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Research Article

A Prospective Observational Study on the Prescribing Trends of Cardiovascular Drugs

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Background: Cardiovascular diseases (CVDs) are a more frequent morbidity and mortality in India; the case ratio is gradually rising due to lifestyle and socio-economic changes. issues such as long-term treatment, high costs, polypharmacy, and irrational prescribing, creating awful therapeutic outcomes. **Aim:** To assess the prescribing trends and utilisation patterns of cardiovascular drugs in a tertiary care hospital. **Methodology:** A prospective observational study was conducted in the cardiology department of a tertiary care hospital from January to April 2026. A total of 150 patients were diagnosed with CVDs. Data on demographic characteristics, clinical diagnoses, comorbidities, prescribed cardiovascular medications, drug–drug interactions, and adverse drug reactions (ADRs) were collected and analysed graphically. **Results:** Among the study population, 79% were male and 21% were female, with the majority aged between 55 and 65 years. Coronary artery disease (64%) was the most common diagnosis, followed by myocardial infarction (25%). Hypertension (29.5%) and diabetes mellitus (24.3%) were the most frequently observed comorbidities. Antiplatelet agents were the most commonly prescribed drugs (82.6%), followed by anticoagulants (48.6%) and thrombolytics (6.6%). Aspirin (47.2%) and clopidogrel (41.6%) were the predominant antiplatelets, while unfractionated heparin (40%) was the most frequently used anticoagulant. Streptokinase was the preferred thrombolytic agent. Drug–drug interactions were identified in 90.2% of prescriptions, and 25 ADRs were reported. **Conclusion:** The study reveals extensive use of antiplatelets and anticoagulants in cardiovascular therapy. However, the high prevalence of polypharmacy and drug interactions highlights the need for rational prescribing, close monitoring, and patient education to improve treatment safety and outcomes.

Keywords: Cardiovascular diseases, Prescribing patterns, Cardiovascular drugs, Rational drug use, Patient compliance, Poly Pharmacy.

INTRODUCTION

Cardiovascular diseases (CVDs) are highly impactful in morbidity and mortality in India. 1. As per WHO reports, an estimated 16.7 million people died from cardiovascular diseases in 2024.2 Cardiovascular diseases are a group of disorders of the heart and blood vessels, which include coronary artery disease, cerebrovascular disease, peripheral artery disease, congenital heart disease, rheumatic heart disease, deep vein thrombosis and pulmonary embolism. Cardiovascular disease is mainly caused by high blood pressure, smoking, diabetes, lack of exercise, obesity, poor diet, high blood cholesterol and excessive alcohol consumption. Coronary artery disease is mainly caused by the atherosclerotic changes in the inner walls of the blood vessels that supply blood to the heart. The atherosclerotic process leads to the buildup of fatty deposits, plaque formation, and thickening of vessel walls. These changes gradually lead to narrowing of the lumen, which restricts blood flow to the myocardium.3 Decreased blood flow to the heart causes ischemia, which leads to chest pain and cardiac dysfunction.

