



CLINICAL PROFILE OF NSTEMI-ACS PATIENTS IN A TERTIARY CARE CENTRE, A PROSPECTIVE OBSERVATIONAL STUDY

General Medicine

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ABSTRACT

Ischemic heart disease may manifest as either chronic stable angina (CSA) or acute coronary syndrome (ACS). The spectrum of ACS includes ST elevation myocardial infarction (STEMI) and non-ST elevation ACS (NSTEMI-ACS) which comprises unstable angina and non-ST elevation myocardial infarction (NSTEMI). The proportion of ACS attributed to NSTEMI continues to increase, while STEMI is declining¹. NSTEMI usually results from severe coronary artery narrowing, transient occlusion, or micro embolization of thrombus and/or atheromatous material. NSTEMI is defined by an elevation Cardiac Biomarkers in the absence of ST elevation. The syndrome is termed unstable angina (UA) in the absence of elevated cardiac enzymes.⁴ This study was conducted on the clinical profile and outcomes of patients with NSTEMI-ACS.

KEYWORDS

NSTEMI-ACS, Unstable Angina, Trop T.

INTRODUCTION

Ischemic heart disease (IHD) or coronary artery disease (CAD) is a condition where there is an inadequate supply of blood and oxygen to a portion of myocardium; it typically occurs, when there is imbalance between myocardial oxygen supply and demand. The most common cause of myocardial ischemia is atherosclerotic disease of an epicardial coronary artery (or arteries) sufficient to cause regional reduction in myocardial blood flow and inadequate perfusion of the myocardium supplied by the involved coronary artery¹⁸. There are varied presentations of IHD/ CAD, amongst them Acute Coronary Syndrome (ACS) is an emergency. It is almost always associated with rupture of an atherosclerotic plaque and partial or complete thrombosis of the infarct-related artery¹⁹. While the incidence of STEMI is decreasing as a result of increased use of aspirin, statins, and reduced smoking, the incidence of NSTEMI-ACS is increasing due to the growing burden of obesity, diabetes, and chronic kidney disease in an aging population as well as the increasing detection of myocardial necrosis by troponin. The percentage of NSTEMI-ACS patients with NSTEMI is rising while the percentage with UA is decreasing. This is due to the increased use of highly sensitive troponin (hsTn) assays that have improved myocyte necrosis detection and can reclassify UA patients as NSTEMI. Diagnosis of NSTEMI-ACS is based largely on combination of history and clinical findings like Anginal chest discomfort, age, ECG, circulating troponins, etc. Assessment of risk can be accomplished by scoring systems like Thrombolysis in Myocardial Infarction (TIMI). Treatment includes Medical Management in the form of Anti-ischemic and anti-thrombotic agents followed by invasive strategy like CAG within 2 hours of presentation for unstable patients and within 24 hours in high risk stable patients, followed by coronary revascularisation (PCI or CABG) depending on coronary anatomy.

MATERIALS AND METHODS

The study was conducted in Intensive Care Unit (ICU) under the department of General medicine in tertiary care hospital. This study was conducted among 150 patients, admitted in intensive care unit (ICU), under the department of General medicine, with the diagnosis of NSTEMI-ACS.

Inclusion Criteria

1. Patients ≥ 18 years of age
2. Patient fulfilling the diagnostic criteria of NSTEMI and UA

Exclusion Criteria

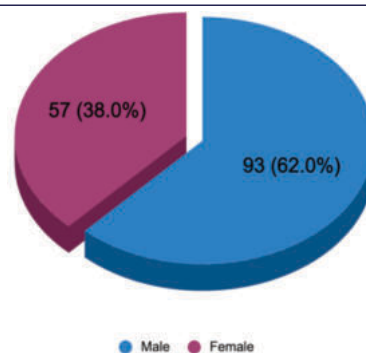
Patients not fulfilling the inclusion criteria and/or not willing to participate.

The relevant data were collected in person by the investigator from the daily case record of the patients pertaining to the intensive care unit (ICU) under the department of General medicine.

OBSERVATION AND RESULTS:

Demographic Profile of the Study Participants: -

Of the total 150 study participants, 93 (62 %) belonged to males and 57 (38 %) belonged to females, as depicted in Figure 1.



The total number of study participants [N = 100] were divided into 3 groups, based on their different age groups.

