

# Clinical Profile and Conventional Risk Factors of Acute Coronary Syndrome in Late Elderly Patients

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## Abstract

**Background and Aims:** Acute coronary syndrome is an important health issue. There is paucity of its data in late elderly. We aimed to study their clinical profile and prevalence of conventional risk factors.

**Methods:** Descriptive cross-sectional study conducted at Shahid Gangalal National Heart Centre from February 2022 to May 2022 including 71 consecutive patients of acute coronary syndrome of age >75 years. They were evaluated focusing their chief complaints and cardiovascular risk factors.

**Results:** Mean age was 80.32±4.06 years. Forty (56.33%) were male and 31 (43.66%) were female. Thirty-nine (54.92%) were hypertensive, 29 (40.84%) were diabetic, 18 (25.35%) were smoker, 10 (14.08%) had history of dyslipidemia and 6 (8.45%) had family history of cardiovascular disease. Chest pain was present in 54 (76.05%), dyspnea in 28 (39.43%), sweating in 15 (21.12%) and nausea/vomiting in 8 (11.26%). Palpitation was present in 7 (9.85%), and epigastric pain in 13 (18.30%). Seven (9.85%) gave history of pre-syncope/ syncope and 6 (8.45%) had altered mental status. There was significant correlation of smoking (p=0.02) and types of ACS (p=0.001) with gender.

**Conclusion:** Acute coronary syndrome were plausibility common in late elderly female. Chest pain was commonest complaint in both genders. Dyspnea, sweating and epigastric pain were also common. Pre-syncope/ syncope and altered mental status were also present in some cases. Conventional risk factors were quite common in both genders. These symptoms can be features acute coronary syndrome in elderly hence should be evaluated cautiously.

**Keywords:** Acute coronary syndrome, Clinical features; Elderly, Risk factors.

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## Introduction

Acute coronary syndrome (ACS) is a significant health problem of elderly and majority of ACS related death occurs on them.<sup>1</sup> However, clinical trials have included substantially low number of elderly of ACS and they are often excluded.<sup>2,3</sup> So there is scarcity on evidences in ACS in elderly.<sup>4</sup>

Elderly ACS patients can have autonomic symptoms like dyspnea, sweating, pre-syncope or syncope, nausea and vomiting as presenting complaints, so they might be recognized late and can have poor outcomes.<sup>2,5</sup> Studies have shown increasing age also changes the overall characteristics of ACS. Women represented less than 30% of ACS in randomized controlled trials when mean age was 60 to 63 years, whereas it was 50% among the participants of mean age 80 years.<sup>6</sup> Conventional risk factors like diabetes (DM), hypertension (HTN), dyslipidemia, smoking have also been reported in significant in elderly.<sup>7</sup> Previous studies in different settings have emphasized that trials should make efforts to enroll the elderly ACS to define risk and benefit of treatment.<sup>8,9</sup>

Elderly constitutes an important part of every society and they deserve special care. There is lack of data on ACS of elderly in our part of world. The objective of this study was to study on clinical profile and prevalence of traditional risk factors of ACS in late elderly of age more than 75 years in our setting and compare them in relation to gender which will guide us for their better management in future.

## Methods

This was a descriptive cross-sectional study conducted at Department of Cardiology, Shahid Gangalal National Heart Centre (SGNHC), Bansbari Kathmandu Nepal from February 2022 to May 2022. The study was conducted after getting approval from institutional review board (IRB) of SGNHC. Informed consent was taken from all the participants. Consecutive patients of acute coronary syndrome with age > 75 years of age were included. Those who could not recall exact age, who didn't provide voluntary consent for participation, whose detail clinical information were not available were excluded. A total of 71 participants were enrolled in the study.

