

## Original Research

### Analysis of Prescription pattern and drug utilization in patients with acute coronary syndrome at a tertiary care teaching hospital in Jharkhand

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#### ABSTRACT:

**Background:** Acute coronary syndrome (ACS) refers to a group of conditions that include ST-elevation myocardial infarction (STEMI), non-ST elevation myocardial infarction (NSTEMI), and unstable angina. The present study was conducted to assess prescription pattern and drug utilization analysis in patients with acute coronary syndrome. **Materials & Methods:** The present study was conducted on 175 patients diagnosed with ACS of both genders. The drugs prescribed to the patients were evaluated whether the treatment given is in accordance with the guidelines provided by the ACC/AHA. **Results:** There were 110 males and 65 females in present study. The most commonly used anticoagulant was enoxaparin in 120 patients, commonly used antiplatelets was aspirin-clopidogrel combination in 135, thrombolytics was streptokinase in 26, statins was atorvastatin in 153, beta-blockers used was metoprolol in 104 and nebivolol in 65, nitrates was isosorbide mononitrate in 34, glyceryl trinitrate in 25 and ACEIs was ramipril in 145 patients. The difference was significant ( $p < 0.05$ ). Over 90% of drugs were prescribed as per ACC/AHA guidelines except nitrates in which 52 patients received not as per ACC/AHA guidelines. The difference was significant ( $P < 0.05$ ). The pattern of discharge medications prescribed to the patients was anticoagulants in 92%, antiplatelets in 95%, thrombolytics in 94.6%, statins in 99%, beta blockers in 97.5%, nitrates in 70% and ACEIs in 96%. **Conclusion:** Authors found that most of the drugs used for the management of ACS were as per According to the ACC/AHA guidelines.

**Key words:** Acute coronary syndrome, antiplatelets, beta blockers.

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#### INTRODUCTION

Acute coronary syndrome (ACS) refers to a group of conditions that include ST-elevation myocardial infarction (STEMI), non-ST elevation myocardial infarction (NSTEMI), and unstable angina.<sup>1</sup> It is a type of coronary heart disease (CHD), which is responsible for one-third of total deaths in people older than 35. Some forms of CHD can be asymptomatic, but ACS is always symptomatic.<sup>2</sup> ACS has been recognized as the widespread cause of death and disability which is expected to continue increasing in developing countries.

It develops due to atherosclerosis, leading to an impedance of one or more coronary arteries that supply blood to the heart, which causes an imbalance between myocardial oxygen supply and demand.<sup>3</sup>

ACS is a manifestation of CHD (coronary heart disease) and usually a result of plaque disruption in coronary arteries (atherosclerosis). 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 is also a high-risk factor.<sup>4</sup>

The aim of treatment of ACS is to bring back the patient into the normal activities and also to use the acute event to re-evaluate the plan of care, particularly lifestyle and risk factor modification. The initial treatment of ACS is achieved by coronary reperfusion using fibrinolysis and/or revascularization using Percutaneous Coronary Intervention (PCI) / Coronary Artery Bypass Graft (CABG), along with a combination of Anti-ischaemic and Anti-thrombotic agents.<sup>5</sup>

The major role of clinical pharmacologists in the management of ACS patients includes the prevention of drug-related problems, management of cardiovascular risk factors and to improve the rational use of drugs.<sup>6</sup> The present study was conducted to assess prescription pattern and drug utilization analysis in patients with acute coronary syndrome.

## MATERIALS & METHODS

The present study was conducted in the department of Medicine at Patliputra Medical College and Hospital, Dhanbad, Jharkhand from April to October 2019. It comprised of 175 patients diagnosed with ACS of both genders. All were informed regarding the study and written consent was obtained. Ethical clearance was taken before the study.

Patient data such as name, age, gender etc. was recorded. The past medical and medication history of each patient was recorded. The drugs prescribed to the patients were evaluated whether the treatment given is in accordance with the guidelines provided by the ACC/AHA. Every modification made on the therapy for the inpatients during the treatment period was updated on the data collection form and reviewed for the reasons of the same. Results were statistically analyzed for correct inference.

