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## Assessment and Drug Utilization Pattern on Antiplatelet Agents in Cardiovascular Patients - A Prospective Study in Tertiary Care Hospital



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### ABSTRACT

**Background:** The main objective of drug utilization research is to assess the rationality of drug use. This study aims to manage the use of drugs in adults presenting with the severity of illness in a tertiary super specialty health center. Drug utilization research help in the identification of the exact use of drugs in population and its impact on the health care system. Symptomatic drug therapy is necessary for the safety of the patients and to decrease mortality and morbidity.

**Methodology:** A Prospective observational study was conducted in a tertiary care hospital for a period of 6 months. Inpatient ward with or without co-morbidities was included in the study. The useful data were obtained from patient case profiles, 200 cases were collected from general medicine wards, according to study criteria. **Results:** Total 200 impairment patients were admitted. In this 51-60 age group, patients have shown more usage of antiplatelet drugs. Out of 200 cases, female patients were 123 (61.5%) and male patients were 77 (38.5%). in this study maximum number of disease was found to be coronary artery disease 78 (39%), The most commonly prescribed antiplatelet was aspirin. Majority of the patients recovered. **Conclusion:** The most frequently prescribed drug group is antiplatelet. Before prescribing to the patients, evaluation of the medications with their suitable criteria is required. By minimizing the number of drugs per prescription, the irrational prescribing pattern of the drugs can be avoided by strictly following to the treatment guidelines and Ideal prescription writing.



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## INTRODUCTION:

Drug utilization pattern study is a solid investigation tool to evaluate present trends of drug use and appropriateness of prescriptions. It is an analytical and descriptive method of collection, quantification, understanding and evaluation of the prescribing pattern, as well as dispensing and consumption for the advancement of existing therapy and enhancement of patient safety and quality of treatment<sup>[1]</sup>. In order to identify the safe and effective drug utilization inappropriate is a common obstacle which was supported by many research studies throughout the world <sup>[2]</sup>. The Global Burden of Disease study estimated that 29.6 % of all deaths worldwide (15616.1 million deaths) were caused by CVD in 2010 so that it was estimated CVD is still the greater etiological and pathological factor for raise in a number of mortality. CVD sare the greater causative conditions for the mortality when compared with all the communicable, maternal, neonatal and nutritional disorders combined, and twice the number of deaths caused by cancers<sup>[3,4]</sup>. Medication quality provokes better patient safety and avoids inappropriate/ irrational prescribing pattern <sup>[5, 6]</sup>.

Different preventive strategies are implemented which are related to the rational use of drugs in the developed countries which decreased the risk associated with the occurrence of CVDs<sup>[7]</sup>. In tertiary care hospital by improving in drug prescription pattern and intervened use simultaneously leads to the proper compliance in the patient outcomes<sup>[3]</sup>. Possible therapeutic effect of a drug can be obtained at the right time by utilization of least number of drugs in a rationalized pattern <sup>[8]</sup>. The dramatic increase in the cases of patients with obesity, type 2 diabetes mellitus, and metabolic syndrome is associated with the risk factors like industrialization, urbanization and sedentary mode of lifestyle<sup>[9]</sup>. Physiological functions which are related to the autonomic nervous system, central nervous system, kidney, autocoids, and hormones are affected by the drugs used in the treatment of cardiovascular ailments <sup>[10]</sup>. Antiplatelets drugs like aspirin and clopidogrel are considered as the initiator drugs if they were dispensed within 90 days after hospitalization for the first MI<sup>[11]</sup>.

## MATERIALS AND METHODS:

### METHODOLOGY:

A hospital-based Prospective observational study was conducted in the Department of General Medicine of Manipal super specialty Hospital, Vijayawada, India. This study was conducted for a period of six months (July 2016 – Dec 2017). Their data was collected

regularly from the General Ward of Medicine, without interfering with their treatment. Each patient age, sex, diagnosis (only cardiac patients) and prescribed generic and brand names of the drugs were recorded in the prepared case record form. The collected data was analyzed to study- route of administration of drugs, antiplatelets prescribed for cardiac patients.

### Exclusion Criteria

Pregnant women. We excluded seriously ill and patients unable to communicate and Patients unwilling to participate in the study. Outpatients are not involved in this research.

### Data Analysis

Data was analyzed in MS Excel and descriptive statistics were used for analyzing the result of the study.

