Original Research Paper

Pharmacology

DRUG UTILISATION IN PATIENTS OF ISCHEMIC HEART DISEASE IN INTENSIVE CORONARY CARE UNIT IN A TERTIARY CARE HOSPITAL

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ABSTRACT Cardiovascular diseases are the most common cause of death. Patient admitted in ICCU (Intensive Coronary Care unit) are critically ill patients. Sufficient Information on drug utilization in patients of cardiovascular diseases are lacking in India.
OBJECTIVES: To assess the drug utilization pattern for ischemic heart disease (IHD) in ICCU of tertiary care hospital and to estimate total cost of drug therapy per patient from admission to discharge from ICCU.
METHOD: Prospective observational study done for the period of six months. Data of 100 patients with IHD were collected from case records.
RESULTS AND CONCLUSION: Among the drugs prescribed, 44% of drugs were antiplatelet. About 19.3% of drugs were prescribed in generic. The maximum number of stay in ICCU was 4-6 days. The cost of drug therapy varied according to the stay. The prescribing pattern of doctors can be improved by prescribing in generic form. The cost of the drugs prescribed depended upon the associated co-morbid conditions and duration of stay in ICCU.

KEYWORDS : Drug utilization, ischemic heart disease.

INTRODUCTION: Drugs play important role in improving health and human wellbeing. There are more effective medicines in the market than ever before. To produce the desired effect, they have to be safe and efficacious and have to be used rationally. Drug utilisation is an effective tool to evaluate the health care systems and to ascertain the role of drug. The World Health Organisation (WHO) defines drug utilization as *'The marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences'.*[1] It has been proved that cardiovascular diseases are the most frequent cause of morbidity and mortality throughout the world.[2] The critical care unit (CCU) is a place where multiple medications are prescribed to patients. The costs of hospitalization and treatment are high in CCU as patients are seriously ill and often suffer from the critical illnesses[3]. It is important to know drug utilization pattern to know the relevance in ICCU, frequency of drug usage, and whether drug used belonged to essential drugs list that are required for the patients admitted in ICCU.

MATERIALS AND METHODS: The study was started after obtaining the approval of institutional ethics committee. The study was conducted in Intensive Coronary Care unit (ICCU) at Pondicherry Institute of Medical Sciences, Pondicherry, India. Permission from cardiology department was obtained for the data collection. Data were collected from the patient's case sheet from their admission to discharge from ICCU without interfering their treatment. The data were collected based on the objectives of study, the age wise and the sex wise distribution of disease and the total drugs prescribed to the patients during the study period of six months from January 2015 to July 2015:number of anti-ischemic medications prescribed, number of antibiotics prescribed, number of drugs prescribed in generic name, number of drugs prescribed for co morbid conditions, number of injections prescribed, number of drugs prescribed from essential drug list of India were all noted. Length of ICCU stay and total direct cost of drug therapy per patient were also noted. The data collected were entered in Microsoft excel and analysed using descriptive statistics.

RESULTS: In the present study majority of ischemic heart disease patients were in the age group of 51-60 years (41%) with male predominance (82%). The most common encountered comorbid conditions were diabetes mellitus (59.7%) followed by hypertension (54.7%). In the present study 69% of drugs were prescribed for Ischemic heart disease. Among these drugs 44% of drugs were antiplatelet agents (clopidogrel and aspirin) and 20% of drugs

hypolipidemics (atorvastatin and rosuvastatin).
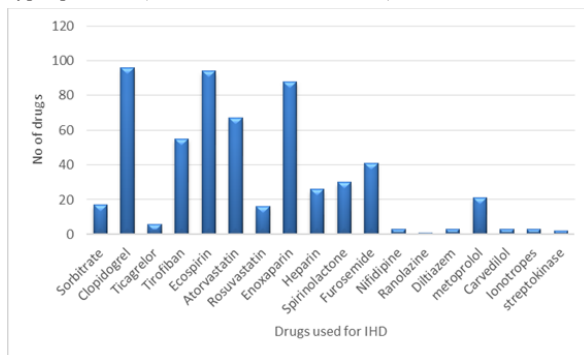
Figure (1) Drugs used for IHD

In present study Cefoperazone (35%) was commonly used antibiotic followed by ciprofloxacin (16%). Drugs prescribed by generic name was 19.30%. In present study drugs prescribed from National List of Essential Medicine, India 2011 was 56.30%.

