Original Article

Prescribing Pattern of Acute Coronary Syndrome in A Tertiary Care Hospital

Syeda Zuleqaunnisa Begum*[1], Ummul Khair Afifa Fatima[2], Shireen Fatima[2], Mohammed Safi Ullaha Shareef[2]

1. Assistant Professor, Department of Pharmacy Practice, Deccan School of Pharmacy, Telangana, India.
2. B. Pharmacy Students, Deccan School of Pharmacy, Telangana, India.

***Corresponding author's E-mail:** syedazuleqaunnisa@gmail.com

Received: 10-06-2024; **Revised:** 25-09-2024; **Accepted:** 10-10-2024; **Published on:** 15-10-2024.

ABSTRACT

Introduction: The term "ACS" refers to patients who are suspected of experiencing acute myocardial ischemia or infarction as a result of a dramatic reduction in coronary blood flow. NYHA scale classifies patients based on their physical ability into four Stages indicating the symptoms of ACS. Risk assessment plays a decisive role in the management of acute coronary syndrome (ACS). The GRACE scores are among the most frequently used risk assessment tools.

Aim: The aim of the study is to analyze the current prescription pattern of drugs used in the treatment of Acute Coronary Syndrome. To classify the patient using New York Heart Association (NYHA). To analyze the classification of drugs and assess ACS risk and mortality and medication adherence.

Materials and methods: The present study was conducted on 50 patients diagnosed with ACS of both genders the patient's prescription pattern was collected based on specially designed proforma from the inpatient department of Cardiology. The prescription pattern was analyzed.

Result: There were 29 males and 21 females in present study. The most commonly used drugs were anticoagulants. From the past medical history analysis various comorbid conditions were found to be associated with Acute Coronary Syndrome, Hypertension the most prevalent comorbidity, followed by Diabetes Mellitus. In our study majority of ACS were of the patients of myocardial infarction, Most frequently prescribed group of drugs were from Antiplatelets (72% of the cases), Statins (64%), Thrombolytics (43%) and Anticoagulants (62%).

Conclusion: Early detection and prompt treatment with antiplatelets, anticoagulants, thrombolytics, and statins are crucial. Both healthcare professionals and patients should focus on managing these risks and adopting healthier lifestyles to effectively prevent and manage ACS.

Keywords: Acute Coronary Syndrome, Prescription, Beta Blockers, Statins.

INTRODUCTION

The term "ACS" refers to patients who are suspected of experiencing acute myocardial ischemia or infarction as a result of a dramatic reduction in coronary blood flow. There are three forms of ACS:ST elevation myocardial infarction (STEMI), non-ST-elevation myocardial infarction (NSTEMI), and unstable angina (UA). Myocardial infarction (MI) is the permanent damage of heart muscle caused by a prolonged lack of oxygen flow. However, unstable angina is employed when there is myocardial ischemia but no obvious myocardial necrosis.[1]

The main characteristic of ACS is persistent chest pain; may present as pressure, squeezing, or burning type; and may radiate to the neck, shoulder, jaw, back, upper abdomen, or either arm. Diagnosis is presumed and treatment is given based on the patient's complaints and electrocardiogram (ECG). ECG intimates ST-elevation in the leads indicating STEMI, peaked upright or inverted T-waves referring to acute myocardial injury and the early stages of transmural Q-wave MI. Persistent ST-depression may also indicate non-Q-wave MI. Cardiac markers (troponin T or I and creatine kinase MB subforms) are the sensitive determinants of ACS. Myoglobin and CK-MB subforms are the early markers of acute ischemia. Cardiac troponin levels increase 3–12 h after the onset of pain, peak at 24–48 h, and return to baseline over 5–14 days.