Coronary artery disease is associated with increased risk of myocardial Infarction (MI) and stroke.4 Myocardial infarction occurs due to an imbalance between myocardial blood supply and demand. An imbalance between myocardial oxygen supply and demand leads to myocardial infarction (MI). Plaque formation resulting from coronary artery disease causes flow-limiting stenosis, which ultimately leads to myocardial necrosis. Inadequate perfusion of the left ventricular myocardium due to necrosis contributes to progressive ventricular dilation, development of mitral regurgitation, and eventual cardiac failure. A spectrum of thrombotic coronary artery diseases, including unstable angina, ST-segment elevation myocardial infarction (STEMI), and non–ST-segment elevation myocardial infarction (NSTEMI), together constitute acute coronary syndrome (ACS). The management of cardiovascular disease focuses on symptoms and reducing the risk of recurrent events. Both pharmacological and non-pharmacological interventions are essential in treatment. Commonly prescribed pharmacological agents for angina and coronary artery disease include antiplatelet agents, anticoagulants, beta-blockers, angiotensin-converting enzyme (ACE) inhibitors, nitrates, statins, and calcium channel blockers (CCBs). In addition to pharmacotherapy, surgical revascularization techniques—such as percutaneous transluminal coronary angioplasty (PTCA) and coronary artery bypass grafting (CABG)—play a significant role in curing and improving patient progress. The primary therapeutic goal in myocardial infarction is to restore coronary perfusion and limit myocardial necrosis. Definitive management strategies differ between STEMI and NSTEMI. In STEMI, timely reperfusion is essential, with early percutaneous coronary intervention (PCI) recommended for patients presenting within 12 hours of symptom onset. For those unable to undergo PCI within the recommended time frame, fibrinolysis is the preferred option. Adjunctive therapy with antiplatelets and anticoagulants is routinely used to enhance reperfusion outcomes. In contrast, NSTEMI is managed with antiplatelets, anticoagulants, and other supportive measures, whereas fibrinolysis is contraindicated. The concept of Rational Use of Medicines (RUM) is defined as: “Patients receive medications appropriate to their clinical needs, in doses that meet their individual requirements, for an adequate duration, and at the lowest cost to them and their community.” Medicines are indispensable in modern healthcare and serve as essential tools in combating disease. The quality of medical care depends on judicious, safe, effective, and cost-conscious prescribing. Inappropriate prescribing can result in ineffective or unsafe treatment, prolonged illness, patient distress, and unnecessary economic burden. Cardiovascular diseases, in particular, impose a substantial medical and economic burden. Understanding prescribing patterns is an important step toward promoting rational drug use and improving prescribing practices. Identifying and assessing these patterns not only enhances the quality of pharmacotherapy but also strengthens patient safety. Since cardiovascular diseases often require combination therapy involving multiple essential drugs, the risk of drug–drug interactions is considerable. Although none of these therapies can be omitted, interactions can be managed effectively through dose adjustments, proper timing of administration, and regular monitoring of relevant laboratory parameters to detect and mitigate adverse drug reactions. In light of these considerations, the present study was undertaken to evaluate the prescribing patterns of drugs in patients with cardiovascular diseases.

MATERIALS AND METHODS

Study location and duration:

This prospective observational study was conducted in the Department of Cardiology of a 1000-bedded multi-speciality hospital over a period of three months, from January 2026 – April 2026.

Data collection: Eligible patients were enrolled based on the inclusion criteria. Relevant information was obtained from patient case records and documented in a structured proforma. Data collected included demographic details, co-morbid conditions, cardiology investigation findings, prescribed drug regimens (dose and frequency), potential drug interactions, and adverse drug reactions.

Inclusion criteria:

Patients aged above 18 years diagnosed with coronary artery disease, myocardial infarction, or acute coronary syndrome were included in the study.

Exclusion criteria:

Patients below 18 years of age and pregnant women were excluded from participation.

RESULT:

This study provides an overview of cardiovascular drug prescribing patterns. A total of 150 patients were evaluated. As shown in Figure 1, 79% of the patients were male and 21% were female, with a male-to-female ratio of 5:1. The incidence of cardiovascular disease was found to be higher in males compared to females. Age-wise distribution revealed that cardiovascular diseases were most prevalent in the 55–65 year age group. Among the study population, the most common cardiovascular condition was coronary artery disease (64%), followed by myocardial infarction (25%). Several co-morbid conditions such as diabetes mellitus, hypertension, hypothyroidism, and hyperlipidemia were observed, many of which also served as important risk factors for cardiovascular disease. Hypertension (31.8%) and diabetes mellitus (26.28%) were the most common co-morbidities identified in the study population, both of which are significant risk factors for cardiovascular disease (Table 1). Smoking was also found to be a major contributing factor, reported in 46% of patients. The management of cardiovascular diseases in the study population involved multiple categories of drugs, including antiplatelet agents, anticoagulants, fibrinolytics, antianginals, antihypertensives, and antihyperlipidemic agents, along with supportive therapies (Table 2). Among the total cases, 45% were managed exclusively with medical therapy, while surgical interventions such as percutaneous transluminal coronary angioplasty (PTCA) and coronary artery bypass grafting (CABG) were performed in 17% and 34% of patients, respectively. Antiplatelet agents such as aspirin and clopidogrel were the most widely prescribed medications, being essential in reducing thrombotic events and improving survival outcomes. Among the prescriptions, 46.03% of patients received aspirin, 43.4% received clopidogrel, 7.01% were on combination therapy with aspirin and clopidogrel, 6.04% received ticagrelor, and 1.6% received prasugrel (Table 3). Anticoagulant therapy included heparin, which was prescribed to 41.9% of patients, followed by dalteparin (27.3%) (Table 4). Among thrombolytics, streptokinase was the most frequently prescribed (5 patients), followed by Reteplase (2 patients) and Aiteplase (1 patient). Importantly, out of 150 cases, 115 (76.6%) were found to have drug–drug interactions, highlighting the complexity of cardiovascular pharmacotherapy to be major is 59% and moderate 41% as depicted in Figure 2. Among the total cases, 29 adverse drug reactions were found.

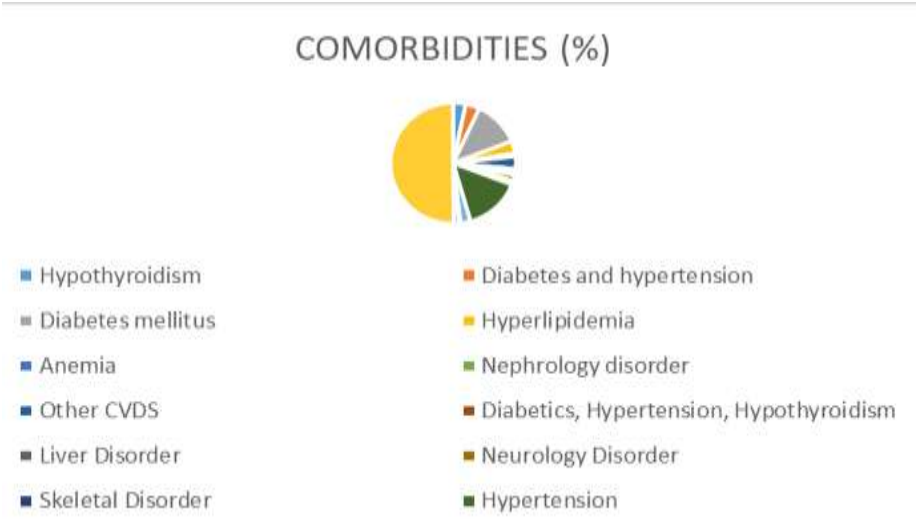

Fig.1: Distribution of patients based on comorbidities.

Table 1: Different Categories of Drugs Prescribed To The Patients.

Drug categories	No. of patients	Percentage (%)
Anticoagulants	73	48.6
Antiplatelets	124	82.6
Thrombolytics	10	6.6

Table 2: Antiplatelets drugs prescribed to the patients.

Antiplatelets	No. of cases	Percentage (%)
Clopidogrel	75	41.6
Ticlopidine	7	3.8
Ticagrelor	12	6.6
Aspirin	85	47.2
Abciximab	1	0.5
Total	180	100

Table 3: Anticoagulant drugs prescribed to the patients

Anticoagulants	No. of cases	Percentage (%)
Warfrin	10	14.2
Enoxaparin	18	25.7
Unfractioned heparin	28	40
Apixaban	8	11.4
Dabigatran	5	7.1
Fragmin	1	1.4
Total	70	100

Tablet 4: Thrombolytic drugs prescribed to the patients.