## RESULTS AND DISCUSSION:

### RESULTS:

**TABLE 1: Prevalent Diseases among Patients**

| S.NO | CASE                  | No of Patients | Male       | Female    | Percentage (%) |
|------|-----------------------|----------------|------------|-----------|----------------|
| 1.   | CAD                   | 78             | 57         | 21        | 39*H           |
| 2.   | Acute febrile illness | 22             | 9          | 13        | 11             |
| 3.   | Anemia                | 1 2            | 8          | 4         | 6              |
| 4.   | COPD                  | 16             | 10         | 6         | 8              |
| 5.   | Unstable angina       | 13             | 11         | 2         | 6.5            |
| 6.   | VHF                   | 32             | 13         | 19        | 16             |
| 7.   | Knee arthritis        | 13             | 7          | 6         | 6.5            |
| 8.   | MI                    | 14             | 8          | 6         | 7              |
|      | <b>Total</b>          | <b>200</b>     | <b>123</b> | <b>77</b> | <b>100</b>     |

CAD- Coronary Artery Disease, VHF- Viral Hemorrhagic Fever, COPD – Chronic Obstructive Pulmonary Disease, MI- Myocardial Infarction

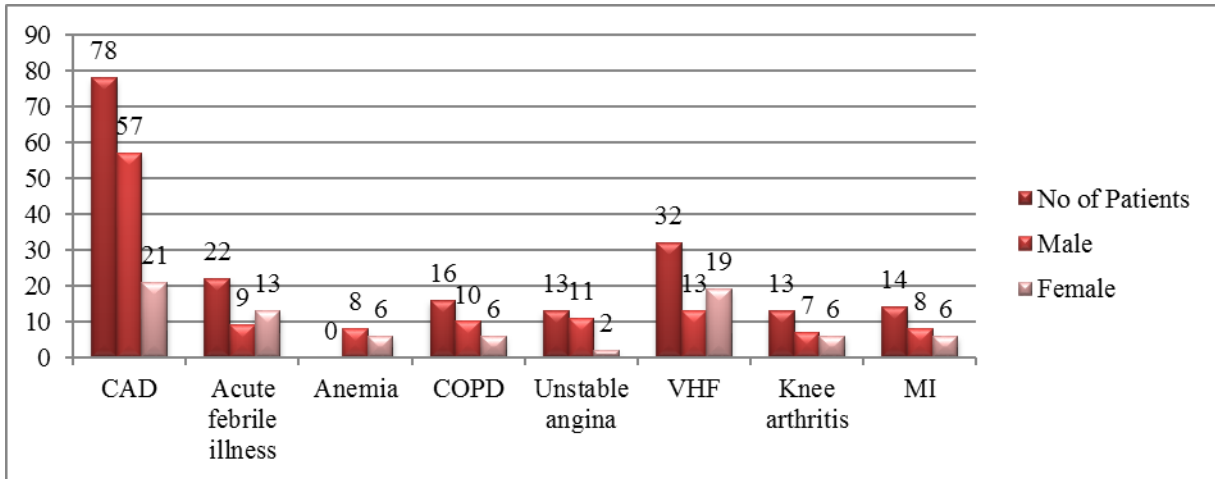


Fig. 1: Prevalent Diseases among Patients

Table 2: Shows distribution of the patients according to age groups

| Sr. No.   | Age group    | No of patients | Male      | Female    | Percentage (%) |
|-----------|--------------|----------------|-----------|-----------|----------------|
| 1.        | 21-30        | 15             | 9         | 6         | 7.5            |
| 2.        | 31-40        | 26             | 16        | 10        | 13             |
| 3.        | 41-50        | 43             | 28        | 15        | 21.5           |
| <b>4.</b> | <b>51-60</b> | <b>73</b>      | <b>46</b> | <b>27</b> | <b>36.5</b>    |
| 5.        | 61-70        | 32             | 18        | 14        | 16             |
| 6.        | 71-80        | 11             | 6         | 5         | 5.5            |
|           | Total        | 200            | 123       | 77        | 100            |