Participants were interviewed regarding presence of cardiovascular risk factors described previously in literatures including the established conventional risk factors.10 Their history of HTN, DM, smoking, dyslipidemia as four conventional risk factors and other probable risk factors like family history of cardiovascular disease (CVD) and dietary pattern (non-vegetarian or vegetarian) were taken in consideration. They were asked about their chief complaints and noted if there were chest pain, dyspnea, sweating, nausea/vomiting, palpitation, epigastric pain, pre-syncope/syncope and altered mental status or not. Their blood pressure (BP), height and weight were measured. Both groups of participants with history of hypertension or those having BP  $\geq 140/90$  mmHg confirmed by two readings taken 5 minutes apart were enrolled as hypertensive.

Diagnosis of ACS was confirmed and categorized into ST-segment elevation myocardial infarction (STEMI), Non-ST-segment elevation myocardial infarction (NSTEMI) and unstable angina (UA) as described in literature.11 History, electrocardiogram (ECG) and cardiac biomarkers that is troponin I and /or creatinine phosphokinase myocardial band (CPK-MB) were taken on consideration. They were categorized as STEMI for those who had 1 mm or more ST elevation in at least 2 anatomically contiguous ECG leads. However for leads V2-V3, ST elevation of at least 2 mm or more in male  $\geq 40$  years, 2.5 mm or more in male  $< 40$  years and 1.5 mm or more in female were considered STEMI. Those with positive cardiac biomarker (positive troponin I and /or more than 2 fold rise in CPK-MB) but no ST elevation were categorized as NSTEMI and those with negative biomarker and no ST elevation in ECG were categorized as UA.

Data entry and analysis were done in Statistical Package for the Social Sciences (SPSS) version 20 for windows. Frequency, percentage distribution and mean  $\pm$  standard deviation were calculated for variables to be tested. Multi linear regression analysis were done to see level of correlation between findings of male and female. R coefficient was calculated. P value were calculated and value  $< 0.05$  were considered statically significant.

**Results**

Age of participants ranged from 76 to 92 years and mean age was  $80.32 \pm 4.06$  years. A total of 40 (56.33%) were male and 31 (43.66%) were female which is shown in figure 1.

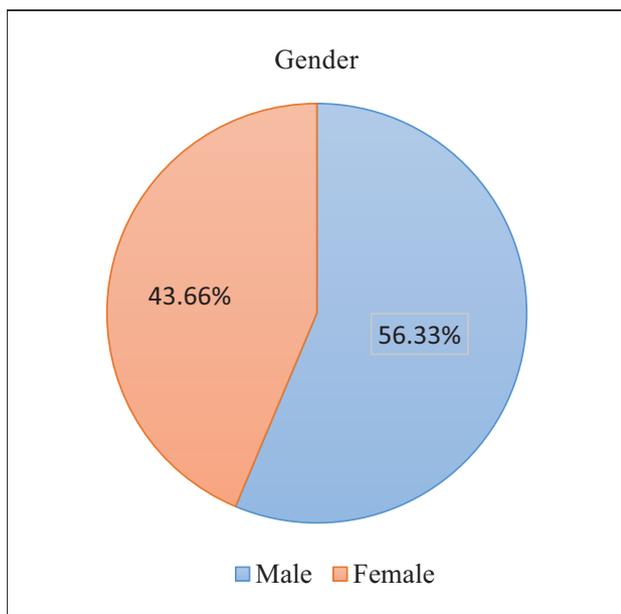


Figure 1: Gender of the participants.

A total of 39 (54.92%) were hypertensive, 29 (40.84%) were diabetic, 18 (25.35%) were smoker, 10 (14.08%) had history of dyslipidemia. Six (8.45%) had family history of CVD. Fifty-eight (81.69%) were non-vegetarian. The baseline characteristics of the participants including the prevalence of conventional risk factors is shown in table 1.

Table 1: Baseline characteristics of participants.

