Assessment of Drug Utilisation in Cardiovascular Disease Patients at a Tertiary Centre

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Abstract:

Background: Cardiovascular diseases are a group of disorders that affect the heart and blood vessels. Globally, CVD is a leading cause of morbidity and mortality. Cardiovascular diseases are responsible for 1.5 million deaths in India annually. Hypertension is linked to 57% of all stroke deaths and 24% of all coronary event deaths.

Aims and Objectives: The present study was conducted to assess drug utilisation in patients with cardiovascular diseases.

Material and Methods: A prospective observational study was consists of 102 patients of both genders admitted to OPD of Medicine department. Parameters include the typical number of drugs prescribed per prescription, the percentage of drugs prescribed using their generic names, the percentage of prescriptions containing antibiotics, the percentage of prescriptions containing injections, and the percentage of drugs prescribed from the essential drug list.

Results: The average number of drugs prescribed per prescription (≤3) was seen in 15%, the percentage of drugs prescribed by generic name (100%) in 23%, the percentage of prescriptions with an antibiotic prescribed (≤30%) in 35%, the percentage of prescriptions with an injection prescribed (≤10%) in 96%, and the percentage of drugs prescribed from the national EDL (100%) in 98%. Cardiovascular drugs prescribed were diuretics in 61%, statins in 75%, thrombolytic in 14%, ACE inhibitors in 72%, antiplatelet in 87%, anticoagulants in 58%, beta blockers in 43%, and calcium channel blockers in 8%. The difference was significant (P< 0.05).

Conclusion: The authors found that commonly prescribed cardiovascular drugs were antiplatelet, anticoagulants, thrombolytic, ACE inhibitors, beta blockers, diuretics, and statins.

Keywords: anticoagulants, cardiovascular diseases, coronary artery diseases

Introduction

Cardiovascular diseases (CVD) are a group of disorders that affect the heart and blood vessels. They can range from conditions that primarily affect the heart (such as coronary artery disease) to those that primarily affect the blood vessels (such as peripheral artery disease). Globally, CVD is a leading cause of morbidity and mortality.

Cardiovascular diseases are responsible for 1.5 million deaths in India annually. Hypertension is linked to 57% of all stroke deaths and 24% of all coronary event deaths [1]. Hypertension is ranked as the third-most important risk factor for attributable disease burden in South Asia. Hypertension is arguably the single most important risk factor for cardiovascular, cerebrovascular, and renal disease and can be modified by timely detection as well as decisive therapeutic intervention [2].

Coronary artery disease (CAD) is the primary risk factor for heart disease. It occurs when the blood vessels that supply blood to the heart (coronary arteries) become narrowed or blocked due to the accumulation of cholesterol and other materials, leading to reduced blood flow to the heart muscle. This can result in chest pain (angina), heart attacks (myocardial infarctions), and other complications [3]. Hypertension occurs when the force of blood against the walls of the arteries is consistently too

high. Over time, this can lead to damage to the arteries and organs, including the heart, brain, and kidneys. Drug utilisation research facilitates the identification of clinical drug utilisation and its impact on the health care system [4]. Defined daily dose (DDD) is one such measurement that identifies clinical drug use and is defined as "the assumed average maintenance dose per day for a drug used for its main indication in adults [5].

Aims and Objectives

The present study was conducted to assess drug utilization in patients with cardiovascular diseases.

Material & Methods

A prospective observational study consisted of 102 patients of both genders attaining out-patient departments (OPD) or emergency care at the Department of Medicine in collaboration with the Department of Pharmacology at Sri Krishna Medical College & Hospital, Muzaffarpur, Bihar, India, for a period of 2 years (May 2018–April 2020). The institutional ethical committee gave its clearance before the study could be conducted. To participate in the research project, each participant had to complete a written consent form. For a 2-year period, the drug use in 102 medical records in total was analysed. The anatomical-therapeutic-chemical classification of drugs was used to classify the prescription pattern, which was assessed using the WHO prescribing indicators and DDD.

Data such as name, age, gender, etc. was recorded. Recorded parameters include the typical number of drugs prescribed per prescription, the percentage of drugs prescribed using their generic names, the percentage of prescriptions containing antibiotics, the percentage of prescriptions containing injections, and the percentage of drugs prescribed from the essential drug list. The data thus obtained were subjected to statistical analysis using SPSS software version 22 and Microsoft version 16.P values less than 0.05 were taken as significant.

