Original Research Article Journal of National Heart & Lung Society Nepal
Vol-3. No. 2, Jul-Dec 2024 DOI:10.3126/jnhls.v3i2.71646 ISSN: 2091-0657 (Online & Print)

Clinico-Demographic Profile of Patients with Acute Coronary Syndrome Presenting to Emergency Department in a Tertiary Care Setting in Nepal

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Received: 15th June, 2024 Accepted: 14th August, 2024 Published: 20th December, 2024

ABSTRACT

Background: ACS patients in South Asia present approximately a decade earlier than their counterparts in developed nations due to the high prevalence of modifiable risk factors like hypertension, diabetes, and smoking. This study aimed to find the clinico-demographic profile of ACS patients in a tertiary care hospital in Nepal.

Methods: A descriptive cross-sectional study was conducted retrospectively at Patan Hospital from July 2022 to July 2024. Data from 375 patients with ACS were reviewed, including age, sex, comorbidities, and coronary angiogram findings. The data were analyzed using descriptive statistics.

Results: The mean age of patients was 60.81 ± 10.75 years, with 54.13% being male. Hypertension (30.67%) and diabetes (21.07%) were the most prevalent comorbidities. Coronary angiograms revealed normal arteries in 51.20% of patients, while 22.93%, 12%, and 9.97% had single-vessel disease (SVD), double-vessel disease (DVD), and triple-vessel disease (TVD), respectively. Management strategies included medical management for 57.87% of patients, while 39.47% underwent percutaneous coronary intervention (PCI).

Conclusion: The majority of the subjects with acute coronary syndrome were middle-aged males. The burden of ACS was exacerbated by prevalent risk factors such as hypertension, diabetes, and smoking. Timely diagnosis and management of ACS, including early initiation of medical management and appropriate use of interventions like percutaneous coronary intervention (PCI).

Keywords: *acute coronary syndrome; demographics; myocardial infarction.*

INTRODUCTION

Myocardial infarction (MI) is a leading cause of morbidity and mortality worldwide, with a particularly heavy burden in low- and middle-income countries (LMICs).[1] MI accounts for a significant number of early cardiovascular deaths in South Asia including Nepal and patients present to healthcare services at least an average of 10 years earlier than in developed countries.[2] Urbanisation and changes in lifestyle have accelerated the rise of cardiovascular disease by increasing the prevalence of these risk factors.[3] Hypertension is known to be an important risk factor for MI, affecting almost 40% of adults in Nepal.[4] The prevalence of smoking is still alarmingly high-especially among men-which substantially increases the risk for acute coronary syndromes.[5] Obesity drives diabetes causing an additional burden of risk for MI.[6] However, even with progress in reperfusion therapies such as percutaneous coronary intervention (PCI), the large burden of delayed treatment secondary to logistical and access issues for healthcare services is still considerable in Nepal.[7] Moreover, poor rural populations are often particularly vulnerable to socioeconomic barriers and less well-organized health care systems.[8] Various studies had noted a male predominance in MI in Nepal, with the majority of patients being in the 50–60-year age group.[9] Our study was done to find the clinico-demographic characteristics of MI patients who were admitted to a tertiary care hospital in Nepal to generate information which may help to lay the ground for evidence-based intervention needed in this ever-changing population.[10]

METHOD

A descriptive cross-sectional study was conducted retrospectively from July 2022 to July 2024 at Patan Hospital. After ethical approval, hospital records of the patients undergoing coronary angiograms for the clinical presentation of acute coronary syndrome (ACS) were reviewed. A total of 375 patients were included in the study and data regarding age, sex, comorbidities and coronary angiogram findings were

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recorded. Acute Coronary Syndrome is defined by the American Heart Association (AHA) as a range of conditions associated with sudden, reduced blood flow to the heart. ACS encompasses three major clinical entities:

1. ST-elevation myocardial infarction (STEMI): Characterized by a complete blockage of a coronary artery, leading to significant damage to the heart muscle as evidenced by specific changes on an electrocardiogram (ECG).
2. Non-ST-elevation myocardial infarction (NSTEMI): Involves a partial blockage of a coronary artery, resulting in heart muscle damage that can be identified by elevated cardiac biomarkers but without the specific ECG changes seen in STEMI.
3. Unstable Angina (UA): Occurs due to reduced blood flow through a coronary artery without evidence of myocardial damage, presenting as chest pain or discomfort that is new, worsening, or occurs at rest.

Coronary angiogram finding was considered normal if no stenosis was seen and non-critical if vessels were stenosed less than 50% of the luminal diameter. If more than 50% stenosis in one, two or three vessels was considered as single, double or triple vessel disease respectively. Data was entered in Microsoft Excel and analysis performed using IBM SPSS Statistics version 16.0. Descriptive statistics such as frequency were calculated and presented accordingly.

RESULTS

A total of 375 patients with clinical presentation of ACS were included in the study. The mean age of the patient was 60.81 years with standard deviation of 10.75 years. More than half of patients (54.13%) were male and 45.87% were female. The minimum age of patients was 30 years and maximum age was 87 years (Table 1).

