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Research Article

PRESCRIPTION PATTERN OF DRUGS USED IN INPATIENTS WITH CARDIOVASCULAR DISEASES AT A SECONDARY CARE HOSPITAL IN DHARMAPURI DISTRICT: A RETROSPECTIVE STUDY

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Abstract:

Background: Cardiovascular diseases (CVDs) remain the leading cause of global morbidity and mortality. Periodic evaluation of prescribing patterns is essential to optimize rational drug use, minimize adverse drug reactions, and reduce the financial burden on patients. **Objective:** To analyze clinical demographics, disease prevalence, comorbidities, and prescription patterns of cardiovascular drugs among inpatients in a secondary care hospital in Dharmapuri, Tamil Nadu. **Methodology:** A retrospective observational study was conducted over a six-month period (January 2026 to June 2026) in the inpatient department of cardiology. Case sheets of 102 patients meeting the inclusion criteria were analyzed. Statistical analysis was carried out using SPSS. **Results:** Out of 102 patients, 71.6% were male and 28.4% were female. The most prevalent age group was 40–49 years (45.1%). Diabetes mellitus (30.4%) was the most common comorbidity, followed by renal disorders (18.6%) and hypertension/COPD (17.6% each). The most common primary cardiac diagnosis was hypertension (18.6%), followed closely by coronary artery disease (16.6%) and ischemic heart disease (13.72%). Calcium channel blockers (88.24%), diuretics (86.27%), and anti-anginal drugs (79.41%) were the highly prescribed drug classes. Amlodipine (80.30%) and Furosemide (51.90%) were the most frequently utilized individual medications. **Conclusion:** The prescribing patterns in the hospital largely aligned with current therapeutic guidelines. However, a noticeable underutilization of angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs) in diabetic and hypertensive patients represents an area for potential optimization.

Keywords: Cardiovascular diseases, Drug utilization evaluation (DUE), Rational drug use, Comorbidities, Secondary care hospital.

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Introduction:

Cardiovascular disease (CVD) is a major global health issue and the primary source of morbidity and mortality [2, 17]. According to the World Health Organization (WHO), CVDs are the leading cause of death worldwide [12]. In 2008, an estimated 17.5 million people died from CVDs, accounting for approximately 30% of all global deaths [12, 20]. Over 80% of these deaths take place in low- and middle-income countries [1, 13, 22]. By the end of 2020, India was predicted to become the heart disease capital of the world, with an estimated 111% increase in CVD deaths. Mortality rates from CVD in India (272 per 100,000 population) are significantly higher than the global average of 235 per 100,000 [21]. The onset of CAD in developing nations occurs nearly a decade earlier than in Western countries [13, 22]. While the average age of death from coronary artery disease (CAD) in the developed world is approximately 80 years, it drops to 68 years in developing countries [22]. Modifiable risk factors such as elevated blood cholesterol, excessive consumption of alcohol, hypertension, smoking, diabetes, obesity, and physical inactivity play a significant role in triggering these conditions [18, 19]. Additionally, unhealthy diets, excessive sodium, and high intake of trans-fats heavily contribute to cardiovascular risks [14, 15, 16]. Non-modifiable factors such as age, male gender, family history, and genetic predisposition further elevate risk profiles [22]. Pharmacological management of CVD relies on several key drug classes, including beta-blockers, calcium channel blockers (CCBs), angiotensin-converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs), diuretics, lipid-lowering agents, antiplatelets, and vasodilators [3, 9]. Population-based trends in medication use have important implications for patient health [9, 23]. Few studies, however, have evaluated the appropriateness of these trends [11]. Drug utilization evaluation (DUE) acts as an essential branch of pharmacoepidemiology, clarifying the scope, character, and determinants of drug exposure [28]. It helps monitor and evaluate prescribing practices to ensure therapies are rational, safe, and cost-effective [24, 25, 30]. Rational drug use minimizes polypharmacy, reduces adverse drug events, and

lowers the financial burden on patients [24, 32]. This retrospective study evaluates the clinical demographics, diagnostic patterns, and pharmacotherapeutic management of cardiac inpatients at a secondary care hospital in Dharmapuri, Tamil Nadu, India.

Methodology;**Study Design & Setting**

This was a retrospective, observational drug utilization study conducted in the inpatient department of cardiology at a secondary care hospital in Dharmapuri, Tamil Nadu, India.

Study Period & Sample Size

The study was conducted over a six-month period from January 2026 to June 2026. A sample of 102 inpatient medical records was selected via random sampling.

