DRUG UTILISATION STUDY IN INTENSIVE CARDIAC CARE UNIT OF A TERTIARY CARE HOSPITAL.

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ABSTRACT

Objectives: To evaluate the drug utilization pattern of drugs among patients in Intensive cardiac care unit of a tertiary care hospital.

Methods: A prospective study was carried out in the intensive cardiac care unit (ICCU) of Government Stanley medical college, for a period of 1 month. Demographics, indications for admission, comorbidities, duration of hospital stay and various drugs prescribed were observed and analysed statistically.

Results: Among the 110 patients, 63% were males, with mean age of 61±0.25 yrs. A majority of patients had diagnosis of acute myocardial infarction (90%). The average number of days of ICCU stay was 3, with average drugs prescribed per patient was 10. Diabetes mellitus and hypertension were the most common co-morbidities. The commonly prescribed drug classes were dual platelet inhibitors (aspirin, clopidogrel) (84%), Hypolipidemic drugs like statins (86%), Thrombolitics like streptokinase (72%), opioid analgesics (75%), anticoagulants (82%), ACE-inhibitors (39%), Angiotensin receptor blockers (10%) and antiangiial drugs like isosorbide dinitrate (45%), ranitidine (80%) to prevent peptic ulcer anxioytics (54%) and antiemetics (21%). Anti-infective were also prescribed (32%) and most commonly prescribed was ceftriaxone.

Conclusion: Drug utilization study was conducted with the aim of assessing the medical, social and economical consequences in the given setup. An evaluation on the quality of consumption of medication in the intensive cardiac care unit, their efficacy were analysed in order to identify priorities and any modifications that can be done if needed. It was found from this study that majority of the drugs were prescribed according to standard treatment guidelines.

Keywords: Drug utilization, intensive cardiac care unit, Myocardial infarction, tertiary care hospital

INTRODUCTION:

Cardiovascular disease includes atherosclerotic vascular diseases like coronary heart disease, cerebrovascular disease and peripheral arterial diseases. Health data compiled from more than 190 countries shows that heart disease remains the top most global cause of death with 17.3 million death each year, that is expected to rise to more than 23.6 million by 2030. Multiple risk factors contribute to the etiopathogenesis of cardiovascular diseases ranging from obesity, smoking, hypertension, hyperlipidemia, left ventricular hypertrophy indicating the need for multiple drugs according to the standard treatment protocol regimen.

Who’s definition for drug utilization is “marketing, distribution, prescription and use of drug in a society, with special emphasis on the resulting medical, social and economical consequences.” It is an essential part of pharmacoepidemiology. Drug utilization studies are important deciding factor to ascertain the role of drugs in the society, important basis for health care decision making. Drug utilization study is useful to know about description of drug use pattern, early signals of irrational use of drugs, interventions to improve drug use, and continuous quality improvement.

Pharmacotherapy which means use of drugs for prevention and treatment of diseases is a major branch of therapeutics. The prescription order is an important therapeutic transaction between the prescriber and the patient. So it should be scientifically legible, unambiguous, adequate and complete. It has been well accepted that inadequate and irrational prescriptions could lead to serious consequences.

The world health organization has formulated a set of core prescribing indicators for the improvement in rational drug use. It includes the prescribing indicators, patient care indicators and the facility indicators.

Rational use of drug is depend upon the knowledge about the prescription. The definition for rational use of drug is “The patients receive medications according to their clinical needs in dose that meet their individual requirements for an adequate period of time and at a lowest cost to them and their community.” Rational use of drugs can be effectively studied by drug utilization studies.
Many studies have been conducted about the burden of cardiovascular diseases and their risk factors, but studies on drug utilization pattern among patients admitted to intensive cardiac care unit are very few. This study was conducted to observe the common cardiovascular disorders necessitating ICCU admission, associated co-morbidities, duration of stay, study the drug utilization pattern among inpatients in ICCU.