## RESULTS

**Table I Distribution of patients**

Total- 175		
Gender	Males	Females
Number	110	65

Table I shows that there were 110 males and 65 females in present study.

**Table II Prescribed drugs in the treatment of ACS**

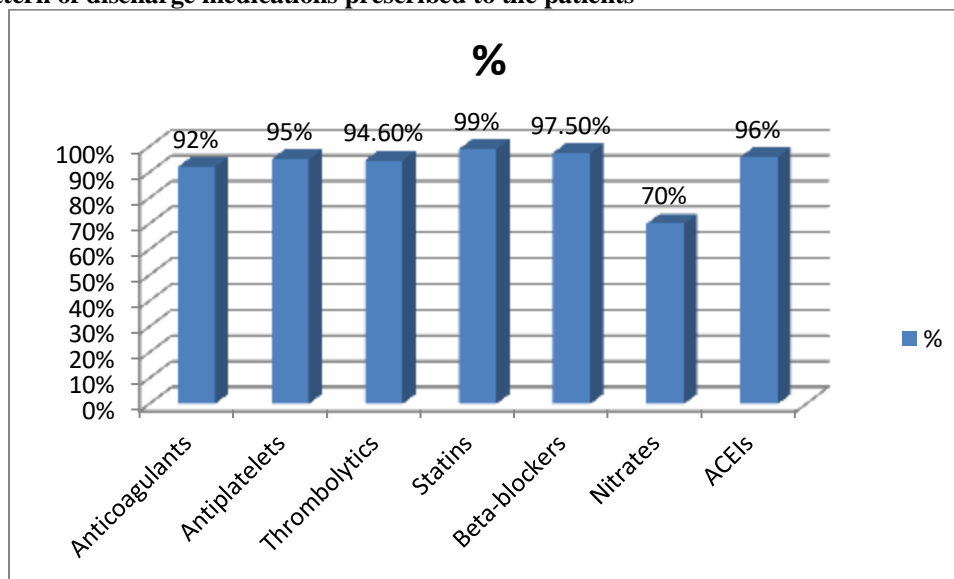
Drugs		Number	P value
Anticoagulants	Enoxaparin	120	0.05
	Heparin	58	
	Fondaparinux	76	
	Aspirin	90	
	Clopidogrel	82	
Antiplatelets	Aspirin-Clopidogrel combination	135	0.71
	Ticagrelor	110	
Thrombolytics	Streptokinase	26	-
Statins	Atorvastatin	153	-
Beta-blockers	Metoprolol	104	0.04
	Nebivolol	65	
Nitrates	Isosorbide Mononitrate	34	0.12
	Glyceryl Trinitrate	25	
ACEIs	Ramipril	145	-

Table II shows that most commonly used anticoagulant was enoxaparin in 120 patients, commonly used antiplatelets was aspirin-clopidogrel combination in 135, thrombolytics was streptokinase in 26, statins was atorvastatin in 153, beta-blockers used was metoprolol in 104 and nebivolol in 65, nitrates was isosorbide mononitrate in 34, glyceryl trinitrate in 25 and ACEIs was ramipril in 145 patients. The difference was significant ( $p < 0.05$ ).

**Table III Comparison of rate of recommended drugs prescribed as per ACC/AHA guidelines**

Drug	As per ACC/AHA Guidelines	Not as per ACC/AHA Guidelines	X <sup>2</sup>
ACEIs	168	7	131.2
DAPT	169	6	
Beta blockers	170	5	
Nitrates	123	52	
Statins	171	4	

Table III shows that over 90% of drugs were prescribed as per ACC/AHA guidelines except nitrates in which 52 patients received not as per ACC/AHA guidelines. The difference was significant ( $P < 0.05$ ).

**Graph I Pattern of discharge medications prescribed to the patients**

Graph I shows that pattern of discharge medications prescribed to the patients was anticoagulants in 92%, antiplatelets in 95%, thrombolytics in 94.6%, statins in 99%, beta blockers in 97.5%, nitrates in 70% and ACEIs in 96%.