Characteristics	Frequency	Percentage
Hypertension	39	54.92%
Diabetes	29	40.84%
Smoking	18	25.35%
Dyslipidemia	10	14.08%
Family history of CVD	6	8.45%
Dietary pattern (Non-Veg.)	58	81.69%

Mean blood pressure and body mass index (BMI) of participants were  $141.25 \pm 23.48 / 84.82 \pm 16.05$  mmHg and  $25.27 \pm 3.44$  (range 19.8-34) kg/m<sup>2</sup> respectively.

Among the participants of ACS 36 (50.70%) were of STEMI, 16 (22.53%) were of NSTEMI and 19 (26.70%) were of UA which is shown in figure 2.

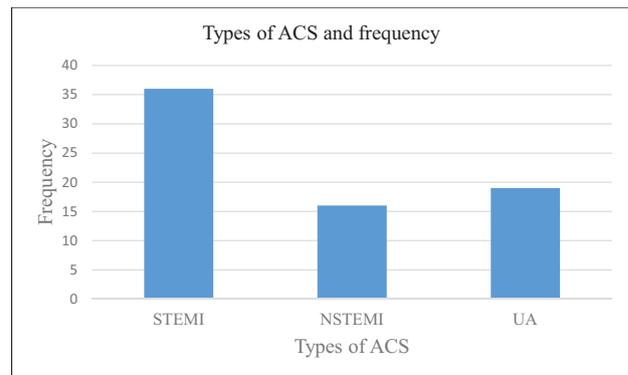


Figure 2: Types of Acute Coronary Syndrome.

Chest pain was present in 54 (76.05%) participants, dyspnea in 28 (39.43%), sweating in 15 (21.12%) and nausea/vomiting in 8 (11.26%). Similarly palpitation was present in 7 (9.85%), and epigastric pain in 13 (18.30%). A total of 7 (9.85%) gave history of pre-syncope/ syncope and 6 (8.45%) complained of altered mental status. The chief complaints of participants are shown in table 2.

Table 2: Chief complaints of participants.

Title	Frequency	Percentage
Chest pain	54	76.05%
Dyspnea	28	39.43%
Sweating	15	21.12%
Nausea/vomiting	8	11.26%
Palpitation	7	9.85%
Epigastric pain	13	18.30%
Pre-syncope / syncope	7	9.85%
Altered mental status	6	8.45%

Linear regression analysis revealed significant correlation of smoking and types of ACS with gender ( $R=0.60$ ). Other tested variables showed no significant correlation with gender. The analysis of tested variables and their P values are shown in table 3.

**Table 3:** Linear regression analysis report including P values of variables in relation to gender.

Variables	Male (40 No.)	Female (31 No.)	P value
Age (Mean±SD years)	79.32±3.25	81.61±4.65	0.089
Chest pain (No.)	29	25	0.107
Dyspnea (No.)	16	12	0.462
Sweating (No.)	10	5	0.621
Nausea/vomiting (No.)	5	3	0.089
Palpitation (No.)	4	3	0.199
Epigastric pain (No.)	9	4	0.878
Pre-syncope / syncope (No.)	5	2	0.399
Altered mental status (No.)	4	2	0.120
Hypertension (No.)	22	17	0.427
Diabetes (No.)	15	14	0.856
Smoking (No.)	14	4	0.020
Dyslipidemia (No.)	5	5	0.319
Family history of CVD (No.)	4	2	0.706
Non Veg. Diet (No.)	33	25	0.379
BMI (Mean±SD kg/m <sup>2</sup> )	24.72±3.13	25.98±3.74	0.059
Types of ACS (No.)			
STEMI	25	11	0.001
NSTEMI	9	7	
UA	6	13	

## Discussion

Mean age of participants of this study was 80.32±4.05 years and 56.33% were male. Chest pain was the most common presenting complaints of our participants and it was present in 76.05%. Dyspnea was present in 39.43%. Sweating and epigastric pain was present in 21.12% and 18.30% respectively. Pre-syncope / syncope was present in 9.85% and altered mental status was present in 8.45%. We found 54.92% hypertensive, 40.84% diabetic, 25.35% smoker, 14.08% dyslipidemic in our study.

