AN EVALUATION OF DRUG USE PATTERNS IN ACUTE CORONARY SYNDROME PATIENTS USING WHO PRESCRIBING INDICATORS


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ABSTRACT
Many new potent, effective and expensive drugs have been introduced in the recent decade which has led to a steady increase and often misuse of drugs. Prescribing pattern of drugs reflects the clinical judgment of the clinicians. The present research project was designed to examine the drug use patterns among acute coronary syndrome patients with the aid of WHO prescribing indicators in a Tertiary care hospital. A prospective study carried out in 120 inpatients for a six month period. Data was analyzed from the inpatient Record. The average number of drugs per encounter was 4.4. Number of drugs prescribed by generic name was low(16.03%), injection prescribing was higher with 42.06%, antibiotic utilization is nearer to the limits(19.07) and higher number of drugs prescribed (75.92%) was from the National list of essential medicines(NLEM). The results indicate a considerable scope to improvise the concept of hospital formularies to achieve the rational drug use and the Drug use patterns. Successful interventions by a pharmacist to implement cardio protective medications to a cardiac disease patient's regimen would improve the patient's quality of care.

KEYWORDS: Drug use pattern, WHO, EDL, Prescribing Indicators, Acute coronary syndrome, Rational Drug Use.
INTRODUCTION
Rational drug prescribing is defined as the use of the least number of drugs to obtain the best possible effect in the shortest period and at a reasonable cost.\(^1\) Irrational prescribing leads to increased drug related problems such as adverse drug reactions, drug resistance and also increasing the cost of the therapy.\(^2\) Polypharmacy is a major problem with cardiovascular inpatients admitted for a longer period of time.\(^3\) Measurement of drug use in health care sector evaluates the drug use patterns and the behavior of prescribers which helps in identification of polypharmacy and associated problems.\(^4\) Monitoring of prescriptions provides a scope for identification of drug related problems and provides feedback to prescribers to create awareness about the irrational drug use.

Identifying polypharmacy, promoting the rational drug use and increasing the standard of medical treatment all these play a crucial role in improving therapeutic outcomes and the quality of life. The present study was aimed to assess drug use patterns in acute coronary syndrome using WHO prescribing indicators among inpatients admitted in the medical wards of tertiary care hospital, Bhimavaram.

OBJECTIVES
To study prescribing patterns in acute coronary syndrome patients.
To evaluate the inappropriate prescribing with the aid of WHO prescribing indicators.

MATERIALS AND METHODS
A prospective observational study was undertaken for six-month period from January 2013 to June 2013 in Tertiary care hospital, Bhimavaram, Andhra Pradesh, India. The study protocol was approved by the Institutional Ethics Committee. 120 consecutive patients presenting with acute coronary syndromes were identified by admission or discharge diagnoses were included in the study. Data were collected from medical records section about the inpatients admitted to medicine wards. Data was collected in a structured proforma which included patient’s demographic details, inpatient registration number, diagnosis and the drug prescribed in each prescription was critically analyzed using prescribing indicators to evaluate the rationality of the prescriptions.

ASSESSING PRESCRIBING INDICATORS
The core prescribing indicators include
1. average number of drugs per encounter
2. percentage encounter prescribed injections
3. percentage encounter prescribed antibiotics
4. percentage of drugs prescribed with generic name
5. percentage of drugs prescribed in the essential drugs list or formulary.[4]

PRESCRIBING INDICATORS
The WHO prescribing indicators were used in this study. The prescribing indicators that were measured included:
1. Average number of drugs per encounter
   \[
   \text{Average number of drugs per encounter} = \frac{\text{Total no of drugs prescribed}}{\text{Total no of encounters surveyed}}
   \]
2. % of encounters with injection prescribed
   \[
   \% \text{ of encounters with injection prescribed} = \frac{\text{Number of Patient encounter injection prescribed}}{\text{Total no of encounters surveyed}} \times 100
   \]
3. % of encounters with antibiotic prescribed
   \[
   \% \text{ of encounters with antibiotic prescribed} = \frac{\text{No of Patient encounters with antibiotic prescribed}}{\text{Total no of encounters surveyed}} \times 100
   \]
4. % of drugs prescribed by generic name
   \[
   \% \text{ of drugs prescribed by generic name} = \frac{\text{No of drugs prescribed by generic name}}{\text{Total number of drugs prescribed}} \times 100
   \]
5. % of drugs from EDL
   \[
   \% \text{ of drugs from EDL} = \frac{\text{Drugs prescribed from essential drug list}}{\text{Total no of drugs prescribed}} \times 100
   \]

DATA ANALYSIS
1. Sex wise distribution of ACS patients.
2. Age wise distribution of ACS patients.
3. Average number of drugs used per encounter.
4. Percentage of encounters with an injection prescribed.
5. Percentage of encounters with an antibiotic prescribed.
6. Percentage of drugs prescribed by generic name.
7. Percentage of drugs prescribed from the essential drug list or formulary.
8. Percentage of drugs prescribed from the National list of Essential Medicines.

All data in the ordinary prescribing indicator recording form were first analyzed manually and then using Microsoft Excel 2007. In the statistical analysis, data were analyzed for test frequencies, averages/means, standard deviation and percentages were obtained using Graphpad prism software.

RESULTS AND DISCUSSION

The present research project was designed to examine the drug use patterns among ACS patients with the aid of WHO prescribing indicators. In the study population of 120 patients, the male patients of 78 (65%) (95% CI, 53.85 to 59.30) were more prone to ACS than female patients of 42 (35%) (95% CI 54.52 to 61.57) as shown in table 1.

