

Drug utilization pattern in acute coronary syndrome at tertiary care hospital: a prospective cross-sectional observational study

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ABSTRACT

Background: To study the pattern of utilization of drug in the patients of Acute Coronary Syndrome at tertiary care hospital.

Methods: Prospective cross-sectional observational drug utilization study was conducted in patients of acute coronary syndrome admitted in ICCU, for the period of two months. Data was collected in preformed Case record form. Analysis was done by using drug use indicators, demographic pattern, morbidity pattern of disease, pattern of drug use. Data analysed using Microsoft Excel SPSS software - version 21.1. Total 71 cases were analysed.

Results: In our study we analysed 71 patients out of that 50 were male and 21 were female patients. The mean age of patient was 57.61±11.09 yr; most belonging to age group of 51-60 years (36.62%). Number of patients undergoing thrombolysis were 28(39.43%) and 43(60.57%) underwent percutaneous coronary intervention (PCI). Total 44 different drugs were used and 565 drugs were prescribed in 71 patients. Most frequently prescribed drugs were Clopidogrel and aspirin in 100% encounters, followed by atorvastatin (85%). Average number of drugs per encounter was 7.96. Percentage of drugs prescribed by generic name was 16.28%.

Conclusions: The present study provides valuable insight about the overall pattern of drug used in Acute Coronary syndrome. Physician should be encouraged to prescribe drugs with generic name.

Keywords: Acute coronary syndrome, Drug utilization

INTRODUCTION

Cardiovascular disease (CVD) is responsible for about 1/3 of deaths and likely to remain the prevalent eradicator globally.¹ Concerning the cardiovascular mortalities, projected number was 20 million in 2015 and more than 24 million expected by the year 2030.^{2,3} Incidence of CVD found to be greater than non-communicable diseases particularly occupied by three quarter portion of deaths about 86% of global burden of CVD reported among various developed countries.^{2,4}

Emerging field of cardiovascular diseases, acute coronary syndrome (ACS) considered as one of the leading causes

of mortality and morbidity worldwide. Acute coronary syndrome (ACS) is composed of ST elevation myocardial infarction, non ST elevation myocardial infarction, or unstable angina.⁵ The mortality rate with ACS is approximately 30% with more than half of these deaths occurring before the individual gets emergency care. An acute coronary syndrome may occasionally occur in the absence of electrocardiographic changes or elevations in biochemical markers, when the diagnosis is supported by the presence of prior documented coronary artery disease or subsequent confirmatory investigations⁶. In addition to primary prevention efforts, joint guidelines by the American College of Cardiology (ACC) and the American Heart Association (AHA) in 2010 suggest

secondary drug prevention measures to be used in patients with ACS.^{7,8} In conjunction with diet and lifestyle modifications, these guidelines suggest the use of statin, beta-blocker, and renin-angiotensin aldosterone system inhibitor drug therapies in ACS patients.^{7,8} Long term survival rate in post-acute coronary syndrome (A.C.S.) patients depends to a large extent on how well post A.C.S. period is managed.

Primary objective of this study is to study drug utilization pattern in acute coronary syndrome patients in patient admitted to intensive coronary care unit for first 48 hours.⁹ Drug utilization services practically appreciated in different clinical settings, health care management programs, hospitals and communities by considering therapeutic drug class and disease condition to assess the fundamental part of patient care system.¹⁰ The World Health Organization (WHO) regarded drug utilization as promotion, distribution, prescribing pattern and use of drugs within health care organization with main emphasis on therapeutics, societal and financial consequences.¹¹

METHODS

This is a prospective cross-sectional observational study. The study started after receiving approval of Institutional Review Board (IRB). Written informed Consent of patient was taken in vernacular language and confidentiality of all the data is maintained.

This study was conducted at Dr Jivraj Mehta Smarak Health Foundation Bakeri Medical Research Centre, Ahmedabad for the period of two months in patients of acute coronary syndrome. Inclusion criteria were 1) patient of age more than 18 years of either sex diagnosed and treated for Acute Coronary Syndrome. 2) Patients willing to give consent.

Demographic data like initials, age, sex, address, occupation and socio-economic class were recorded on the case record form. There after history of present illness, past history, family history, addiction, history of drug allergy and investigations were noted. The drugs prescribed to the patient including the dose, frequency, route of administration, duration of the treatment were noted on the case record form.