The average duration of stay in ICCU of Ischemic heart disease patients were 5 days followed by 3 days.

Figure 3.Length of stay in ICCU

In present study the cost of drug therapy was calculated according to the generic and the brand price.

Table 1: Total cost of drug therapy per patient from admission to discharge from ICCU.

Length of stay		Average cost of drug therapy	
	(Generic)	(Brand price)(Rs)	
0– 3days	1895	4802	
4– 6 days	3082	8877.9	
7– 9 days	4364	12120	
10– 12 days	4426	11491	
>12days	22468	86415	

DISCUSSION: Total of 100 patient's data were collected and analysed. Present study shows that predominance of male (82%) which is higher than the previous study done by Pendhari et al [4] on cardiovascular emergencies which was 64.4% .Prevalence of heart disease is increasing with advancing age. In the present study when it was characterized in age wise distribution maximum number of patients were from the age group of 51-70 years. This above observation is comparable with study done by Rohan.P et al, who reported the age group of 51-70 years (60%).[5] In the present study the most common encountered comorbid conditions were diabetes mellitus (59.7%) followed by hypertension (54.7%). A study done by Pendhari *et al* on cardiovascular emergencies reported that hypertension was most commonly associated co-morbid condition which accounts for 46% which is lower to present study.[4] In our study 69% of drugs were prescribed for Ischemic heart disease. Among those drugs 44% of drugs were antiplatelet agents, which is similar to a study conducted by Mukesh *et al* where it was 48%.[6]

Anticoagulants (20%) were second commonly used drugs in our study. Among the anticoagulants low molecular weight heparin (LMWH i.e., Enoxaparin) was most commonly used drug (77%) followed by unfractionated heparin (UFH) which was 22%. This finding is somewhat similar to the study done by Pranay wal *et al* where the LMWH (77.3%) and UFH (13%) were commonly used.[7] In another study conducted by Patil SB *et al,* it was also found that LMWH (66%) was commonly prescribed anticoagulant.[8] Whereas Rohan P *et al* conducted a study in intensive cardiac unit where UFH was prescribed commonly (87%) followed by LMWH (4.8%) which is contradictory to our present study.[5] In our present study,it was observed that hypolipidemic agents (14.6%) were used. Among these, Atorvastatin was prescribed commonly (80%) followed by Rosuvastatin (19%) which is comparable to a study conducted by Mukesh *et al* where 16% hypolipidemic drugs were used .[6] In the present study 12.5% of drugs were diuretics among which furosemide (55%) was commonly used diuretic followed by spironolactone (42%). Nagabushan *et al* found that 5.6% of diuretics among which furosemide (75.0%) was most commonly prescribed followed by spironolactone (7.5%).[9] In our study beta blockers (4%) were used. Mukesh *et al* 2016 reported 20.3% of beta blockers.[6]

In our present study 12% of drugs were antibiotics, among which Cefaperazone was commonly used (35%) followed by Ciprofloxacin (16%). A study done by Nagabushan *et al* 6% of antibiotics were used which is lower than present study. The difference might be due to different nonspecific antibiotic policy followed by various hospitals. In our study the drugs used by generic name was 19.30%. In the study Shruthi *et al* the number of drugs prescribed in generic name was 3.77 % which was lower than our study. [10] we feel that increased generic prescription will rationalise the use and reduce the cost of the drugs. In the present study the number of drugs prescribed from essential drug list of India 2011 was 56.36%. This is similar to study by Aswani *et al* (57.05 %).[11] Nagabushan *et al* reported 75.1% drugs from essential list which is higher than present study. [9] This shows that large number of drugs which are commonly used for cardiovascular disorders are not represented in India essential drug list and revision of the drug lists is mandatory.