Table: 1 Gender distribution of ACS

<table>
<thead>
<tr>
<th>Gender</th>
<th>No</th>
<th>Percentage (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>78</td>
<td>65</td>
<td>53.85 - 59.30</td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
<td>35</td>
<td>54.52 - 61.57</td>
</tr>
</tbody>
</table>

Age wise categorization of the patients

Cardiac disorders progresses with the advancing age. There is a greater prevalence, which increases with the higher age. When categorized age-wise, maximum number of patients (31.60%) was from the age group 50-60 years, followed by 23.70% in more than 60 years of age. There was significantly lower number of patients in the younger ages, 1.60% in the age group 20 – 30 and 2.50% in the age group 30-40.
Table: 2 INCIDENCE OF ACS IN STUDY POPULATION

<table>
<thead>
<tr>
<th>Age group</th>
<th>Incidence</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-30</td>
<td>2</td>
<td>1.60%</td>
</tr>
<tr>
<td>30-40</td>
<td>3</td>
<td>2.50%</td>
</tr>
<tr>
<td>40-50</td>
<td>27</td>
<td>22.50%</td>
</tr>
<tr>
<td>50-60</td>
<td>38</td>
<td>31.60%</td>
</tr>
<tr>
<td>60-70</td>
<td>28</td>
<td>23.30%</td>
</tr>
<tr>
<td>70-80</td>
<td>17</td>
<td>14.10%</td>
</tr>
<tr>
<td>80-90</td>
<td>5</td>
<td>4.10%</td>
</tr>
</tbody>
</table>

The study shows that with increasing age the preponderance of male patients admitted with ACS decreases and sex ratio becomes smaller. This possibly reflexes a higher percentage of female and elderly population and more equal distribution of risk factors for ACS in both genders at high age group.\[5-6\]

Fig: 2 Pie Diagram Showing Incidence of Acs

DRUG USE PATTERNS IN ACS

There was not a single prescription wherein no drug was prescribed. Most patients received more than one medicine per encounter. Branded prescribing dominated (83.92%), 1342 among 1599 drugs prescribed, only 257(16.08%) drugs were prescribed by generic name as shown in figure 3.
The number of encounters with antibiotics was 89. Antibiotics constituted only 5.56% of the total number of encounters. Injectable drugs accounted for 36.58% of total encounters. The average number of drugs prescribed per encounter was between 4.4-4.48. The percentage of drugs prescribed by generic name was 16.08%. Percentage of prescribed injections was 36.58% and that of prescribed antibiotics was only 5.59%. The percentage of drugs prescribed from national EDL was 1214 drugs of 75.92%. The frequency of polypharmacy was higher in this hospital setting. One possible explanation is that, in tertiary care, patients seek expert advice from a health professional for very specific complaints, resulting in a tailored prescription and reducing the likelihood of use of various drugs.

Table: 3

<table>
<thead>
<tr>
<th>Prescribing Indicators assessed</th>
<th>Standard derived or ideal</th>
<th>AVG/PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of drugs per encounter</td>
<td>1.6-1.8</td>
<td>4.4</td>
</tr>
<tr>
<td>Percentage of encounters with an injection prescribed</td>
<td>13.4-24.1</td>
<td>42.06</td>
</tr>
<tr>
<td>Percentage of encounters with an antibiotic prescribed</td>
<td>20.0-26.8</td>
<td>19.07</td>
</tr>
<tr>
<td>Percentage of drugs prescribed by generic name</td>
<td>100</td>
<td>16.03</td>
</tr>
<tr>
<td>NLEM</td>
<td>100</td>
<td>75.92</td>
</tr>
</tbody>
</table>
The average number of drugs per encounter was found to be 4.43±1.87 in our study which are deviated from the standard prescribed. High prescription rates increases the risk of adverse drug reactions and drug interactions which affects the patient’s quality of care. Frequency of use of Injectable preparations was found to be high (42.06%) in ACS in comparison with WHO reference value .In present study we can observe that generic prescribing indicator shows a low range of usage at 16.03%, resulting in a chance for errors and polypharmacy. Generic prescribing is beneficial as it reduces the cost of drugs. However, it is interesting to notice that prescription pattern has a high usage of drugs from NLEM (75.92%) in ACS.

**CATEGORY WISE PREVALENCE OF VARIOUS DRUG CLASSES IN ACS**

<table>
<thead>
<tr>
<th>category</th>
<th>No of patients received the drug class</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statins</td>
<td>108</td>
<td>90</td>
</tr>
<tr>
<td>Nitrates</td>
<td>92</td>
<td>76.6</td>
</tr>
<tr>
<td>Anticoagulants</td>
<td>102</td>
<td>85</td>
</tr>
<tr>
<td>CCB’s</td>
<td>32</td>
<td>26.6</td>
</tr>
<tr>
<td>Analgesics</td>
<td>96</td>
<td>80</td>
</tr>
<tr>
<td>Anxiolytics</td>
<td>112</td>
<td>93.3</td>
</tr>
<tr>
<td>Beta-blocker</td>
<td>72</td>
<td>60</td>
</tr>
<tr>
<td>Diuretics</td>
<td>60</td>
<td>50</td>
</tr>
</tbody>
</table>
CONCLUSION

Based on the findings of this study we concluded that drug prescribing practices for average no of drugs injection prescribing shown deviation from the standard recommended by WHO evidencing the polypharmacy. It’s interesting to note that most of the drugs were prescribed from National List of Essential Medicines. Drug prescribing practices should be improved regardless of the level of health care delivery. Current study emphasizes the need to inform doctors about the problem of polypharmacy and to improvise the concept of hospital formularies to achieve the rational drug use. It is necessary to implement guidelines in order to achieve more appropriate prescribing patterns, to promote prescription based on the list of essential medicines. The present study could serve as a framework for further studies to investigate the scope for educational intervention in improving prescribing practices.

REFERENCES