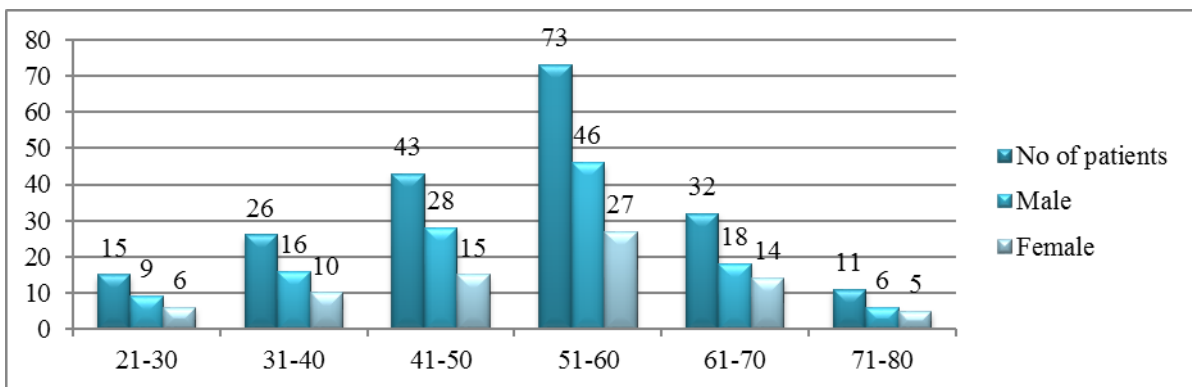


Fig. 2: Shows distribution of the patients according to age groups

**Table 3: Showed the prescribing pattern of different cardiovascular drugs**

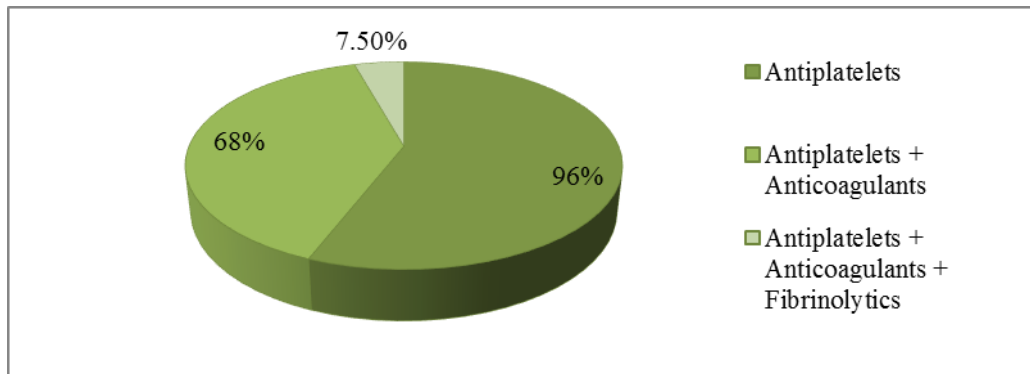
| S.No | Therapeutic Category     | No. of.Prescriptions | Percentage |
|------|--------------------------|----------------------|------------|
| 1.   | Hypolipidemic            | 164                  | 82         |
| 2.   | Antiplatelets            | 192                  | 96         |
| 3.   | Anticoagulants           | 116                  | 58         |
| 4.   | Fibrinolytics            | 32                   | 16         |
| 5.   | ACE inhibitors           | 95                   | 47.5       |
| 6.   | ARBs                     | 34                   | 17.5       |
| 7.   | β Blockers               | 87                   | 43.5       |
| 8.   | Calcium channel blockers | 55                   | 27.5       |
| 9.   | Antianginals             | 87                   | 43.5       |
| 10.  | Diuretics                | 122                  | 61         |
| 11.  | Cardiac glycosides       | 7                    | 3.5        |
| 12.  | Antiarrhythmic           | 27                   | 13.5       |
| 13.  | Inotropic                | 23                   | 11.5       |
| 14.  | Alpha blocker            | 7                    | 3.5        |
| 15.  | Vasodilator              | 8                    | 4          |

**Table 4: Prescription analysis**

| S.No | Prescription Catalog                                    | Results      |
|------|---|--------------|
| 1.   | Total no of case sheets analyzed                        | 200          |
| 2.   | Total no of drugs prescribed                            | 1517         |
| 3.   | Average no of drugs per patient                         | 7.5          |
| 4.   | Total no of cardiovascular drugs                        | 1198(78.97%) |
| 5.   | Average no of cardiovascular drugs per patient          | 5.9          |
| 6.   | Total no. of single drugs prescribed                    | 841(55.43%)  |
| 7.   | Total no of cardiovascular drugs prescribed orally      | 946(78.96%)  |
| 8.   | Total no of cardiovascular drugs prescribed injectables | 252(21.03%)  |
| 9.   | Cardiovascular drugs prescribed in generic names        | 726(60.60%)  |
| 10.  | Cardiovascular drugs prescribed in brand names          | 472(39.39%)  |