**METHODOLOGY**

**Study design**
Prospective observational study

**Study period**
1 month (August 2016)

**Place of study**
Intensive cardiac care unit, Govt. Stanley Medical College.

**Study population**
Patients admitted in ICCU within 1 month (August 2016)

**Inclusion criteria:**
All patients of any age and of either sex admitted in Intensive cardiac care Unit within 1 month period.

This study was a prospective observational study which was carried out in the Intensive cardiac care unit of Government Stanley Medical college, for a period of one month. Prior permission was obtained from the Institutional Ethical committee and department of cardiology for conducting this study.

**Age, sex, diagnosis, duration of hospitalization, prescribing pattern such as name of the drug, dosage forms, frequency of dose were collected in the preformed case sheet.**

Commonly used drugs were classified based on WHO’s Anatomic Therapeutic Chemical (ATC) Classification System.

Drugs are classified in groups at five different levels. The drugs are divided into 14 main groups (first level), with two therapeutic/pharmacological subgroups (second and third levels). The fourth level is a therapeutic/pharmacological/chemical subgroup and the fifth level is the chemical substance. The second, third and fourth levels are often used to identify pharmacological subgroups when these are considered to be more appropriate than therapeutic or chemical subgroups.

**Statistical Analysis:**
The data collected were analyzed statistically using descriptive statistics, namely mean and standard deviation for quantitative variables.

**Results:**
Out of the total 110 patients admitted in ICCU during the study period of 1 month, 63% patients were male and 37% were female.

**Table 1: Sex distribution**

<table>
<thead>
<tr>
<th>Sex</th>
<th>% of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>63</td>
</tr>
<tr>
<td>Female</td>
<td>37</td>
</tr>
</tbody>
</table>

**Age distribution**
Mean age of 61 ± 0.25 yrs i.e., 25% patients in the age group of 51-60 yrs and 32% of patients were 61-70 yrs of age, showing higher incidence of cardiovascular diseases among elderly with male predominance.

**Table 2**

<table>
<thead>
<tr>
<th>Age</th>
<th>% of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40</td>
<td>12%</td>
</tr>
<tr>
<td>41-50</td>
<td>15%</td>
</tr>
<tr>
<td>51-60</td>
<td>25%</td>
</tr>
<tr>
<td>61-70</td>
<td>32%</td>
</tr>
<tr>
<td>&gt;70</td>
<td>12%</td>
</tr>
</tbody>
</table>

**Hypertension and diabetes mellitus are the major comorbid conditions associated with cardiovascular diseases.**

**Table 3**

Comorbidities associated with cardiovascular disorders among patients admitted in ICCU

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University Journal of Medicine and Medical Specialities
The average number of days of ICCU stay was 3, with average drugs prescribed per patient was 10. Hypolipidemics, anti-platelets, anti-anginals, anticoagulants, thrombolytics, are the commonly prescribed cardiovascular drugs. Initial treatment with parental drugs are needed as cardiovascular conditions are emergencies requiring rapid stabilization of the patient in order to prevent morbidity/mortality. Commonly used parenteral drugs are given in table 4

**Table 4:** Commonly used parental drug

<table>
<thead>
<tr>
<th>S.NO</th>
<th>Commonly used parental drug</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Opioid Analgesics</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>Anti coagulants</td>
<td>72</td>
</tr>
<tr>
<td>3</td>
<td>Thrombolytics</td>
<td>66</td>
</tr>
<tr>
<td>4</td>
<td>Antiemetics</td>
<td>45</td>
</tr>
<tr>
<td>5</td>
<td>Insulin</td>
<td>34</td>
</tr>
<tr>
<td>6</td>
<td>H2 blocker</td>
<td>32</td>
</tr>
<tr>
<td>7</td>
<td>Antibiotics</td>
<td>28</td>
</tr>
<tr>
<td>8</td>
<td>Diuretics</td>
<td>21</td>
</tr>
</tbody>
</table>

