Print ISSN: 2321-6379
Online ISSN: 2321-595X

Original Article

Risk Factors and Clinical Outcomes of Acute Coronary Syndrome in Men: A Retrospective Study

Kala Jeethender Kumar[1], Shahood Ajaz Kakroo[2], O Sai Satish[3], M Jyotsna[4], B Srinivas[5], N Rama Kumari[5], K Satya Bharathi Lakshmi[1], Rajender Betham[2], Anil Kumar Enikapalli[2]

[1]Assistant Professor, Department of Cardiology, Nizams Institute of Medical Sciences, Hyderabad, Telangana, India, [2]DM, Department of Cardiology, Nizams Institute of Medical Sciences, Hyderabad, Telangana, India, [3]HOD and Professor, Department of Cardiology, Nizams Institute of Medical Sciences, Hyderabad, Telangana, India, [4]Professor, Department of Cardiology, Nizams Institute of Medical Sciences, Hyderabad, Telangana, India, [5]Additional Professor, Department of Cardiology, Nizams Institute of Medical Sciences, Hyderabad, Telangana, India

Abstract

Introduction: As the single largest cause of death on the planet, a cardiovascular disease including acute coronary syndrome (ACS) in all its forms is a vital, and more than that a matter of life or death. Despite the fact that the prevalence of ACS is higher in men; researches, up to now, have tended to focus more on the clinical outcomes of ACS in women rather than men.

Purpose: The present study aims to determine the risk factors and clinical outcomes of ACS in men, attended the tertiary health care center of Northwestern India.

Materials and Methods: In total, 500 male patients with age ≥18 years, who had the first-time presentation of ACS were included in this retrospective, observational study. A retrospective chart review was done, and demographic details, risk factors, coronary angiographic findings, and left ventricular ejection fraction were recorded.

Results: A total of 500 patients were involved in this study. Average age of the study population was found to be 53.4 ± 11.5 years. In men, diabetes (26.8%), followed by hypertension (24.2%), smoking (16.2%), and alcoholics (14.2%), was the most frequent factors associated with the development of ACS. In our study population, the majority of the patients (74.8%) had a single vessel disease and, the most commonly (77.8%) involved culprit vessel was left anterior descending artery. The maximum number of patients (80.2%) had achieved a good LV function at time of discharge.

Conclusion: Regardless of any gender bias, the prevalence of ACS has been continuously rising globally. Scrutinizing proper information with respect to risk factors and clinical presentation, ultimately aids in the management of therapy.

Key words: Acute coronary syndrome, Coronary angiogram, Coronary artery disease, Men, Risk factor

INTRODUCTION

Cardiovascular diseases (CVD) are major causes of mortality and morbidity worldwide, and these diseases have increased at an impressively fast rate in low- and middle-income countries. According to World Health Organization, an estimated 17.9 million people died due to CVD in 2016, represents 31% of all global deaths.[1] Acute coronary syndrome (ACS), a subset of CVD, refers to broad ranges of clinical condition include unstable angina, non-ST-segment elevation myocardial infarction (NSTEMI), and STEMI. The prevalence of ACS is predominant in men regardless of age specific groups.[2] In the last few years, there has been a growing interest in exploring the impact of gender difference in prognosis of ACS. This prognosis is a quite distinct among men and women mainly due to differences in baseline characteristics as well as physiopathological conditions; consequently, the diagnosis and management of ACS are also somehow distinct based on gender. In this context, Ayanian and Epstein[3] hold the view that men with ACS are more likely to undergo coronary angiography and invasive revascularization. In men, the risk factors associated with ACS are: Aging, high blood pressure, high blood cholesterol, smoking, lack of

Access this article online

www.ijss-sn.com

Month of Submission : 08-2020
Month of Peer Review : 09-2020
Month of Acceptance : 09-2020
Month of Publishing : 10-2020

Corresponding Author: Dr. Shahood Ajaz Kakroo, Department of Cardiology, Nizams Institute of Medical Sciences, Hyderabad - 500 082, Telangana, India.

physical activity, unhealthy diet, obesity or overweight, type-2 diabetes, and family history of coronary artery disease.[4,5] A vast amount of literature focus on the clinical presentation of ACS in women, apart from this, only few studies compared the clinical presentation of ACS among men and women. There is, yet, a lack of evidence based data deals with clinical outcomes of ACS in men. Toward this end, we conducted this study to shed light on the risk factors and clinical outcomes of ACS in men.