Data Sources

Data were extracted from:

- Patient medication profiles
- Physician prescribing records
- Nursing charts and laboratory reports

Selection Criteria

- **Inclusion Criteria:** Inpatients admitted to the cardiology department during the study period, patients aged 18 years and older, and patients presenting with cardiac diseases with or without associated comorbidities.
- **Exclusion Criteria:** Patients admitted to other specialty departments, patients undergoing active surgical interventions, pregnant or lactating women, and patients under 18 years of age.

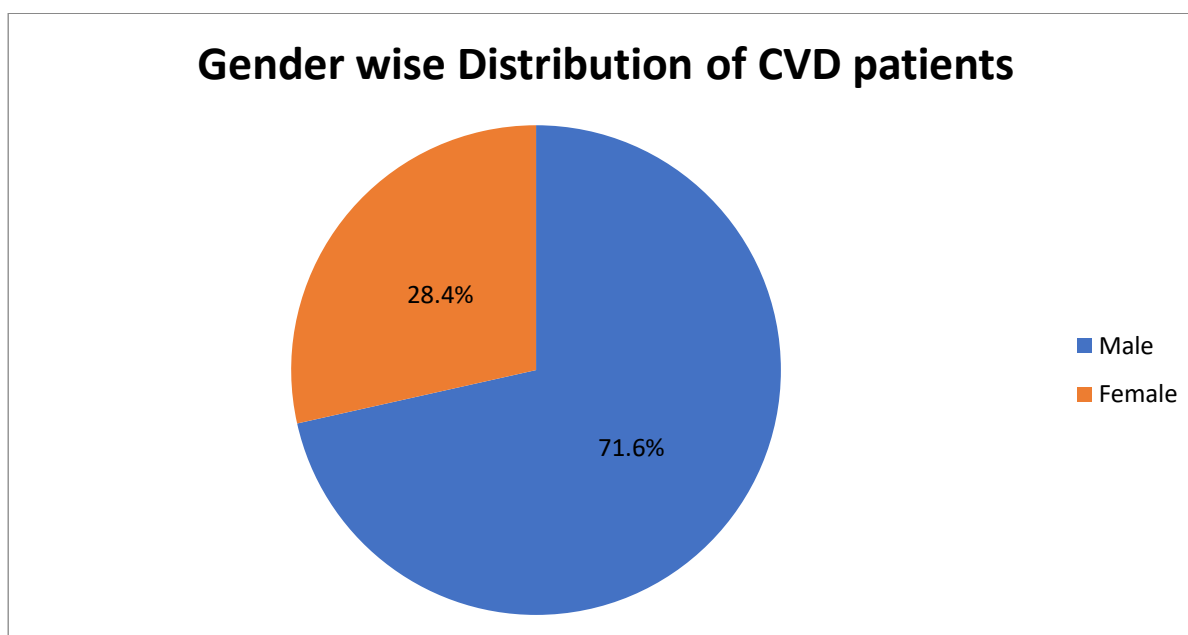
Ethics and Data Analysis

The study was approved by the Institutional Ethical Committee. Demographic details, primary diagnoses, comorbidities, and therapeutic regimens were systematically documented using a standardized proforma. Statistical analysis was performed using SPSS.

Results and Discussion:

Table No: 1 Gender wise distribution of cardiovascular patients (n=102)

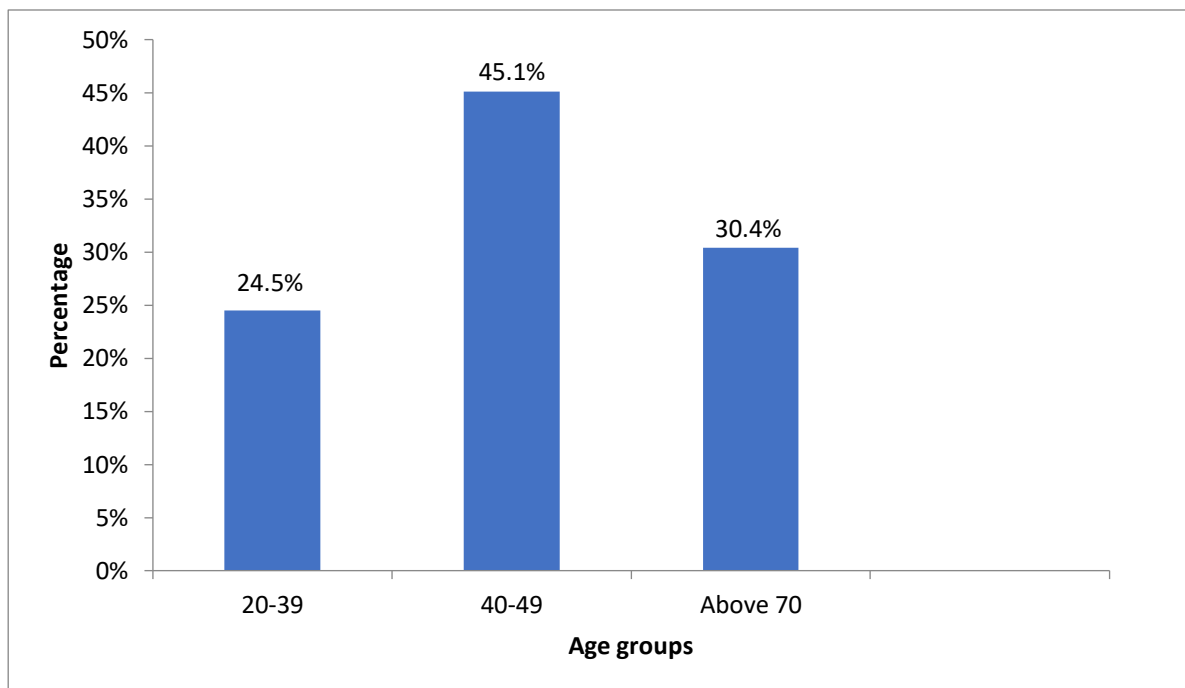
Gender	Number of patients	Percentage (%)
Male	73	71.6%
Female	29	28.4%