CK-MB is first elevated 3–12 h after the onset of pain, peaks in 24 h, and returns to baseline in 48–72 h.[2] The common risk factors for the disease are smoking, hypertension, diabetes, hyperlipidemia, male sex, physical inactivity, family obesity, and poor nutritional practices. Cocaine abuse can also lead to vasospasm. A family history of early myocardial infarction (55 years of age) is also a high-risk factor. The classic symptom of ACS is substernal chest pain, often described as crushing or pressure-like feeling, radiating to the jaw and/or left arm.[3]

Prehospital care may include oxygen, aspirin, and nitrates, as well as hospital transport. Anticoagulants, antiplatelets, and antianginals are among the therapeutic drugs utilized. In challenging cases, angiography may be used to examine the structure of the coronary artery. Reperfusion therapy consists of fibrinolysis, percutaneous coronary intervention (PCI), and coronary artery bypass grafting (CABG). Typically, STEMI patients need immediate reperfusion treatment, such as PCI,

CABG, or fibrinolytic therapy. Dual anticoagulant medicines may be required for early invasive therapy in patients with NSTEMI. Conservative therapy with a single anticoagulant may be utilized for unstable angina reference same as NYHA.

The NYHA scale classifies patients based on their physical ability into four Stages:

Stage 1 Indicating no limitation to ordinary physical activity,

Stage 2 Indicating mild breathlessness and fatigue, and slight limitation during ordinary activity,

Stage 3 Indicating a marked limitation of physical activity due to breathlessness and fatigue even during less-than-ordinary activity, and

Stage 4 Indicating severe symptoms even at rest. [4]

Risk assessment plays a decisive role in the management of acute coronary syndrome (ACS). The GRACE scores are among the most frequently used risk assessment tools. The GRACE score was calculated by adding the points for each of the following eight prognostic variables: age, history of heart failure, history of acute myocardial infarction, heart rate and SBP at admission, ST-segment depression, serum creatinine, and elevated myocardial necrosis markers or enzyme.[5]

Medication adherence is a complicated multifactorial behavior, it is important to ensure the accurate and practical tool for measuring medication adherence in routine medical practice to understand the medication behavior of patient. Morisky et al. developed a self-reported scale with 4 items regarding common medication-taking behaviors leading to omission of drug.[6]

AIM:

The aim of the study is to analyze the current prescription pattern of drugs used in the treatment of Acute

Coronary Syndrome (STEMI, NSTEMI, UA)

OBJECTIVES:

1. To classify the patient using New York Heart Association (NYHA).
2. To analyze the classification of drug used for the treatment of ACS.
3. To assess the ACS risk and mortality using Grace ACS risk and mortality Score calculator.
4. To assess the Adherence Using Morisky Medication Adherence Scale
5. To Reduce the number of Hospital Days.

MATERIALS AND METHODS

1. **Study Design**: prospective, observational study.
2. **Study Population**: Inpatient of cardiology department, Owaisi Hospital and Research Center.
3. **Sample Size** :50
4. **Criteria**:

- **Inclusion**:

1. Patient >25 years of age of both the genders.

2. Patient with comorbid conditions (HTN, Dyslipidemia, DM, thyroid, CKD)

3.Patient with history of ACS.

- **Exclusion**:

1. Outpatients

2. Patient <25 years of age

3. Pregnant and lactating women.

4. Patient with bleeding disorders, Thrombocytopenia, psychiatric patients, cardiac cancer.

Data collection form included sociodemographic information such as age, gender, family history, personal history, relevant laboratory data, treatment chart and patient interview (attender).

RESULT

In this study we evaluated 50 patients' case records during period of 2 months. Out of 50 patients 29 (58%) were male and 21(42%) were female patients. most commonly belong to age group of 20-30 years (4%) followed by age group of 31- 40 years (8%), 41-50 years (14%), 51-60 years (28%), 61-70 years (26%) and 7180(18%), 81-90(2%).