A statistical analysis was done by using the SPSS software - version 21 and Microsoft excel.

RESULTS

In our study we analysed 71 patients during period of 2 months. Out of 71 patients 50 were male and 21 were female patients (Figure 1). The mean age of patient was 57.61±11.09, most commonly belong to age group of 51-60 years (36.62%) followed by age group of 41-50 years (22.54%), 61-70 years (18.31%), 71-80 years (14.08%) (Figure 2).

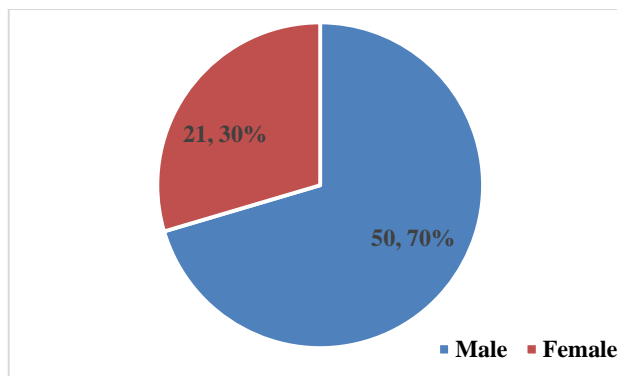


Figure 1: Gender wise distribution.

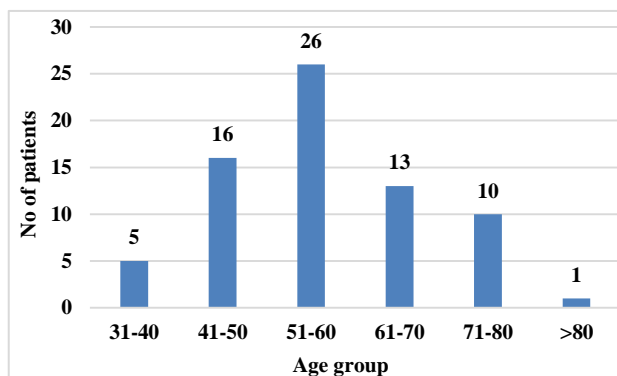


Figure 2: Age wise distribution.

Most of the patients were of myocardial infarction, 68 in number and others were of Unstable Angina. Only 28 (39.43%) number of patients underwent thrombolysis, while others (60.57%) had undergone for per cutaneous coronary intervention (PCI). Total 44 different drugs were used and 565 numbers of drugs were prescribed in 71 patients. Most frequently prescribed drugs were clopidogrel and aspirin in 100% encounter, followed by atorvastatin (85%), pantoprazole and ondansetron (Figures 3, 4). Among the analgesics tramadol was given in 39 (55%) patients and fentanyl was given in 10 (14%) patients. Heparin, an anticoagulant was prescribed in 36 (51%) patients (Table 1).

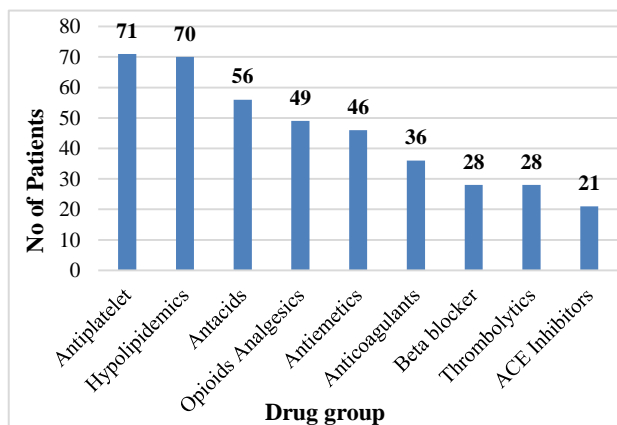


Figure 3: Most frequently prescribed groups.