**Table 5: Combination of Anti-thrombotic Drugs Prescribed to the Patients**

| S.No | Drugs Categories                           | No. of. Patients | Percentage |
|------|--|------------------|------------|
| 1.   | Antiplatelets                              | 192              | 96%        |
| 2.   | Antiplatelets +Anticoagulants              | 136              | 68%        |
| 3.   | Antiplatelets+Anticoagulants+Fibrinolytics | 15               | 7.5%       |



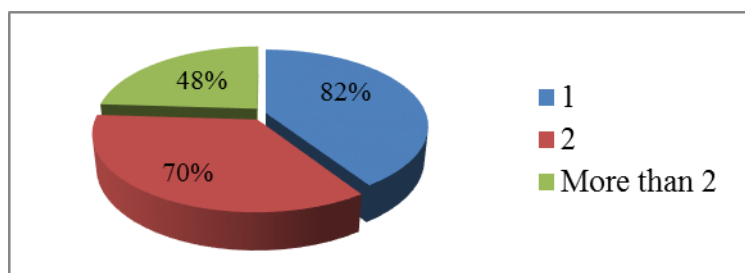
**Fig. 3: Combination of Anti-thrombotic Drugs Prescribed to the Patients**

**Table 6: Details of Anti-platelet Drugs Prescribed to the Patients**

| S.No | Antiplatelet drugs                 | No. of Patients | Percentage |
|------|------------------------------------|-----------------|------------|
| 1.   | Clopidogrel                        | 12              | 6%         |
| 2.   | Aspirin                            | 26              | 13%        |
| 3.   | Aspirin + Clopidogrel + Ticagrelor | 154             | 77%        |

**Table 7: List of Patients Simultaneously Suffering from Comorbid Illness**

| S.No | No of disease patients | No of patients | Percentage (%) |
|------|------------------------|----------------|----------------|
| 1.   | 1                      | 82             | 41             |
| 2.   | 2                      | 70             | 35             |
| 3.   | More than 2            | 48             | 24             |
|      | Total                  | 200            | 100            |



**Fig. 4: List of Patients Simultaneously Suffering from Comorbid Illness**

## DISCUSSION:

In this study maximum number of disease was found to be coronary artery disease 78 (39%), Followed by VHF, Acute Febrile Illness, COPD, MI, Unstable Angina & Knee Arthritis. the lowest rate of disease was found to be anemia 12 (6%). Percentages are 16%, 11%, 8%, 6.5%, 6% respectively. A total of 200 patients with cardiovascular disease were included in which male patients (61.5%) had a high frequency of cardiovascular incidence as compared to female patients (38.5%) as showed in (table 1). In our study out of 200 patients, 7.5 %, 13 %, 21.5%, 16%, and 5.5% patient belong to the age groups of 21-30 years, 31-40 years, 41-50 years, 61-70 and 71-80 years respectively (table 2). In this cardiovascular disease, 51-60 age group patients have shown more prevalent when compared to that of other age groups. The most commonly prescribed drug classes for main indications in coronary artery disease were anti-platelet drugs 192 (96%) followed by anti hyperlipidemics 164 (82%), diuretics 122 (61%). This was followed by anticoagulants 116 (58%) and ACE inhibitors 95 (47.5%) respectively. A total of 1517 drugs were prescribed to the study patients, out of which 1198 (78.97%) were cardiovascular drugs. The most common route of administration of these drugs was oral 946 (78.96%) and 252 (21.03%) drugs were prescribed in parenteral dosage forms. Among them 726 (60.60%) drugs were prescribed by generic names and 472 (39.39%) drugs were prescribed by brand names. An average of 5.9 cardiovascular drugs was prescribed per patient. Among the 200 patients, 12 (6 %) patients were treated only with clopidogrel while 26 (13%) patients were treated with aspirin only and 154 (77 %) patients were treated with aspirin+clopidogrel+ticagrelor. Among the 200 patients, 192 (96 %) patients were treated only with anti-platelets while 136 (68%) patients were treated with anticoagulants & antiplatelets and 15 (7.5 %) patients were treated with both of them Shows Disease Pattern Reported with comorbidities types of cardiovascular disease. Co-morbidity means the patient is simultaneously suffering from a number of diseases were observed

82(41%) cases as single morbidity, with single co-morbidity 70 (35%) cases and with more than single co-morbidity 48 (24%).