MATERIALS AND METHODS

Study Design and Patient Population

This was a retrospective, observational study conducted at a tertiary-care center of the Northwestern India between August 2016 and December 2019. Men with age ≥18 years, who had first-time presentation of ACS were a main inclusion criteria for this study. Patients with known coronary artery disease (CAD), previous revascularization percutaneous transluminal coronary angioplasty, and coronary artery bypass graft, left main coronary artery (LMCA) disease, and men with prior ischemic heart disease/prior heart failure were completely rejected from the study. Informed consent was obtained from all patients.

Data Collection

Data regarding baseline demographic details, risk factors, and coronary angiographic findings were collected from the patient medical records. At discharge time, left ventricular ejection fraction was also noted. A selective coronary angiogram was done using standard technique within 48 h of admission unless the patient was not willing for a coronary angiography or has significant renal illness.

Definitions

In this study, hypertension is defined as systolic blood pressure ≥140, and/or diastolic blood pressure ≥90 mmHg. Dyslipidemia is defined as the presence of total cholesterol >240 mg/dl, triglycerides >150 mg/dl, low-density lipoprotein >130 mg/dl, and high-density lipoprotein <40 mg/dl for males. Diabetes is defined as the plasma glucose concentration ≥200 mg/dl or fasting blood sugar ≥126 mg/dl. Significant CAD is defined as a diameter stenosis >70% in each major epicardial artery. Normal coronary vessels are defined as the complete absence of any disease in the LMCA, left anterior descending (LAD), left circumflex (LCX), and right coronary artery (RCA) as well as in their main branches.

Statistical Analysis

The analysis was performed using Statistical Package for the Social Sciences (SPSS version 15; Chicago, Illinois, USA) software. Continuous variables were expressed as mean and standard deviation, and categorical variables were expressed as frequency and percentage.

RESULTS

A total of 500 patients were included in the study. Table 1 demonstrates the baseline characteristics of men with ACS. The mean age of men with ACS was found to be 53.4 ± 11.5 years. In men, diabetes (26.8%) was the most common risk factor associated with the occurrence of ACS, followed by hypertension (24.2%), smoking (16.2%), and alcoholics (14.2%). Chest pain (90%) was the most common symptoms present in men with ACS, followed by sweating (84.4%) shortness of breath (65%). Angiographic characteristics of the study population are displayed in Table 2. With regard to coronary angiographic findings, most of the patients (74.8%) had single vessel disease, followed by double vessel disease (19.6%) and triple vessel

Table 1: Baseline characteristics of men with acute coronary syndrome

Variables	Patients (*n*=500)
Age (mean±SD, years)	53.4±11.5
Risk factors	
Diabetes mellitus, *n* (%)	134 (26.8)
Hypertension, *n* (%)	121 (24.2)
Dyslipidemia, *n* (%)	62 (12.4)
Tobacco chewing, *n* (%)	22 (4.4)
Smoking, *n* (%)	81 (16.2)
Alcoholic, *n* (%)	71 (14.2)
Family history of CAD, *n* (%)	9 (1.8)
Symptoms	
Chest pain, *n* (%)	450 (90)
Shortness of breath, *n* (%)	325 (65)
Dyspnea, *n* (%)	255 (51)
Sweating, *n* (%)	422 (84.4)
Palpitations, *n* (%)	107 (21.4)
Syncope, *n* (%)	94 (18.8)
Vomiting, *n* (%)	57 (11.4)
Nausea, *n* (%)	82 (16.4)

†SD: Standard deviation, CAD: Coronary artery disease

Table 2: Angiographic characteristics of our study population

Variables	Patients (*n*=500)
Diseased vessels	
Single vessel disease, *n* (%)	374 (74.8)
Double vessel disease, *n* (%)	98 (19.6)
Triple vessel disease, *n* (%)	28 (5.6)
Target coronary artery lesions (*n*=735)	
Left anterior descending, *n* (%)	389 (77.8)
Left circumflex, *n* (%)	215 (29.2)
Right coronary artery, *n* (%)	131 (17.8)
LV function at discharge	
Good LV Function, *n* (%)	401 (80.2)
Mild LV Function, *n* (%)	58 (11.6)
Moderate LV Function, *n* (%)	41 (8.2)

†LV: Left ventricular

disease (5.6%). LAD is the most commonly involved culprit vessels, representing in 389 patients (77.8%), followed by LCA in 215 patients (29.2%) and RCA in 131 patients (17.8%). 2D echocardiography showed that the higher number of patients (401 patients; 80.2%) had a good LV function, and mild LV dysfunction was observed in 58 patients (11.6%), and moderate LV dysfunction in 41 patients (8.2%), but none of the patients had severe LV dysfunction at time of discharge.

DISCUSSION

Given the fact that the pattern of ACS in men has been remained unclear, and further there is no such evidence based report that compile the comprehensive details particularly in men, motivated us to conduct this study.