Table 1: Distribution of Patients Based on Gender

Gender	No. of patients	Percentage
Male	29	58%
Female	21	42%

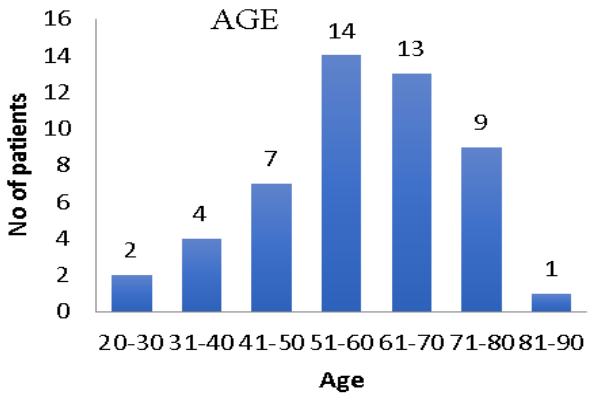

Figure 1: Graphical representation of patients based on age

The personal habits among 50 patients were include zarda chewer 2 patients (4%), smoker 9 patients (18%), alcoholic 2 patients (4%), Tobacco chewer 2 patients (4%).

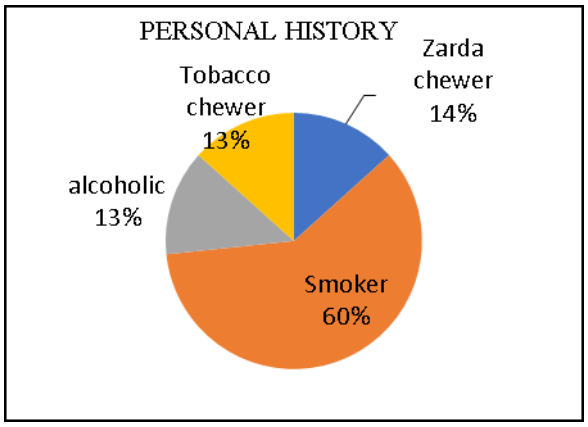

Figure 2: Graphical representation of patients based on personal history

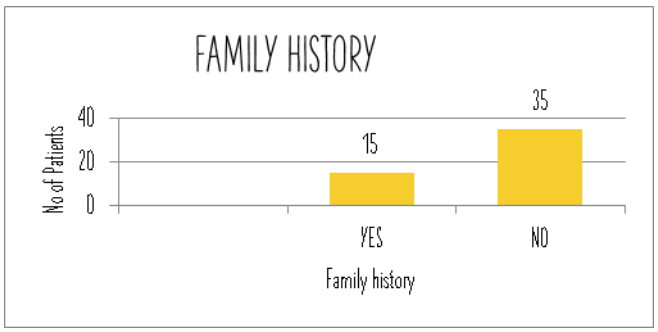

Figure 3: Graphical representation of family history

From the past medical history analysis various comorbid conditions were found to be associated with Acute Coronary Syndrome, Hypertension the most prevalent comorbidity, followed by Diabetes Mellitus. Whereas COPD, Rheumatoid Arthritis and Thyroid Disorders were reported from the patients.The comorbid conditions include Hypertension 28 patients (48%), CKD 1 patient (2%), Diabetes Mellitus 25 patients (43%), Thyroid 2 patient (3%), COPD 1 patient (2%), Rheumatoid arthritis 1 patient (2%).

Table 2: Percentage distribution of patients based on comorbid conditions

Comorbid conditions	No. of patients	Percentage
Hypertension	28	48%
CKD	1	2%
Diabetes Mellitus	25	43%
Thyroid	2	3%
COPD	1	2%
Rheumatoid arthritis	1	2%

The study showed that the predominant symptom of ACS was chest pain contributing to 33 patients (66%) of total cases and the other presented symptoms like profuse sweating 2 patients (4%) vomiting 2 patients (4%), cough 3 patients (6%) and Shortness of breath 10 patients (20%).

Table 3: Percentage distribution of patients based on presenting chief complaints:

Chief complaints	No. of patients	Percentage
Shortness of breath	10	20%
Chest pain	33	66%
Sweating	2	4%
Cough	3	6%
Vomiting	2	4%

Table 4: Percentage distribution of patients based on diagnosis

Diagnosis	No. of patients	Percentage
Electrocardiogram	15	30%
Troponin levels	25	50%
Angiography	10	20%

According to ECG levels the patients diagnosed with ACS include 15 patients (30%), troponin levels 25 patients (50%) and through Angiography 10 patients (20%).

