INTRODUCTION: Drugs play an 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 utilization 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'. It has been proved that cardiovascular diseases are the most frequent cause of morbidity and mortality throughout the world. 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 critical illnesses. 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 National List of Essential Medicine, India 2011 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).

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.
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.**

<table>
<thead>
<tr>
<th>Length of stay</th>
<th>Average cost of drug therapy (Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–3 days</td>
<td>1895</td>
</tr>
<tr>
<td>4–6 days</td>
<td>3082</td>
</tr>
<tr>
<td>7–9 days</td>
<td>4364</td>
</tr>
<tr>
<td>10–12 days</td>
<td>4426</td>
</tr>
<tr>
<td>&gt;12 days</td>
<td>22468</td>
</tr>
</tbody>
</table>

**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. 7 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%). 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. 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%. 8

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 (UHF) which was 22%. This finding is somewhat similar to the study done by Pranay Wal et al where the LMWH (77.3%) and UHF (13%) were commonly used. 9 In another study conducted by Patil SB et al, it was also found that LMWH (66%) was commonly prescribed anticoagulant. 10 Whereas Rohan P et al conducted a study in intensive cardiac unit where UHF was prescribed commonly (87%) followed by LMWH (4.8%) which is contradictory to our present study. 10 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. 9 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%). 11 In our study beta blockers (4%) were used. Mukesh et al 2016 reported 20.3% of beta blockers. 9

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%). 12 Nagabushan et al reported 75.1% drugs from essential list which is higher than present study. 11 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. 1

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 ± 3111.92. 9 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 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**