Results

Out of the total 102 patients records were analysed, 61 (59.80%) were male and 41 (40.20%) were female. The male-to-female ratio was found to be 1.49.The mean age of male were 54.91 ± 16.37 years and females were 55.46 ± 16.10 years respectively(Table1,Figure1).

Table 1: Gender wise distribution of patients

Gender	No. of patients	Percentage
Male	61	59.80
Female	41	40.20
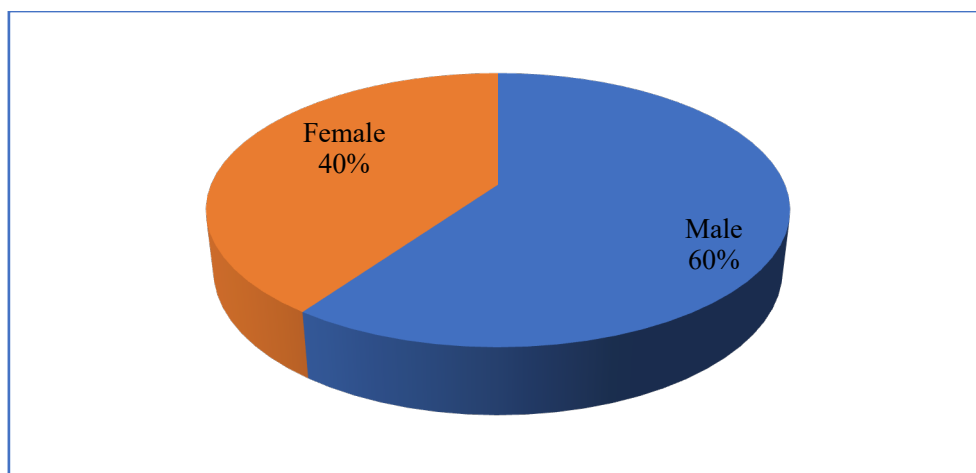
Figure 1: Gender wise distribution

Table 2: Pattern of prescription writing

Prescribing indicators	Percentage
Average number of drugs prescribed per prescription (≤3)	15%
Percentage of drugs prescribed by generic name (100%)	23%
Percentage of prescriptions with an antibiotic prescribed (≤30%)	35%
Percentage of prescriptions with an injection prescribed (≤10%)	96%
Percentage of drugs prescribed from the national EDL (100%)	98%

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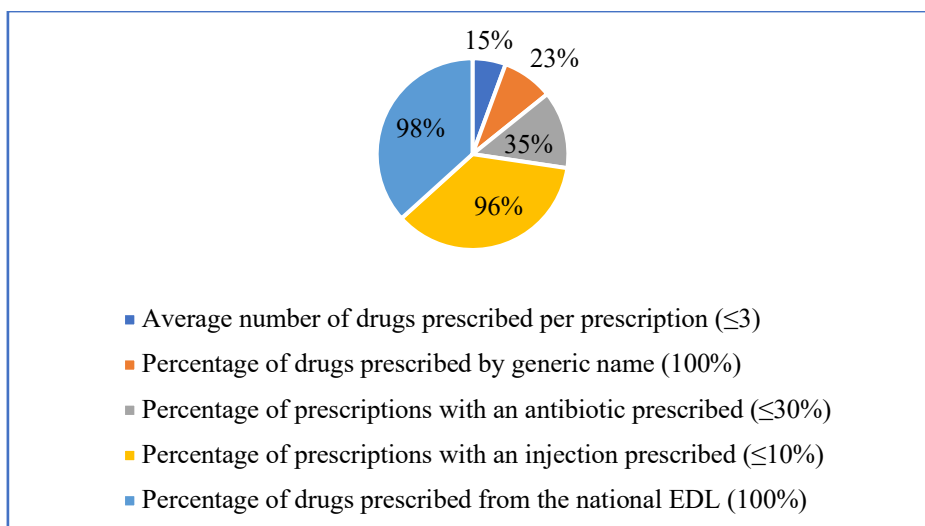
Figure 2: Percentage wise pattern of prescription writing

Table 2 and Figure 2, shows that average number of drugs prescribed per prescription (≤3) was seen in 15%, percentage of drugs prescribed by generic name (100%) in 23%, percentage of prescriptions with an antibiotic prescribed (≤30%) in 35%, percentage of prescriptions with an injection prescribed (≤10%) in 96% and percentage of drugs prescribed from the national EDL (100%) in 98%.