The classification of heart Failure according to NYHA in patients diagnosed with ACS include Class I 11patients (22%), Class II 16 patients (32%), Class III 18 patients (36%) and Class IV 5 patients (10%).

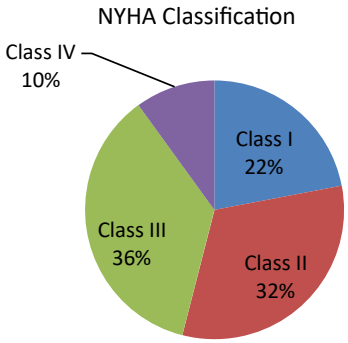

Figure 4: Graphical representation of heart failure according to NYHA

In our study majority of ACS were of the patients of myocardial infarction, most frequently prescribed group of drugs were from Antiplatelets (72% of the cases), Statins (64%), Thrombolytics (43%) and Anticoagulants (62%).

Table 5: Drugs Used in The Treatment Of ACS:

Drugs	No. of patients	Percentage
Antiplatelets	36	72%
Thrombolytics	43	86%
Anticoagulants	31	62%
Statins	32	64%

Among the additional drugs prescribed out of 50 patients 33 were prescribed pantaprazole (66%), 20 were

prescribed diuretics (40%) and 14 were prescribed paracetamol (28%), and 43 patients were prescribed Antihypertensives (86%).

Table 6: Additional drugs

Drugs	No. of patients	Percentage
Pantaprazole	33	66%
Diuretics	20	40%
Paracetamol	14	28%
Antihypertensives	43	86%

Using Morisky Medication Adherence Scale the patients with high, medium and low adherence was found to be 13(26%),27(54%),10(20%).

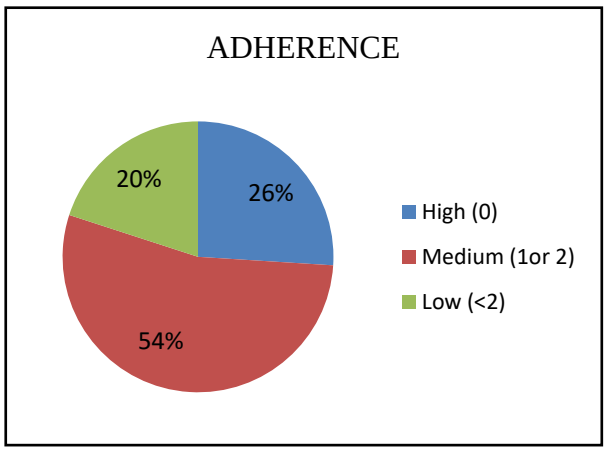

Figure 5: Medication adherence

The high risk of mortality rate was found in 8 patients 16%, moderate risk 11 patients 22%and 31 patients 62% was found to be at low risk of mortality.

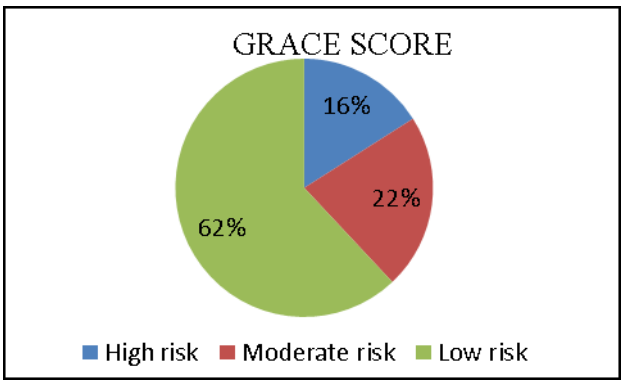

Figure 6: GRACE score

DISCUSSION

In this study which comprises 50 patients, most of them were males (29 patients,58%), and females' patients (21 patients, 42%), where as in the study conducted by Gifty Mariam et.al it was observed that out of total patients with ACS, 81.3% of them were males and 18.8% of them were females. Hence, there is more chance of Acute Coronary Syndrome (ACS) in males than females.