Thrombolytics	No. of cases	Percentage (%)
Streptokinase	5	62.5
Reteplase	2	25
Aiteplase	1	12.5
Total	8	100

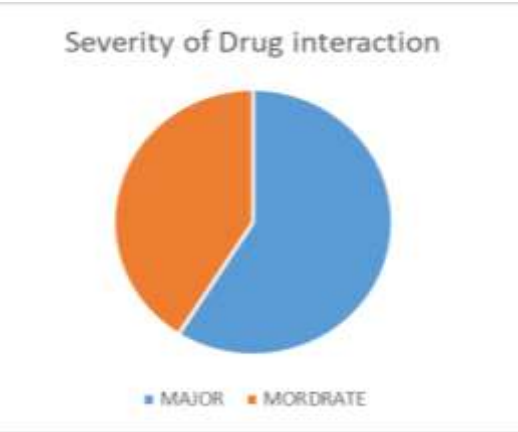

Fig.no.2: Severity of Drug Interaction

DISCUSSION:

Cardiovascular diseases (CVDs) remain one of the leading causes of death in India. Factors such as changing dietary habits, sedentary lifestyles, and

rapid urbanisation have significantly contributed to this burden. Men are more commonly affected than women, with the prevalence showing a marked increase over time. The risk of CVDs rises cumulatively with age. In the present study, CVDs were observed more frequently in males (66%) and in individuals above 40 years of age (Figure 1). A similar trend was reported in studies conducted by Shabnam Narayanan et al. and Deepa Shokeen et al. CVDs are largely triggered by risk factors such as hypertension, high cholesterol, obesity, and diabetes. These factors, however, can be mitigated through lifestyle modifications, including a healthy diet, regular physical activity, and tobacco avoidance. In this study, hypertension and diabetes emerged as the most common co-morbid conditions associated with coronary artery disease. This finding is consistent with the study by Battu Rakesh et al., which also identified hypertension and diabetes mellitus as the predominant risk factors for cardiovascular disorders. Aspirin was the most frequently prescribed antiplatelet agent, aligning with the results of a study conducted by Pranay Wal et al. Aspirin and clopidogrel were the most frequently prescribed antiplatelet drugs for the therapeutic management of cardiovascular disease. In a study conducted by Shruthi Dawalji et al., the prescribing rate of unfractionated heparin was higher compared to low molecular weight heparin. The present study demonstrated a similar trend, with unfractionated heparin prescribed in 40% of cases, while among low molecular weight heparins, dalteparin was most commonly used. The prescribing pattern of nitrates was comparable to the findings of Rajkumar Venisetty et al. For antihypertensives, diuretics (45%) were the preferred choice, a result in line with the study by Supratim Datta et al. Streptokinase was identified as the most commonly used fibrinolytic in the management of STEMI, which concurs with the observations made by Rohan P. Christian et al. The management of cardiovascular disease often requires complex therapeutic regimens, making drug–drug interactions a significant concern. In this study, drug interactions were analyzed using the Medscape drug interaction checker. Out of 150 cases, 115 drug interactions were identified, with 59% classified as major and 41% as moderate. The most effective strategy to prevent adverse drug reactions (ADRs) is timely monitoring through regular patient assessments and laboratory investigations.

Limitations:

This study was limited by its small sample size and single-center design. Therefore, larger multicenter studies are recommended to provide more comprehensive outcomes.

CONCLUSION:

In today's rapidly evolving world, there is a noticeable rise in health risks, with cardiovascular diseases showing a significant upward trend. Advancing age, sedentary lifestyles, irregular habits, increased stress and workload, along with factors such as smoking, collectively contribute to higher morbidity and mortality associated with cardiovascular disorders. In the present study, the prescribing patterns of drugs for cardiovascular conditions were evaluated. Given that the management of CVDs often requires multiple therapies, drug–drug interactions remain a major challenge. Out of 150 cases analyzed, 115 drug interactions were identified. To enhance patient compliance and improve therapeutic outcomes, effective strategies such as regular monitoring and timely intervention are essential.

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