Table 3: Type of cardiovascular drugs prescribed

Cardiovascular drugs	Percentage	P value
Diuretics	61%	0.04
Statin	75%	
Thrombolytics	14%	
ACE inhibitors	72%	
Antiplatelets	87%	
Anticoagulants	58%	
Beta blockers	43%	
Calcium channel blockers	8%	

Table 3 and Figure 3, shows that cardiovascular drugs prescribed were diuretics in 61%, statins in 75%, thrombolytic in 14%, ACE inhibitors in 72%, antiplatelet in 87%, anticoagulants in 58%, beta blockers in 43%, and calcium channel blockers in 8%. The difference was significant ($P < 0.05$).

- Diuretics
- Statin
- Thrombolytics
- ACE inhibitors
- Antiplatelets
- Anticoagulants
- Beta blockers
- Calcium channel blockers
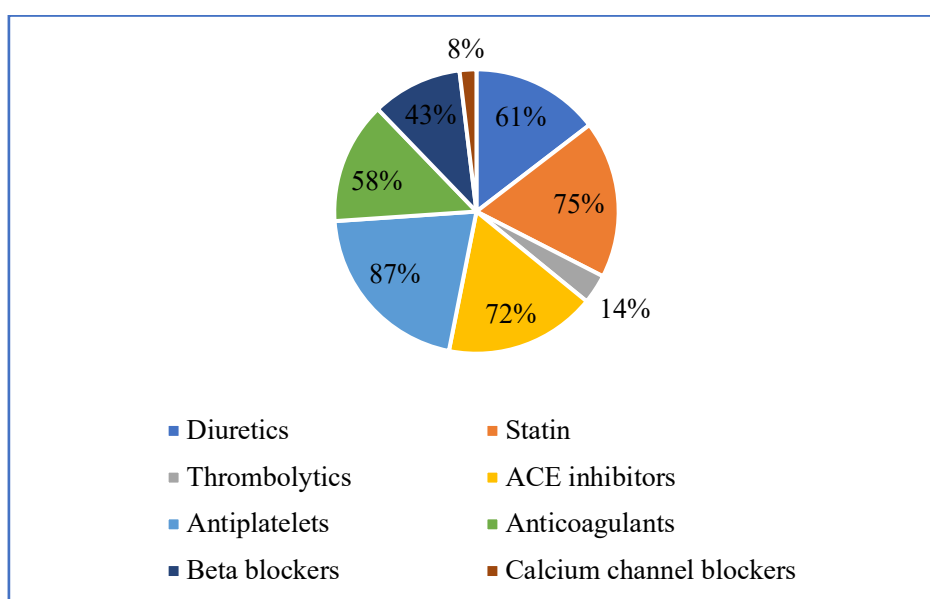
Figure 3: Percentage wise different type of cardiovascular drugs prescribed

Discussion

In India, 26% of deaths from non-communicable diseases (NCDs) are attributable to cardiovascular disease (CVD).[6] Despite having highly advanced medical facilities, CVDs have a lower quality of life and a higher mortality rate than other NCDs [7]. Acute coronary syndrome (ACS) patients in India experience a higher rate of ST-elevation myocardial infarction (STEMI) than patients in industrialised nations. This is because the treatment choices available to rich and poor patients are different, which has a substantial impact on mortality and morbidity [8]. Despite the fact that women have CVD at an earlier age and with more concomitant conditions than men, treatment and outcome were comparable after controlling for relevant confounders [9]. Risk factors for cardiovascular diseases include an unhealthy diet, a lack of physical activity, smoking, excessive alcohol consumption, obesity, diabetes, and genetics. Prevention and management involve lifestyle changes (healthy diet, regular exercise, smoking cessation), medications, and medical procedures (stents, bypass surgery, pacemakers, etc.) [10]. The present study was conducted to assess drug utilisation in cardiovascular disease.

We found that the average number of drugs prescribed per prescription (≤3) was seen in 15%, the percentage of drugs prescribed by generic name (100%) in 23%, the percentage of prescriptions with an antibiotic prescribed (≤30%) in 35%, the percentage of prescriptions with an injection prescribed (≤10%) in 96%, and the percentage of drugs prescribed from the national EDL (100%) in 98%.