In this study, the mean estimated age of ACS onset was 53.4 ± 11.5 years. This findings have been in good agreement with the previously reported studies by Duan *et al.*[2] and Chen *et al.*,[6] the reported mean age was 54.61 ± 11.24 years and 59 ± 12 years, respectively. In contrast to our findings, Assiri[7] reported higher age of ACS onset in men compared to our findings, and it was 60 ±13.4 years. Furthermore, Udell *et al.*[8] (61.65 years) and Arslanian-Engoren *et al.*[9] independently reported the marked higher mean age for the development of ACS in men. More toward this side, EPIHeart cohort study included a total of 873 patients, of which 646 were men with mean age of 62.2 ± 12.7 years.[10] Altogether, overall we can say that men are more likely to develop ACS over the 5th decades of life. In brief, the prevalence of ACS has been growing with advanced age.

Regarding coronary risk factors, in this study, diabetes mellitus, hypertension, and smoking were the most common risk factors for the progression of ACS in men. The findings reported by Assiri[7] corroborate with our results. In one study, diabetes mellitus (35.6%) was the most common risk factor for ACS in men, and hyperlipidemia (60.4%) been a second common risk factor, and then hypertension (79.6%) got rank.[8] Controversially, another study reported smoking (69%) as the most common risk factor for ACS in men, followed by hypertension (62%) and dyslipidemia (62%).[9] It has been reported that hypercholesterolemia (88%), hypertension (53%), and smoking (71%) have contributed in the progression of ACS.[6] In his seminal article on sex differences in ACS, Khan *et al.*[11] reported that the majority of patients had hypertension as the first common risk factor, smoking was second one, and BMI >30 was third one; nevertheless, the younger men were involved in this study with mean age 49.0 years and ranged from 45 to 53 years.

The presence of diabetes worsens prognosis of ACS in both men and women, however, men is affected with lesser extent than women. For example, the relative risk of myocardial infarction (MI) is 3 times less in diabetic man compared to diabetic women (50% vs. 150%).[12] In men, another well-established leading risk factor of ACS is hypertension. It has been reported that hypertension has been noted in men younger than 65 years compared to women with similar age group.[13]

Smoking is regarded as a strong risk factor for all CVD including ACS. It contributes in premature atherosclerosis and cardiac death. Due to modern civilization, the number of smokers has been expected to be higher in recent decades than the previous time. Moreover, men more likely have a habit of smoking than women. To illustrate, the proportion of smokers in developed countries has been 35%, and it was 50% in developing countries. On the other hand, there has been a reversed pattern in women; around 22% women have been smokers in developed countries and 9% in developing countries.[14] To sum up, the earlier mentioned and other previously reported studies claimed diabetes, hypertension, and smoking as major risk factors for the progression of ACS, nonetheless, their predominance were distinct in these reports.[11,15,16]

Since the early 2000s, a shred of evidence has established a link between the presentation of symptom and gender differences. Experts have also agreed with that men with ACS have been less likely to present worsen symptoms than women. In women, nausea or vomiting, and pain between the shoulder blades, and shortness of breath have been reported as the typical presentation of ACS. On the other hand, men are more likely presented with chest pain (79% vs. 74%), shortness of breath (40% vs. 48%), diaphoresis (47% vs. 44%), nausea or vomiting (28% vs. 39%), and left arm and left shoulder pain (37% vs. 38%) than women.[17] Agreed with this findings, our study also demonstrated that chest pain was the most common complaint in men with ACS. In light of their findings, Assiri[7] reported the symptoms of chest pain in 71 percent of men. These findings are in line with earlier reported studies as well.[9,6,18]

On coronary angiography findings, most of the patients had single vessel disease, followed by double vessel disease (19.6%) and triple vessel disease (5.6%). One study reported single vessel disease in 31% and multi-vessels in 46.7% of men.[7] Another study reported that 49.3% patients had single vessel disease, 17.3% patients had double vessel disease, and 22.2% patients had triple vessel disease.[8] LAD was most commonly involved culprit vessel, followed by LCX and RCA among men in our study population. Regarding this context, there is a limited data available in the literature, especially for men

with ACS; however, results obtained from single study were in favor of our findings.[11] At time of discharge, almost patients recovered, and preserved improved left ventricular function. Fortunately, death was not reported in our subjects.

It is plausible that a number of limitations might have affected the results obtained. To begin with, the study was retrospective in nature, and comprised limited sample size, hence, confounding factors might have influenced the final outcomes. Another possible source of error is a hospital based study design; thus, the obtained outcomes might not be an actual representation of the entire population.