The average length of hospitalisation in present study was 4-6 days which is similar to our study done by Rohan P *et al* 4.42 ± 1.9 days.[5] In present study the cost of drug therapy per patient varied with duration of stay and associated co-morbid conditions. The maximum number of patient stay was between 4-6 days in which patients spend approximately 3082 rupees on drugs according to price of generic drugs. According to price by brand names the cost varied for upto 3 days was 4802 rupees, upto 6 days was 8877.9 rupees Rohan P *et al* reported that Mean cost of pharmacotherapy per patient when generic drugs were used was 2701.24 ± 3111.94.[5] These results show that prescribing in generic will reduce cost of the drugs and ultimately patients will be satisfied.

The present study has few limitations, the issues need to be addressed: first it was single centre study, the study population size is small which may not represent the entire IHD population, priority given to the usage of cardiovascular drugs.

Since the study was done in a single tertiary care hospital, results of the study cannot be extrapolated to the general population. Beta blockers and nitrates were used in very limited patients unlike other studies.

We have not calculated the indirect costs of illness like laboratory investigations, loss of earning, monetary loss to the attendant and procedures done prior to ICCU admission.

CONCLUSION: This study highlights the importance for rationalising drug therapy in emergency settings with regard to increasing adherence to national essential medicine list and necessity of prescribing of drugs by generic name. Needless to say that prescribing by generic name will reduce the cost of drug therapy by almost 50% which will reduce the burden of suffering patients.

REFERENCES
1. The selection of essential drugs: report of a WHO expert committee. World Health Organ Tech Rep Ser 1977; 615:1-36.
2. Kasper DL, Braunwald E, Fauci AS, Hauser SL, Longo DL, Jameson JL, Loscalzo J. Harrison's principle of internal medicine. 16th edition. McGrawHill medical publication; 2006. 1434-44.
3. John LJ, Devi P, John J, Guido S. Drug utilization study of antimicrobial agents in medical intensive care unit of a tertiary care hospital. Asian J Pharm Clin Res 2011; 4(1):81–4
4. Pendhari SR, Chaudhari DR, Burute SR, Bite BM. A study on the drug utilization trends in the cardiovascular emergencies in a tertiary care hospital. J Clin Diagn Res 2013; 7(4): 666–70.
5. Christian Rohan P, Rana DA, Malhotra SD, and 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; 18(5): 278–84.
6. Kumar M, Dahiya V, Mishra S, Sharma D, Mishra N, Lahkar M. Cardiovascular disease prevalence and drug utilization patterns at a tertiary care hospital in northeastern India. Int J Pharm Pharm Sci 2016; 8(6): 116-119.
7. Wal P, Wal A, Nair VR, Rai AK, Pandey U. Management of coronary artery disease in a Tertiary Care Hospital. J Basic Clin Pharm 2013; 4(2):31-5.
8. Patil SB, Raikar RS, Patil S, Raikar DR. Prescription pattern of cardiovascular drugs in intensive cardiac care unit patients in a tertiary care hospital. Int J Basic Clin Pharmacol 2015; 4(6):1100-03.
9. Nagabushan H, Roopadevi H S, Prakash G M, Pankaja R. A prospective study of drug utilization pattern in cardiac. Int J Basic Clin Pharmacol 2015; 4(3):579-583.
10. Dawalji S, Venkateshwarlu K, Thot S, Venisetty PK, Venisetty RK. Prescribing pattern in Coronary Artery Disease: A Prospective Study. IJPRR 2014; 3(3):24-33.
11. Aswani B, Reddy P, Yanadaiah P, Sujatha S. Study on prescribing pattern of cardiovascular drugs & potential drug - drug interactions in an inpatient cardiology unit of a Cardiac - Care Hospital at Tirupathi. Ejpmr 2016;3(8): 294-305.