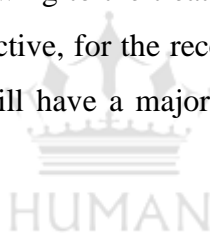
Prescribing drugs in generics rather than brand names favors in the reduction of drug duplication and cost-effectiveness of the drug [12]. Majority of the cases in this age group includes CADs. Increase in the number of cases of myocardial infarction in the age group of 51-60 is mainly due to sedentary lifestyle and comorbidities, which reduces the blood supply to the heart and because of deposition of cholesterol in arteries supplying blood to the heart leading to cardiac arrest. the use of various categories of drugs namely antiplatelet drugs, anticoagulants, antianginal drugs, beta-blockers, angiotensin converting enzyme inhibitors (ACEI)/angiotensin II receptor blockers(ARBs), Calcium channel blockers, diuretics, etc involves in the treatment for CAD. Our study showed a higher incidence of CVDs in males than the females and this trend was seen by increasing with age. These observations are similar to those of Saranya et al (male's 74% females, 26%) santadurga et al. (male 57% female 43%) Kamath et al (81% males and 19% females)[13, 14]. Majority i.e. 73(36.5%) patients ranged from 51 to 60 yrs of age, which is comparable to previous studies by Aswani et al showing 53 (29.44%), santadurga et al. 56 (31.11%) and Chandana et al. 15 (24.55%)<sup>[15,16,17]</sup>. In this study we also found that the average number of drugs prescribed per patient was 7.5 indicating polypharmacy, similar results were seen in the study of Aswani et al (5.58), santadurga et al. (5.08) and Kaur et al. (4.9) but studies by Al junid et al showed a higher incidence (7.56±3.37)<sup>[15,18,19,20]</sup>. In a study conducted by SupratimDatta, et al., the use of diuretics was (41%)<sup>[21]</sup> Andbattu Rakesh et al 65.65%<sup>[22]</sup>, whereas in the present study the prescription of diuretics was recorded as 61% the results of this study varied slightly from the previous studies. In a study conducted by TasneemSandozi et al., battu Rakesh et al., the drug utilization of various antiplatelet drugs were as aspirin alone (25.71%), (14.14%), aspirin &clopidogrel (81.81%), aspirin and clopidogrel (60.00%), whereas in the present study, the prescription rate of Aspirin alone was 13% and combination of aspirin &clopidogrel and ticagrelor (77%)<sup>[23,22]</sup>. in India and in many other south AsiancountriesCVD is the leading cause of morbidity and mortality when compared with rest of the world<sup>[24]</sup>. In Manipal hospitals, drugs like aspirin and clopidogrel are extensively used in the treatment of CVD patients. The frequency of these drugs is higher in males when compared with females. Only 8 prescriptions were not prescribed with anti-platelet drugs. The 96% drug utilization of anti-platelet drugs was observed at Manipal hospital Vijayawada and it was supported by the results of other studies in patients with the acute coronary syndrome at a tertiary care hospital



Kolkata shows 90% drug utilization of antiplatelet drugs and other cardiovascular drugs was observed [25]. IHD at a tertiary care hospital Kadapa shows 94.58% drug utilization of antiplatelet drugs [26].

## CONCLUSION:

In this study, it was observed the incidence of CAD was more common in male compared to female and the risk for coronary artery disease increased with increase in the age. The maximum number of patients was male; it may be due to smoking and alcoholic habits. In this cardiovascular disease, 51-60 age group patients have shown more prevalent when compared to that of other age groups. The most frequently prescribed drugs group is antiplatelet. Few drugs were prescribed by generic name. By prescribing the generics patients can be able to economize the expenses spent on the health-related problems. Before prescribing to the patients, evaluation of medications with suitable criteria is required. By minimizing the number of drugs per prescription, the irrational prescribing pattern of the drugs can be avoided by strictly following to the treatment guidelines and Ideal prescription writing. So, the treatment will be effective, for the recovery of the normal life of the patient. The development of the formulary will have a major impact on prescribers and healthcare professionals & for clinical practice.



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