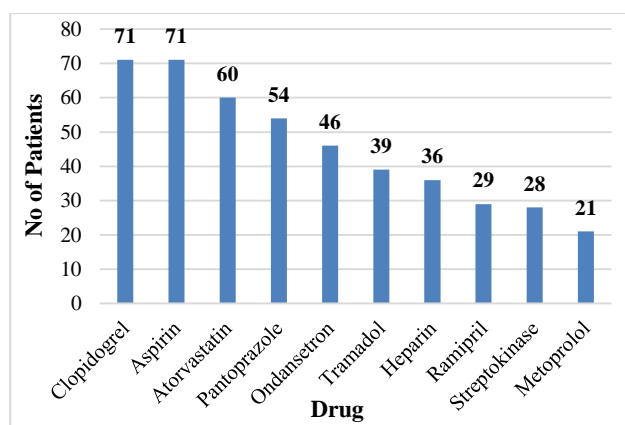


Figure 4: Most commonly prescribed drugs.

Table 1: Most frequently prescribed drugs.

Group of drugs	Name of drug	No of patients
Antiplatelet	Aspirin	71
	Clopidogrel	71
Hypolipidemic	Atorvastatin	60
	Rosuvastatin	10
Opioids analgesics	Tramadol	39
	Fentanyl	10
Anticoagulants	Heparin	36
Beta blocker	Metoprolol	21
	Atenolol	4
	Carvedilol	3
Thrombolytic	Streptokinase	28
ACE inhibitors	Ramipril	21
Anti-Angina	Isosorbide dinitrate	14
	Nitroglycerine	2
	Ivabridine	3
	Nicorandil	2
Antacids	Pantoprazole	54
	Ranitidine	2
Anti-emetics	Ondansetron	46

Average number of drugs per encounter was 7.96. Percentage of drugs prescribed by generic name was 16.28%. Out of 44 numbers of drugs 24 drugs were prescribed from National list of essential medicines 2015.

DISCUSSION

In our study mean age of patient is 57.61 ± 11.09 which is comparable to other study having mean age 57.05 ± 11.92 years and 60.6 ± 13.7 54.67 ± 13.42 .^{9,12,13} Most common age group was of 51-60 years (36.62%) which is similar to another study observed that a maximum number of patients, i.e., 39% were in the age group of 51-60 years.¹⁴ This shows that risk of acute coronary syndrome is common in older age group.

In our study most patients had myocardial infarction and only 3 had of unstable angina. We found that out of 71 patients 43 (60.57%) were undergone Percutaneous Coronary Intervention. This is comparable to other studies which shows increasing trends of PCI in Acute coronary syndrome.^{15,16} Early reperfusion is key to management of patients presenting with STEMI. If facilities are available, primary percutaneous coronary intervention (angioplasty with stenting) is treatment of choice for patients with STEMI.¹⁷ In acute coronary syndromes there is drift towards early invasive treatment and this is reflected in marked increase in cardiac care (catheterization laboratories and cardiac surgery centers) facilities throughout India.¹⁷

In our study most frequently prescribed drugs were antiplatelet clopidogrel and aspirin in 100% encounters, which is comparable as in other studies.^{9,15,18} The association of physicians of India recommends that all patients with MI, should receive dual antiplatelet therapy.¹⁷

Atorvastatin was prescribed in 60 (85%) patients and rosuvastatin in 10 (14%) patients, so hypolipidemic in total were prescribed in 70 (99%). This is comparable with another studies.^{9,18} ACE inhibitors and Beta blockers were prescribed in 29.58% and 39.39% of patients which shows underutilization of this drugs in ACS.

Average number of drugs per encounter was 7.96 which is less than that found in other studies.^{12,14} Only 16.28% of drugs were prescribed with generic name, which is very low in our study. Increasing generic prescribing would rationalize the use and reduce the cost of drugs. Out of 44 numbers of drugs 24 drugs were prescribed from National list of essential medicines 2015.¹⁹ The primary purpose of NLEM is to promote rational use of medicines considering the three important aspects i.e. cost, safety and efficacy.²⁰

CONCLUSION

Although small number of patients is limitation of our study, it points towards trends in drug utilization in ACS. The present study provides valuable insight about the overall pattern of drugs used in Acute Coronary syndrome. Physicians should be encouraged to prescribe drugs with generic name.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Deaton C, Froelicher ES, Shishani K, Jaarsma T. The global burden of cardiovascular disease. Eur J Cardiovasc Nurs. 2011;10(2):5-13.