CONCLUSION

This study has provided a deeper insight into risk factors and clinical outcomes of ACS in men. As concluded, diabetes, hypertension, smoking, and alcoholics were the primary risk factors in men with ACS. The almost patients had a single-vessel disease, and LAD was the most common culprit vessel. The maximum number of patients recovered with good left ventricular function.

REFERENCES

1. World Health Organization. Cardiovascular Diseases; 2020. Available from: https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds). [Last accessed on 2020 Sep 22].
2. Duan JG, Chen XY, Wang L, Lau A, Wong A, Thomas GN, *et al*. Sex differences in epidemiology and risk factors of acute coronary syndrome in Chinese patients with Type 2 diabetes: A long-term prospective cohort study. PLoS One 2015;10:e0122031.
3. Ayanian JZ, Epstein AM. Differences in the use of procedures between women and men hospitalized for coronary heart disease. N Engl J Med 1991;325:221-5.
4. Mansour H, Reda A, Mena M, Ghaleb R, Elkersh A. Pattern of risk factors and management strategies in patients with acute coronary syndrome, in different age groups and sex categories. Atheroscler Suppl 2017;25:e1-11.
5. Foussas S. Obesity and acute coronary syndromes. Hellenic J Cardiol 2016;57:63-5.
6. Chen W, Woods SL, Wilkie DJ, Puntillo KA. Gender differences in symptom experiences of patients with acute coronary syndromes. J Pain Symptom Manage 2005;30:553-62.
7. Assiri AS. Gender differences in clinical presentation and management of patients with acute coronary syndrome in Southwest of Saudi Arabia. J Saudi Heart Assoc 2011;23:135-41.
8. Udell JA, Koh M, Qiu F, Austin PC, Wijeysundera HC, Bagai A, *et al*. Outcomes of women and men with acute coronary syndrome treated with and without percutaneous coronary revascularization. J Am Heart Assoc 2017;6:e004319.
9. Arslanian-Engoren C, Patel A, Fang J, Kline-Rogers E, Duvernoy CS, Eagle KA, *et al*. Symptoms of men and women presenting with acute coronary syndromes. Am J Cardiol 2006;98:1177-81.
10. Araújo C, Laszczyńska O, Viana M, Melão F, Henriques A, Borges A, *et al*. Sex differences in presenting symptoms of acute coronary syndrome: The EPI Heart cohort study. BMJ Open 2018;8:e018798.
11. Khan NA, Daskalopoulou SS, Karp I, Eisenberg MJ, Pelletier R, Tsadok MA, *et al*. Sex differences in acute coronary syndrome symptom presentation in young patients. JAMA Intern Med 2013;173:1863-71.
12. Peterson PN, Spertus JA, Magid DJ, Masoudi FA, Reid K, Hamman RF, *et al*. The impact of diabetes on one-year health status outcomes following acute coronary syndromes. BMC Cardiovasc Disord 2006;6:41.
13. Cutler JA, Sorlie PD, Wolz M, Thom T, Fields LE, Roccella EJ. Trends in hypertension prevalence, awareness, treatment, and control rates in United States adults between 1988-1994 and 1999-2004. Hypertension 2008;52:818-27.
14. Mackay J, Eriksen M. The Tobacco Atlas. Geneva: World Health Organization; 2002.
15. Babu AS, Haneef M, Joseph AN, Noone MS. Risk factors among patients with acute coronary syndrome in Rural Kerala. Indian J Community Med 2010;35:364-5.
16. Ralapanawa U, Kumarasiri PV, Jayawickreme KP, Kumarihamy P, Wijeratne Y, Ekanayake M, *et al*. Epidemiology and risk factors of patients with types of acute coronary syndrome presenting to a tertiary care hospital in Sri Lanka. BMC Cardiovasc Disord 2019;19:229.
17. van Oosterhout RE, de Boer AR, Maas AH, Rutten FH, Bots ML, Peters SA. Sex Differences in symptom presentation in acute coronary syndromes: A systematic review and meta-analysis. J Am Heart Assoc 2020;9:e014733.
18. Akinkuolie AO, Mora S. Are there sex differences in acute coronary syndrome presentation? A guide through the maze. JAMA Intern Med 2013;173:1861-2.

How to cite this article: Kumar KJ, Kakroo SA, Satish OS, Jyotsna M, Srinivas B, Kumari NR, Lakshmi KSB, Betham R, Enikapalli AK. Risk Factors and Clinical Outcomes of Acute Coronary Syndrome in Men: A Retrospective Study. Int J Sci Stud 2020;8(7):102-105.

Source of Support: Nil, **Conflicts of Interest:** None declared.