Naliganti et al. [11], found that 58.57% were male and 41.43% were female, and coronary artery disease was the most common cause of admission, followed by cardiomyopathy.

The percentage of drugs with generic names was least represented among prescribing indicators, with 26.86% and 18.95% during hospitalisation and discharge, respectively. A mean of 11.55 (hospitalisation) and 6.55 (discharge) drugs were prescribed per prescription. Antiplatelet (72.86%) and statin (80.62%) use predominated during complete therapy. Furosemide was shown to have a high DDD (109.33), which was followed by atorvastatin (64.6), enalapril (58.44), aspirin (58.14), and clopidogrel (53.2).

We observed that cardiovascular drugs prescribed were diuretics in 61%, statins in 75%, thrombolytic in 14%, ACE inhibitors in 72%, antiplatelet in 87%, anticoagulants in 58%, beta blockers in 43%, and calcium channel blockers in 8%.

Kolwalkaret al. [12], found that the average number of drugs prescribed per person was 4.95. The top three drugs most commonly prescribed were antiplatelet (21.46%), beta-blockers (14.76%), and statins (13.78%). Most drugs were prescribed as single drugs (90.98%), whereas 9.02% were fixed-dose drug combinations (FDC). The combination of aspirin and clopidogrel was the most commonly prescribed FDC. The majority (72.44%) of the drugs prescribed were as per the NLEM 2015 list, whereas the generic name was low (2.8%). The average consultation time and dispensing time were 7.76 and 3.23 minutes, respectively. The in-house pharmacy dispensed 82% of the drugs. 93.75% of the key drugs were available in the facility. A copy of the essential drug list was readily available in the facility. 96.67% of the patients knew the correct dosage of drugs.

Kulkarniet al. [13], found that in their study, a total of 359 prescriptions were studied. Out of 359 patients, 131 (36.49%) were female and 228 (63.51%) were male.The mean age of the patients admitted to the ICCU was 55.68 ± 13.54 years. Acute myocardial infarction (77.16%), ischemic heart disease (8.36%), cardiogenic shock (4.18%), left bundle branch block (3.62%), rheumatic heart disease (2.79%), and supraventricular tachycardia (2.23%) are the most common diagnoses for patients hospitalised in the intensive care unit (ICCU).The most common drugs prescribed in ICCU were aspirin, clopidogrel, and atorvastatin. Other drugs most commonly used are metoprolol (95.82%), ramipril (92.48%), isosorbitedinitrate (86.07%), and ranitidine (83.29%).

The most commonly recommended drugs included antiplatelet, statins, ACE inhibitors, and diuretics, all of which improved the treatment's outcomes. In previous studies, almost all patients received antiplatelets [14]. The treatment of pulmonary embolism, venous thrombosis, and unstable angina with enoxaparin was found to be successful [15], and the use of anticoagulants was optimal compared to previous Indian studies (75%–85%) [16].The study found that tenecteplase, which was recently added to the prescription formulary, proved more advantageous than streptokinase. Only the drug atorvastatin was used for lowering triglycerides. The use of statins and ACE inhibitors was appropriate and consistent with other studies [14].

A rough estimation of the number of drugs used per 100 beds per day is given by the DDD concept. Without considering dosage adjustments or patient-specific conditions, it was assumed that each patient who was prescribed certain drugs would take a specific DDD every day. It was shown that furosemide's DDD was noticeably higher than those of the others; as a result, it must be used cautiously to avoid nutrient deficiencies and fluid loss.

It is strongly advised that generic names be used in prescriptions to promote better information

exchange and improved interaction between healthcare professionals [17].

This is a major concern because there are a very low percentage of drugs prescribed under generic names. In the study, it was found that injectable and antibiotics were used properly. The chance of increasing the risk of blood-borne infections increases as the number of injections given to inpatients increases. Despite the availability of oral dosages while the patient is in the hospital, the improper usage or abuse of antibiotics is a global concern, so whether to use injectable or not depends on the condition of the patient [18].

Limitations of study

Small sample size and duration of study period was short.

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Conclusion

Authors found that commonly cardiovascular drugs prescribed were antiplatelets, anticoagulants, thrombolytics, ACE inhibitors, beta blockers, diuretics and statin.

Acknowledgment

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