Among all the patients presenting with clinical features of ACS, half of the patients (50.93%) had at least one comorbidities such as hypertension, diabetes, heart failure, COPD, dyslipidemia whereas 16.80% patients had more than one comorbidities. Hypertension and diabetes were prevalent among 30.67% and 21.07% of the patients (Table 2).

Table 1. Age-wise distribution of patients presenting with ACS in an emergency department of a tertiary care center in Nepal.

Age group (in years)	Frequency (%)
21 - 40	16(4.3)
41 - 60	172(45.9)
61 - 80	178(47.5)
>81	9(2.4)

Table 2. Frequency of comorbidities among patient presenting with ACS in an emergency department of a tertiary care center in Nepal.

Comorbidities	Frequency (%)
Hypertension	115(30.67)
Heart failure	36(9.60)
CKD	8(2.13)
COPD	10(2.67)
DM II	79(21.07)
Dyslipidemia	1(0.27)
Hypothyroidism	2(0.53)
Dilated Cardiomyopathy	3(0.80)

Coronary angiogram finding was normal in 51.20% of the patients with single vessel disease (SVD), double vessel disease (DVD) and triple vessel disease (TVD) in 22.93%, 12% and 9.97% of the patients respectively. Only 4% of the patients had stenosis less than 50% of the luminal diameter i.e. non-critical. (Table 3)

Table 3. Coronary angiogram finding of patients presenting with ACS in an emergency department of a tertiary care center in Nepal.

Vessel	Frequency (%)
Normal	192(51.20)
SVD	86(22.93)
DVD	45(12.00)
TVD	37(9.97)
Non-critical	15(4.00)

Intervention of >1 vessel in SVD and TVD was done in 3.47% patients.

Most of the patients were given medical management and 39.47% of the patients received percutaneous coronary intervention (PCI). The coronary bypass artery graft (CABG) and Plain old balloon angioplasty (POBA) was done in 4 patients each and two patients underwent temporary pacemaker implantation (TPI) (Table 4).

Table 4. Management modalities performed on patients presenting with ACS in an emergency department of a tertiary care center in Nepal.

Management	Frequency (%)
Medical management	217(57.87)
Percutaneous coronary intervention (PCI)	148(39.47)
Plain old balloon angioplasty (POBA)	4(1.07)
Coronary artery bypass graft (CABG)	4(1.07)
Temporary pacemaker implantation (TPI)	2(0.53)

DISCUSSION

The study throws light on the clinico-demographic profile of patients presenting with acute coronary syndrome (ACS) in tertiary care hospitals in Nepal. Such public health issues as ACS, specifically ST-Elevation Myocardial Infarction (STEMI), NSTEMI (Non-ST Elevation Myocardial Infarction) and unstable angina, are widely spread in the world. The observed mean age of 60.81 years, with a predominance of males (54.13%) of the patient, is consistent with other regional studies, where the onset of disease is found at an earlier age than that in developed countries because of unhealthy overt lifestyles and lack of medical facilities. This finding suggests that the targeted interventions to change the risk factors and early interventions for detection of the disease are warranted from an epidemiological perspective.[11] Our study documented hypertension (30.67%) and diabetes (21.07%) as major cardiovascular risk factors in patients with ACS. A study done in Nepal reported that 37.5% patients with ACS had hypertension and 26.78% had diabetes.[12] As with any vascular complication, the presence of diabetes adds insult to cardiovascular related factors such as endothelial dysfunction, irregularities in blood vessels as well as boosting the development and progression of atherosclerosis.[13] Coronary angiogram findings showed diverse disease presentations: 22.93% had single vessel disease (SVD), 12% had double vessel disease (DVD), and 9.97% had triple vessel disease (TVD), while 51.20% had normal coronary arteries. Logistical barriers and delays in timely intervention remain challenges in Nepal, as in other low to middle income countries (LMICs). System-wide healthcare reforms, including improved referral systems and expanded primary care networks, are critical to improving access to timely reperfusion therapies.[14] The majority (57.87%) of patients underwent medical management, while 39.47% had percutaneous coronary intervention (PCI), underlining the component of interventional cardiology in the management of acute coronary syndrome (ACS). Nonetheless, the scarce number of advanced therapeutic techniques such as coronary artery bypass graft (CABG) and temporary pacemaker implantation (TPI) exemplify the requirement of greater resources and training in tertiary care environments.[15]

CONCLUSION

The majority of the subjects with acute coronary syndrome (ACS) in this study were middle-aged males. The burden of ACS was exacerbated by prevalent risk factors such as hypertension, diabetes, and smoking. Timely diagnosis and management of ACS, including early initiation of medical management and appropriate use of interventions like percutaneous coronary intervention (PCI), are critical in reducing the morbidity and mortality associated with ACS.

Conflict of interest: None

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Citation: Mishra DK, Adhikari S. Clinico-Demographic Profile of Patients with Acute Coronary Syndrome Presenting to Emergency Department in a Tertiary Care Setting in Nepal. JNHLS. 2024; 3(2):109-112.