Figure 1. Patient demographic (Gender wise distribution of CVD patients)

Out of 102 patients with cardiovascular disease were collected in this present study. 71.6 % male was a high frequency of cardiovascular disease incidence as a compared to 28.4% of female patients. (The results were shown in the Table No: 1 and Fig No: 1)

Table no: 2 Age wise distribution of cardiovascular patients (n=102)

S .no	Age	No of male cases	No of female cases	No. of Patients	Percentage %
1	20-39	24	06	30	24.5%
2	40-49	31	10	41	45.1%
3	Above 70	18	13	31	30.4%

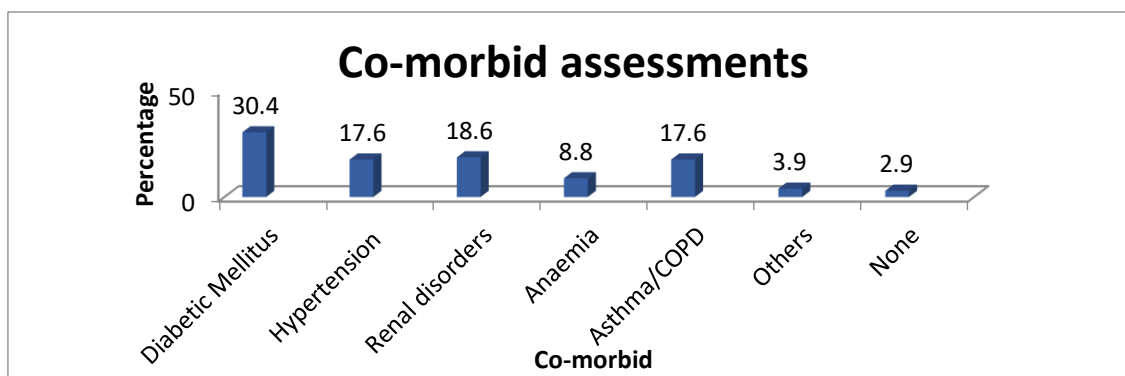
Figure 1: Age wise Distribution among CVD patients

In our study most of the patients diagnosed with CVD's were of the age group of 40-49 (45.1%) years followed by above 70 years (30.4) and 40-49 years (24.5%) age group. (The results were shown in the Table No: 2 and Fig No: 2).

Table 3: Co-morbid Assessment.

Medical condition	Number of patients	Percentage%
Diabetic Mellitus	31	30.4%
Hypertension	18	17.6%
Renal disorders	19	18.6%
Anaemia	9	8.8%
Asthma/COPD	18	17.6%
Others	4	3.9%

