation of lipids, alterations in prothrombotic/antithrombotic and fibrinolytic factors, and platelet dysfunction have also been attributed for the atherosclerosis by smoking. The increased incidence of STEMI in smokers has also been observed in other studies.[19-21] STEMI was more commonly present in smokers than the never-smokers (69.8% versus 56.3%, p <0.001) while NSTEMI and UA were more commonly and significantly seen in never-smokers compared to smokers (36.6% versus 25.2% , p <0.001 in NSTEMI while 7.1% versus 4.9%, p = 0.02 in UA).[22]

Thus knowing about the various socio-demographic factors and their association with CAD especially in understudied population of elderly patients with ACS, would help in their better preventive and treatment measures.

Conclusions

Male patients constituted more than 2/3rd of study population. Higher incidence of ACS was observed in patients with lower education level, and in patients from urban/semiurban areas compared to rural areas. Smoking as a risk factor, was significantly associated with the diagnosis of STEMI as compared to NSTEMI or UA.

Abbreviations

ACS - Acute coronary Syndrome, CAD - Coronary Artery Disease, CVD – Cardiovascular Disease, IHD - Ischemic Heart Disease, UA - Unstable Angina ,NSTEMI - Non ST Elevation Myocardial Infarction, STEMI - ST Elevation Myocardial Infarction

Conflicts of Interest: None declared.

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