## DISCUSSION

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.<sup>7</sup> This classic presentation is not seen always, and the presenting complaint can be very vague and subtle with chief complaints often being difficulty breathing, lightheadedness, isolated jaw or left arm pain, nausea, epigastric pain, diaphoresis, and weakness. Female gender, patients with diabetes, and older age are all associated with ACS presenting with vague symptoms. A high degree of suspicion is warranted in such cases.<sup>8</sup> The underlying pathophysiology in ACS is decreased blood flow to part of heart musculature which is usually secondary to plaque rupture and formation of thrombus. Sometimes ACS can be secondary to vasospasm with or without underlying atherosclerosis. The result is decreased blood flow to a part of heart musculature resulting first in ischemia and then infarction of that part of the heart.<sup>9</sup> The present study was conducted to assess prescription pattern and drug utilization analysis in patients with acute coronary syndrome.

In our study, there were 110 males and 65 females in present study. Most commonly used anticoagulant was enoxaparin in 120 patients, commonly used antiplatelets was aspirin-clopidogrel combination in 135, thrombolytics was streptokinase in 26, statins was atorvastatin in 153, beta-blockers used was metoprolol in 104 and nebivolol in 65, nitrates was isosorbide

mononitrate in 34, glyceryl trinitrate in 25 and ACEIs was ramipril in 145 patients.

Saju et al<sup>10</sup> included a total of 270 patients in the study in which males (219) dominated females (51) and were found in the age group of 60-69 years (92). Diabetes (62.9%) followed by hypertension (54.8%) were found to be the dominant risk factors. The prescribing frequency of dual antiplatelet therapy, statins, beta blockers, angiotensin converting enzyme inhibitors/angiotensin receptor blockers and nitrates was 93.3%, 97.3%, 94.1%, 76.3% / 14.1% and 41.2%. The treatment given to the patients was not completely in compliance with the ACC/ AHA guidelines (18.14%). The study provides an overall insight of the pattern of drugs prescribed to the patients with ACS which reveals the necessity of improving the rational prescribing of drugs in accordance with the standard guidelines.

We found that over 90% of drugs were prescribed as per ACC/AHA guidelines except nitrates in which 52 patients received not as per ACC/AHA guidelines. The pattern of discharge medications prescribed to the patients was anticoagulants in 92%, antiplatelets in 95%, thrombolytics in 94.6%, statins in 99%, beta blockers in 97.5%, nitrates in 70% and ACEIs in 96%.

Naveen et al<sup>11</sup> analyzed total of 68 case records of the patients diagnosed with Acute Coronary Syndrome (ACS) out of that 47 (69.11%) belongs to male patients and 21 (30.88%) were of female patients. The mean age of patient was 57 years; most of the patients belonging to age group of 51-60 years (36.76%). Number of patients undergoing thrombolysis were 30 (44.11%) and 38 (55.88%) underwent percutaneous coronary intervention (PCI). Total 526 drugs were prescribed in 68 patients. Most frequently prescribed drugs were

antiplatelet drugs like Clopidogrel and Aspirin, also Statins like Atorvastatin in 100% encounters. Average number of drugs per encounter was 7.73. Percentage of drugs prescribed by Branded name was 89.73%. Out of total drugs 283 (53.61%) were prescribed from National list of essential medicines 2015 and the Fixed Dose Combinations (FDC) were 22.43%.

Because statins alter the lipid profile primarily by lowering low-density lipoprotein rather than triglycerides, therapies that address triglyceride-rich lipoproteins may address the residual risk of events resulting from erosion that persists in the statin era more effectively than more intense low-density lipoprotein-lowering therapies. Moreover, therapies that destabilize neutrophil extracellular traps such as deoxyribonuclease administration might limit the propagation of thrombi resulting from superficial erosion.<sup>12</sup>

## CONCLUSION

Authors found that most of the drugs used for the management of ACS were as per According to the ACC/AHA guidelines.

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