In a study by Paudel et al. the total of 53.8% of participants of ACS of age more than 65 years were male and 46.2% were female.<sup>12</sup> The average age was 80 years in a study similarly to ours done on late elderly of age more than 75 years by Morici et al. and 60.5% of their participants were male, which was similar to our findings.<sup>7</sup>

Hypertension was present in 55%, DM in 30%, smoking in 20% and dyslipidemia in 35% of elderly MI of age  $\geq 75$  years in a study by Goch et al.<sup>13</sup> Hypertension was present in 71.6% of STEMI and 81% of Non ST elevation acute coronary syndrome

(NSTACS), DM was present in 25.4% of STEMI and 31.7% of NSTEMI and 10.6% of STEMI and 8% NSTEMI were smoker in a study by Morici et al.<sup>7</sup>

In a study by Su et al. chest pain was present in 59.6%, dyspnea in 40.4%, sweating in 17.5% epigastric pain in 14% and syncope in 3.5% in elderly patients of age 65 years and above.<sup>14</sup> Chest pain was present in 47.5% and dyspnea/fatigue in 45% of patients of MI of age  $\geq 75$  in a study by Goch et al.<sup>13</sup> A study by Leonardi et al. have stated that though atypical presentations of ACS are common in elderly, chest pain is the most frequent presenting symptoms which is in accordance with our findings.<sup>3</sup>

Linear regression analysis revealed significant correlation of smoking and type of ACS with gender. We didn't find any significant correlation of other tested variables in between the male and female genders of ACS in late elderly. Tai et al. also reported significant correlation of smoking and types of ACS (STEMI vs. NSTEMI) in between male and female in elderly patients of age  $\geq 75$  years. Men had higher prevalence of smoking and number of STEMI was more in male compared to female. They found DM significantly more common in female.<sup>15</sup> Dong et al. also showed excess risk of ACS associated with diabetes in women than in men.<sup>16</sup> Though, we did not find significant difference in DM in late elderly in relation to gender, authors have suggested further work on it.<sup>16</sup>

This study tried to address on an important health issue of ACS in late elderly in our setup. This study has several limitations to mention. It was a single center study with limited sample and limited study duration. We encourage larger studies including more variables.

## Conclusion

Nearly half of the participants of the present study were female, so ACS was plausibly common in late elderly female. Chest pain was the commonest complaints in elderly patients of ACS, but other symptoms like dyspnea, sweating, epigastric pain were also common. Few patients had pre-syncope / syncope and altered mental status as presenting complaints. Presence of these symptoms should raise the suspicion of ACS on elderly. Conventional risk factors of ACS were quite common. Gender showed positive correlation with type of ACS and smoking. This findings will help in recognizing and thus in managing elderly ACS more precisely in our context.

## Source of funding

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## Conflict of interest

None

## References

- Messerli A, Zida KM. Interventions in the elderly: special considerations. In: Camm AJ, Luscher TF, Maurer G, et al, editors. The ESC Textbook of Cardiovascular Medicine. Volume 2. 3rd ed. New Delhi: Oxford University Press; 2019. p. 2981-2983.
- Engberding N, Wenger NK. Acute Coronary Syndromes in the Elderly. F 1000 Research. 2017; 6:1791. <https://doi.org/10.12688/f1000research.11064.1>
- Leonardi S, Bueno H, Ahrens I, Hassager C, Bonnefoy E, Lettino M. Optimised care of elderly patients with acute coronary syndrome. European Heart Journal: Acute Cardiovascular Care. 2018; 7(3): 287-295. <https://doi.org/10.1177/2048872618761621>