Sr. No.	Age group in years	No. of patients (%) [N=150]
1	< 40	6 (4)
2	≥ 40 to < 60	81 (54)
3	≥ 60	63 (42)

Clinical Profile of the Study Participants: -

Out of 150 study participants diagnosed with non-ST segment acute coronary syndrome (NSTEMI-ACS), 147 (98%) had multiple risk factors, as depicted in Figure-2

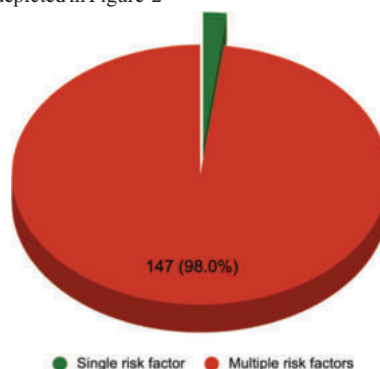
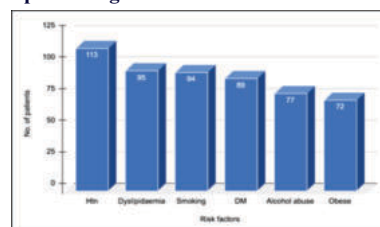


Figure-3: Distribution of Risk Factors for NSTEMI-ACS Among Study Participants Diagnosed with NSTEMI-ACS.



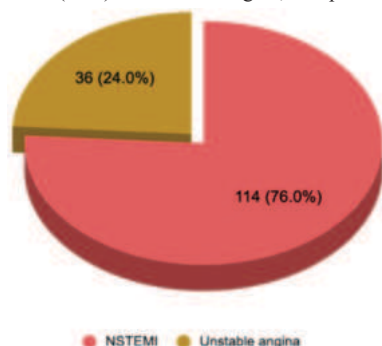
Types of dyslipidemia in study participants diagnosed with NSTEMI-ACS.

Sr.No.	Lipid profile	No. of patients (%) [N=95]
1	Total Cholesterol level ≥ 200 mg/dl	42 (44.2)
2	Triglyceride level > 150 mg/dl	37 (39)
3	LDL level > 100 mg/dl	8 (8.4)
3	HDL level	
	a. In females <50 mg/dl	6 (6.3)
	b. In males <40 mg/dl	2 (2.1)

Distribution of nutritional status in study participants diagnosed with NSTEMI-ACS-

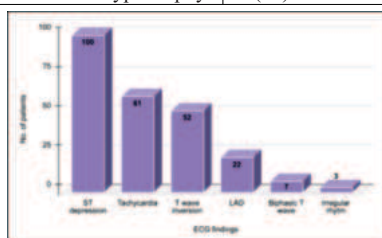
Sr. No.	BMI (Kg/m ²)	Category	No. of patients (%) [N=150]
1	<18.5	Under Weight	0 (0%)
2	18.5 -22.9	Normal	2 (1.3)
3	23 - 24.9	Overweight	37 (24.7)
4	≥ 25	Obese	111 (74)

Out of total 150 study participants diagnosed with NSTEMI-ACS, 114 (76%) had non-ST segment elevation myocardial infarction (NSTEMI) and 36 (24%) had unstable angina, as depicted in Figure-4



Electrocardiogram (ECG) findings in study participants diagnosed with NSTEMI-ACS.

Sr. no	2-D Echo findings	No. of patients (%) [N=150]
1	LVSD according to EF	
	a. $\geq 40\%$ $< 60\%$	a. 65 (43.3)
	b. $< 40\%$	b. 55 (35.7)
	c. Normal ($\geq 60\%$)	c. 30 (20)
2	RWMA	110 (73.3)
3	Concentric hypertrophy	78 (52)



2-D echocardiography findings in study participants diagnosed with NSTEMI-ACS

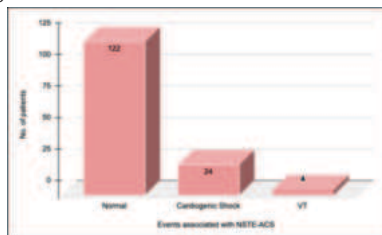


Figure-5: Bar Diagram Depicting the Distribution of Various Events Associated with NSTEMI-ACS Among Study Participants.

The distribution of treatment outcome in study participants with diagnosed NSTEMI-ACS-

Sr. No.	Treatment outcome	No. of patients
1	Discharged	139
2	Death	11
	Total Patients	150

DISCUSSION

In Out of 150 study participants, 93 belonged to males and 57 belonged to females. The prevalence of NSTEMI-ACS was highest among the age group 40 - 60 years with a mean and median age of 56.5 years and 56 years respectively, which accounted for 81 (54 %) cases. All of the study participants belonged to below poverty line (BPL).