Out of the total 110 patients hypolipidemics (86%) were the most commonly used drugs and atorvastatin (80%) was the hypolipidemic widely prescribed. Heparin was the frequently prescribed anticoagulant. Aspirin and clopidogrel alone or the combination of aspirin and clopidogrel were the commonly used antplatelet drugs. Out of the total 84% patients who received antplatelet therapy 79% were given dual antplatelet drug combination. Among antianginal drugs prescribed to patients isosorbide dinitrate (84%), glyceryl trinitrate(16%), Streptokinase (72%) was used for the purpose of thrombolysis in MI patients and in NSTEMI patients in whom thrombolysis was contraindicated, heparin (8%) was used. Among ionotropes dobutamine was commonly used (17%) followed by dopamine (9%). Only 4 patients were prescribed antiarrhythmics and 2 among them received amiodarone, the rest 2 were treated with lignocaine. Opioid analgesics was widely used and morphine (62%) was majorly prescribed followed by pethidine (20%).

**Figure 6**

ATC classification of commonly prescribed drugs are given in Table 4.

**Table 4:** ATC classification of commonly prescribed drugs with the number of prescriptions
4. DISCUSSION

Drug utilization research was defined by WHO in 1977 as the “marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences”. Drug utilization study is an essential part of pharmacoeconomics as it describes the extent, nature and determinants of drug exposure. In our study drug utilization pattern of drugs in Intensive cardiac care unit was analysed. In our study Out of the total 110 patients admitted in ICCU during the study period of 1 month 63% patients were male and 37% were female. The of male predominance may be due to lifestyle changes, dietary habits and stress. Mean age of 61±0.25 yrs. Acute Myocardial infarction was the most common diagnosis in our study.

Most of the cardiovascular disorders are associated with multiple comorbidities which mandates the use of nearly 10 drugs as per standard protocols which were justifiable. The utilization of hypolipidaemic, antiplatelet agents and anticoagulant drugs was high and it is in accordance with the standard guidelines which were mentioned for the treatment of such emergencies. The main purpose of the ATC classification is as a tool for presenting drug utilization statistics. In our study streptokinase was the most commonly used fibrinolytic though newer plasminogen activators with less side effects available, as streptokinase is less expensive and effective. The use of high dose statin (80mg) was observed instead of low dose as used previously as recent studies have shown that intensive lipid-lowering therapy with 80 mg of atorvastatin per day in patients with stable CHD provides significant clinical benefit beyond that afforded by treatment with 10 mg of atorvastatin per day.

Various studies like CURE (Clopidogrel in unstable angina) found that addition of clopidogrel with aspirin reduce cardiovascular mortality nonfatal MI. In our study combination of aspirin and clopidogrel was used. ACE-inhibitors and ARBs was high in comparison to beta blockers as stated in various guidelines for treating myocardial infarction as ACE inhibitors and ARBs are beneficial by preventing fibrosis and cardiac remodelling compared to other anti hypertensives. Among adrenergic antagonists used carvedilol accounted for 55% of adrenergic antagonist as it causes vasodilatation and has antioxidant properties which are cardioprotective.

According to guidelines though morphine is the analgesic of choice to control cardiac pain the use of pethidine also noted in our study and found to be effective. H2 blocker was used for the prevention of ulcer. The use of antihypertensive was high containing diuretics, like furosemide, angiotensin converting enzyme inhibitors, Angiotensin receptor blockers. Among the diabetics on treatment, 85% were put on insulin during their stay in ICCU. It was found from our study that only standard treatment protocols were strictly followed. Health care systems can be involved in planning out implementation of patient friendly packs kits for standard treatment protocol for various disorders indicated.

5. CONCLUSION

Drug utilization study was conducted with the aim of assessing the medical, social and economical consequences in the given setup. An evaluation on the quality of consumption of medication in the Intensive cardiac care unit, their efficacy were analysed in order to identify priorities and if any modifications that can be done if needed. It was found from this study that majority of the drugs were prescribed according to standard treatment guidelines Similar drug utilization study with longitudinal surveillance should be done in ICCU frequently to collect more information on drug use pattern and comment on rationality of prescriptions.

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