4. Padilla IM, Marti'n-Asenjo R, Bueno H. Management of Acute Coronary Syndromes in Geriatric Patients. *Heart, Lung and Circulation*. 2017; 26: 107–113. <https://doi.org/10.1016/j.hlc.2016.07.008>
5. Dai X, Whitehead JB, Alexander KP. Acute coronary syndrome in the older adults. *Journal of Geriatric Cardiology*. 2016; 13: 101-108. <https://doi.org/10.11909/j.issn.1671-5411.2016.02.012>
6. Savonitto S, Morici N, De Servi S. Treatment of Acute Coronary Syndromes in the Elderly and in Patients With Comorbidities. *Rev Esp Cardiol*. 2014; 67(7):564-573. <https://doi.org/10.1016/j.recesp.2014.02.010>
7. Morici N, Savonitto S, Ferri LA, Grosseto D, Bossi I, Sganzerla P, et al. Outcomes of Elderly Patients with ST-Elevation or Non-ST-Elevation Acute Coronary Syndrome Undergoing Percutaneous Coronary Intervention. *The American Journal of Medicine*. 2019; 132: 209-216. <https://doi.org/10.1016/j.amjmed.2018.10.027>
8. Alexander KP, Newby LK, Armstrong PW, Cannon CP, Gibler WB, Rich MW, et al. Acute Coronary Care in the Elderly, Part II ST-Segment–Elevation Myocardial Infarction A Scientific Statement for Healthcare Professionals From the American Heart Association Council on Clinical Cardiology. *Circulation*. 2007; 115:2570- 2589. <https://doi.org/10.1161/CIRCULATIONAHA.107.182616>
9. Alexander KP, Newby LK, Cannon CP, Armstrong PW, Gibler WB, Rich MW, et al. Acute Coronary Care in the Elderly, Part I Non–ST-Segment–Elevation Acute Coronary Syndromes A Scientific Statement for Healthcare Professionals From the American Heart Association Council on Clinical Cardiology. *Circulation*. 2007; 115:2549-2569. <https://doi.org/10.1161/CIRCULATIONAHA.107.182615>
10. Khot UN, Khot MB, Bajzer CT, Sapp SK, Ohman EM, Brener SJ, et al. Prevalence of Conventional Risk Factors in Patients With Coronary Heart Disease. *JAMA*. 2003; 290(7):898-904. <https://doi.org/10.1001/jama.290.7.898>
11. Kumar A, Cannon CP. Acute coronary syndromes: diagnosis and management, part I. *Mayo Clin Proc*. 2009; 84(10):917-38. [https://doi.org/10.1016/S0025-6196\(11\)60509-0](https://doi.org/10.1016/S0025-6196(11)60509-0)
12. Paudel R, Panta OB, Paudel B, Paudel K, Pathak OK, Alurkar VM. Acute Coronary Syndrome In Elderly – The Difference Compared with Young in Intensive Care Unit of a Tertiary Hospital in Western Nepal. *Journal of Clinical and Diagnostic Research*. 2009; 3:1289-1296.
13. Goch A, Misiewicz P, Rysz J, Banach M. The Clinical Manifestation of Myocardial Infarction in Elderly Patients. *Clin. Cardiol*. 2001; 32(6):E46–E51. <https://doi.org/10.1002/clc.20354>
14. Su PH, Chen PY, Lee SY, How CK, Chien DK, Chang WH. Comparison of clinical presentations and outcomes between adult and elderly acute myocardial infarction patients in emergency department. *Health Technol*. 2019; 3(7): 1-12. <https://doi.org/10.21037/ht.2019.08.01>
15. Tai S, Li X, Yang H, Zhu Z, Tang L, Fu L, et al. Sex Differences in the Outcomes of Elderly Patients with Acute Coronary Syndrome. *Cardiology Research and Practice*. 2020; 5091490: 1-8. <https://doi.org/10.1155/2020/5091490>
16. Dong X, Cai R, Sun J, Huang R, Wang P, Sun H, et al. Diabetes as a risk factor for acute coronary syndrome in women compared with men: a meta-analysis, including 10 856 279 individuals and 106 703 acute coronary syndrome events. *Diabetes Metab Res Rev*. 2017;33(5): E2887. <https://doi.org/10.1002/dmrr.2887>