2. Fuster V, Kelly BB. Promoting Cardiovascular Health in the Developing World: A Critical Challenge to Achieve Global Health. Institute of Medicine (US) Committee on Preventing the Global Epidemic of Cardiovascular Disease: Meeting the Challenges in Developing Countries. Washington (DC): National Academies Press (US). 2010.
3. Fuster V. Global Burden of Cardiovascular disease. *J Am Coll Cardiol.* 2014;64(5):520-2.
4. Abbas S, Kitchlew AR, Abbas S. Disease Burden of Ischemic Heart Disease in Pakistan and its Risk Factors. *Ann. Pak. Inst. Med. Sci.* 2009;5(3):145-50.
5. Cannon CP, Braunwald E. Non-ST-Segment elevation Acute Coronary Syndrome (Non-ST-Segment Elevation Myocardial Infarction and Unstable Angina. In: Kalper DL, Hauser SL, Jameson JL, eds. *Harrison's Principles of Internal Medicines.* 19th ed. New York, NY: McGraw-Hill. 2015:1593-98.
6. Scottish Intercollegiate Guidelines Network, Acute coronary syndromes, a national clinical guideline. 2007:5.
7. Braunwald E, Antman EM, Beasley JW. ACC/AHA guideline update for the management of patients with unstable angina and non-ST segment elevation myocardial infarction: 2002: summary article: a report of the ACC/AHA Task Force on Practice Guidelines. *Circulation.* 2002;106(14):1893-900.
8. Antman EM, Anbe DT, Armstrong PW. ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction-Executive Summary: a report of the ACC/AHA Task Force on Practice Guidelines. *Circulation.* 2004;110(5):588-636.
9. Ghosh A, Das AK, Pramanik S, Saha UK. Drug utilization study in patients of acute coronary syndrome on follow-up visits at a tertiary care center in Kolkata. *Asian Journal of Pharmacy and Life Science.* 2012;2(2):155-65.
10. Fahimi F, Baniasadi S, Behzadnia N, Varahram F, Tabatabaie LG. Enoxaparin Utilization Evaluation: An Observational Prospective Study in Medical Inpatients. *Iranian Journal of Pharmaceutical Research.* 2008;7(1):77-82.
11. Kaur S, Rajagopalan S, Kaur N, Shafiq N, Bhalla A, Pandhi P, et al. Drug utilization study in medical emergency unit of a tertiary care hospital in North India. *Hindawi Publishing Corporation, Emergency Medicine International.* 2014;1-5.
12. Patel BJ, Patel KH, Trivedi HR. Drug Utilization Study In Intensive Coronary Care Unit of A Tertiary Care Teaching Hospital. *NJIRM.* 2012;3(4):28-33.
13. Christian RP, Rana DA, Malhotra SD, Patel VJ. Evaluation of rationality in prescribing, adherence to treatment guidelines, and direct cost of treatment in intensive cardiac care unit: A prospective observational study. *Indian J Crit Care Med.* 2014;1(18):278-84.
14. Sandozi T, Nausheen F. Drug utilization study in ischemic heart diseases associated with Diabetes and hypertension. *IJBPS.* 2010;1(3):1-4.
15. Isezuo S. Characteristics, treatment and one-year outcomes of patients with acute coronary syndrome in a tertiary hospital in India. *Indian Heart Journal.* 2014;6:156-63.
16. Xavier D, Pais PP, Devreaux PJ. On behalf of the CREATE registry investigators. Treatment and outcomes of acute coronary syndromes in India (CREATE): a prospective analysis of registry data. *Lancet.* 2008;371:1435-42.
17. Association of Physicians of India. API expert consensus document on management of ischemic heart disease. *J Assoc Physicians India.* 2006;54:469-80.
18. Kamath A, Shanbhag T, Shenoy S. A Descriptive Study of the Influence of Age and Gender on Drug Utilization in Acute Myocardial Infarction. *Journal of Clinical and Diagnostic Research.* 2010;(4):2041-46.
19. National List of Essential Medicines. 2015. Available at <http://cdsco.nic.in/WriteReadData/NLEM-2015/NLEM,%202015.pdf>. Accessed on 12 January 2015.
20. Report of the core committee for revision of National List of Essential Medicines. November 2015. Available at <http://cdsco.nic.in/WriteReadData/NLEM2015/Recommendations.pdf>. Accessed on 12 January 2015.

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