Majority of our study population had more than one risk factors (98%), out of which hypertension (17.5%) was most commonly associated with NSTEMI-ACS, followed by dyslipidemia (63.3%). Most common presentation seen was typical chest pain, accounting for 141 (59.7 %) cases. Non-ST segment elevation myocardial infarction (NSTEMI, 76%) was more common than unstable angina (UA, 24%) among the study population. Most of the study participants (74%) belong to obese category of Body Mass Index (BMI) with a value of ≥ 25 kg/m².

Highly sensitive Troponin T was positive in 79.3% of the study participants. The most common electrocardiogram (ECG) findings were, ST segment depression (66.7%), whereas T-wave inversion was seen in 34.7% of the cases. On two-dimensional echocardiography (2-D Echo), left ventricular systolic dysfunction (LVSD) was found in 80% of study participants, followed by regional motion abnormalities (RMWA) seen in 73.3% of the cases and concentric ventricular hypertrophy (52%). Majority of the study population (43.3%) had ejection fraction between 40% - 60%.

All of the study participants received conservative medical therapy, comprising of anti-platelets and anti-coagulants. Out of 150 study participants, 81.33% of them had no complications associated with the disease, while 18.7% had eventful course, out of which, cardiogenic shock (16%) was most common complication encountered. Majority of the cases (92.7%) recovered and were discharged with required medical advice.

CONCLUSION

From this cross-sectional study, we can draw some valuable points regarding the sociodemographic and clinical profile of study participants presenting with NSTEMI-ACS in tertiary care hospital. The present study was hospital- based, hence almost all of the study participants belong to poor class strata (below poverty line). The mean age of patients presenting with NSTEMI-ACS was 56.5 years with majority of the study population (54 %) belongs to the age group 40 years - 60 years. Young patients aged <40 made up a small but not insignificant part of the population presenting with the NSTEMI-ACS. Hypertension (21.7%) was the most common risk factor present in patients followed by dyslipidaemia (17.5%), smoking (17.4%) and diabetes (16.5%). Arterial hypertension is one of the main factors leading to atherogenesis and the development of vulnerable plaques whose instability or rupture (which in turn results in thrombosis and vessel occlusions) are responsible for the development of acute ACS. Prevalence of hypertension is reportedly 30%-40% among patients with an ST.elevation MI (STEMI) and rises up to 70% in patients with a non-ST.elevation MI (NSTEMI)^{101,102,103}. Dyslipidaemia increases risk of ACS, importance of dyslipidaemia in the pathogenesis of CAD is well known. Elevated levels of cholesterol, LDL-C and triglycerides and decreased level of good cholesterol, HDL have been found in Indian subjects with CAD and been postulated to be of particular importance even in the younger variant of the disease. Smoking has been shown to be a major dominant modifiable risk factor associated with young CAD. In diabetes, specifically, diffuse coronary artery disease, metabolic derangements, complexity of the culprit atherosclerotic plaque, microangiopathy, endothelial dysfunction, impaired fibrinolysis, increased platelet aggregatory activity, and diminished flow reserve may be responsible for developing CAD. Majority of cases (76%) in this study had a diagnosis of non-ST-elevation myocardial infarction, as compared to unstable angina (24%), depicting delay in seeking treatment among study population. Twenty eight patients (18.7%) had disease related complications. Complications like cardiogenic shock and ventricular tachycardia were noted. Cardiogenic shock (16%) was the most common complication and Ventricular tachycardia (2.7%) were the least frequent. There was a mortality rate of 7.3% in the present study, which was comparable to the other regional states. All of the patients were given conservative medical therapy, timely, leading to a good discharge rate of 92.7%. Invasive therapies like Percutaneous Coronary intervention or stenting (PCI) and Carotid artery bypass grafting (CABG) were not done due to unavailability of resources in tertiary care hospital.

Finally, it is important to screen for ACS even in young adults. The time with a saying that ACS is a disease of older adults is gone. Therapeutic approaches that increase and accelerate the achievement of satisfactory reperfusion at the cellular level may further improve prognosis in patients presenting with NSTE-ACS. Risk factor modification is crucial and the importance of smoking cessation, following an appropriate diet, achieving and maintain optimal weight, daily exercise, blood pressure control, control of hyperglycemia and an LDL-C < 55 mg/dl should be emphasized.

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