Gifty Mariam Raj et.al [7] assessed the prescription pattern of ACS and found that out of 16 patients with ACS, 18.8% of patients in the age group 41-50, 31.3% of patients in the age group 51-60, 25% of patients in the age group 61-70, 25% of patients in the age group and in the present study of 50 patients the majority of patients also belong to the age group 51-60(28%).

In the study assessed by Gifty Mariam Raj et.al, it was observed that out of total patients with ACS, 93.8% of them had chest pain, 56.3% had pain on arms and shoulders, 31.3% had sweated, 37.5% had shortness of breathing, 25% had palpitation, 18.8% had dizziness, 43.8% had a weakness. In the present study of 50 patients, the predominant symptom of ACS was chest pain contributing to 33 patients (66%) of total cases and the other presented symptoms like profuse sweating 2 patients (4%) vomiting 2 patients (4%), cough 3 patients (6%) and Shortness of breath 10 patients (20%). we concluded that patients with ACS had a greater chance of developing chest pain than other symptoms. In our study, prevalence of hypertension and type-2 diabetes is generally high. The pattern of comorbid conditions may vary with the study population. Avula Naveen, et.al [8] assessed that most frequently prescribed drugs were Antiplatelet agents same as in the present study.

CONCLUSION

This study highlights significant patterns in the prevalence and treatment of Acute Coronary Syndrome (ACS). ACS is more frequently observed in males, with hypertension and diabetes mellitus being the most common comorbid conditions. The majority of patients experience chest pain, and those aged 50-60 years are at a high risk. Smoking is identified as a critical risk factor. The primary treatments for ACS include antiplatelet drugs, anti-coagulants, thrombolytics, and statins, which are essential in the effective management of the condition. Early detection and prompt treatment with antiplatelets, anticoagulants, thrombolytics, and statins are crucial. Both healthcare professionals and patients should focus on managing these risks and adopting healthier lifestyles to effectively prevent and manage ACS.

Source of Support: The author(s) received no financial support for the research, authorship, and/or publication of this article

Conflict of Interest: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

1. Balaha MF, Alamer AA, Kabel AM, Aldosari SA, Fatani S. A Prospective Cross-Sectional Study of Acute Coronary Syndrome Patients' Quality of Life and Drug Prescription Patterns at Riyadh Region Hospitals, Saudi Arabia. Healthcare (Basel). 2023 Jul 7;11(13):1973. doi: 10.3390/healthcare11131973. PMID: 37444807; PMCID: PMC10341678.

2. Andhi, Nikhilesh; Desham, Prathyusha; Madavi, C.; Bhavana, S.; Naresh, D. Assessment of Quality of Life and Drug Prescription Pattern in Acute Coronary Syndrome. JOURNAL OF INDIAN COLLEGE OF CARDIOLOGY Jul–Sep 2022;12(3):111-118. DOI: 10.4103/jicc.jicc_50_21

3. Singh A, Museedi AS, Grossman SA. Acute Coronary Syndrome. [Updated 2023 Jul 10]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan.

4. Tscherny K, Kienbacher C, Fuhrmann V, van Tulder R, Schreiber W, Herkner H, Roth D. Risk stratification in acute coronary syndrome: Evaluation of the GRACE and CRUSADE scores in the setting of a tertiary care centre. Int J Clin Pract. 2020 Feb;74(2):e13444. doi: 10.1111/ijcp.13444. Epub 2019 Nov 22. PMID: 31667929; PMCID: PMC7027537.

5. Moon SJ, Lee W-Y, Hwang JS, Hong YP, Morisky DE. Accuracy of a screening tool for medication adherence: A systematic review and meta-analysis of the Morisky Medication Adherence Scale-8. PLoS ONE, 2017;12(11): e0187139. https://doi.org/10.1371/journal.pone.0187139

6. Sree Lekshmi R S et al. Ijppr. Human, 2021;22(3):26-41.

7. Naveen A, Sravani MR, Venkat JN. Drug utilization patterns in acute coronary syndrome at a tertiary care teaching hospital: A retrospective, non-interventional and observational study. The Pharma Innovation. 2017;6(9, Part H):538-44.