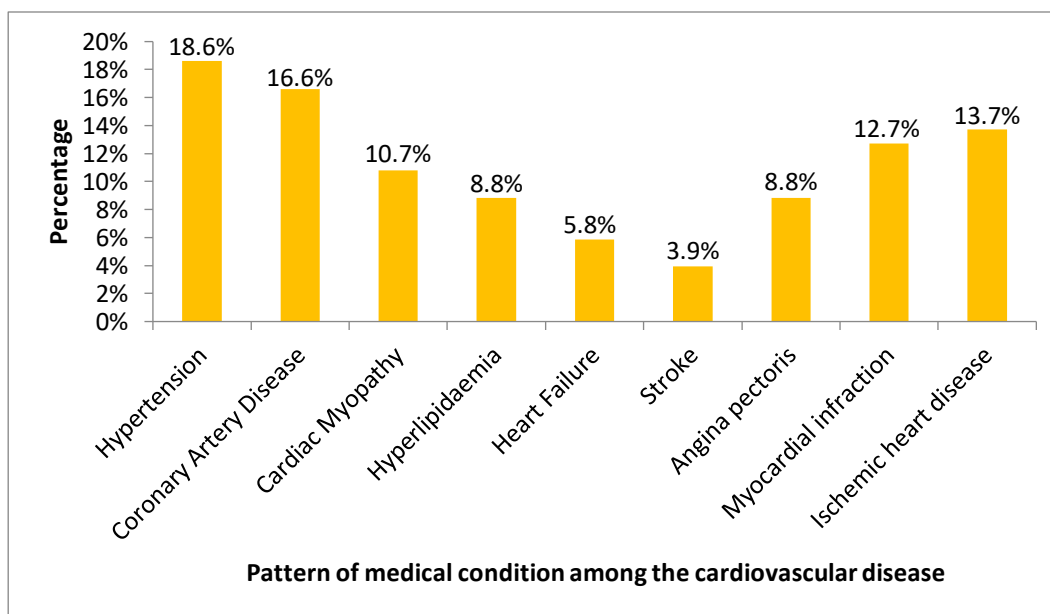
Figure 3: Co-morbid Assessment.



The various co-morbid assessments like Diabetic Mellitus, Hypertension, Renal disorders, Anaemia, Asthma/COPD, Others and none were seen among these patients. In total 102 patients 31 patients with (30.4%), 19 patients with hypertension (17.6%) and 19 patients with renal disorders (18.6%) most common co-morbid found in most of patients which high risk of cardiovascular disease morbidity and mortality.(The results were shown below in the Table No: 3 and Fig No: 3).

Table 4: Pattern of medical condition among the cardiovascular disease

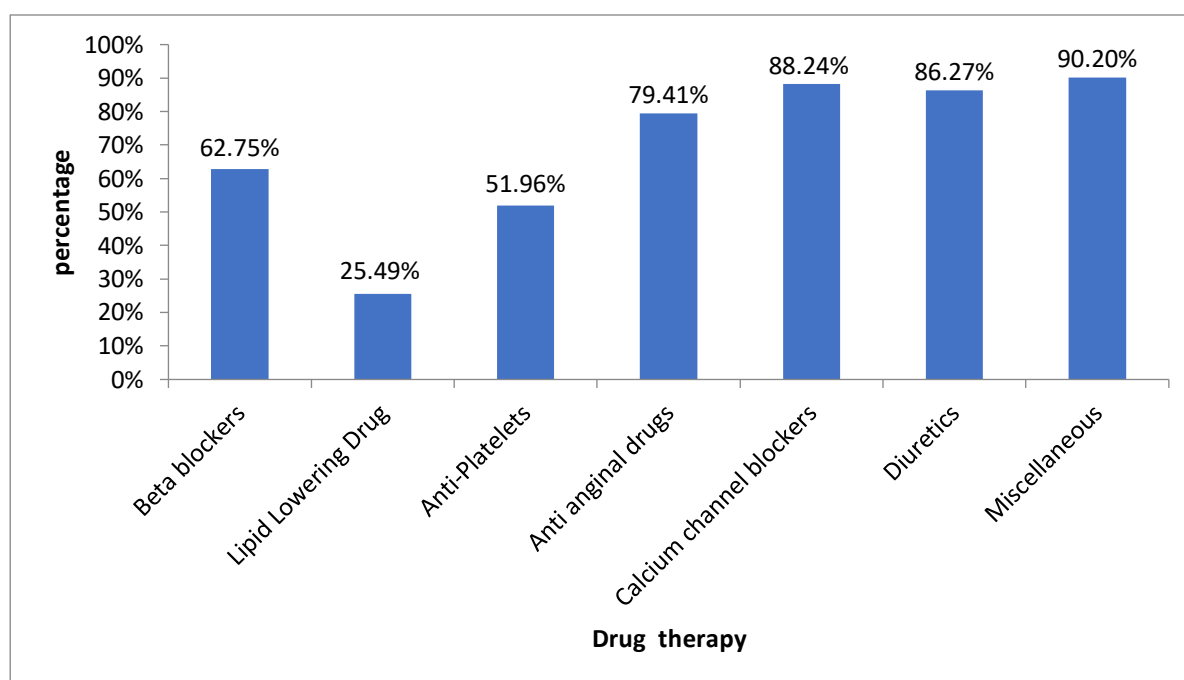
Medical Condition	Number of patients	Percentage (%)
Hypertension	19	18.6%
Coronary Artery Disease	17	16.6%
Cardiac Myopathy	11	10.7%
Hyperlipidaemia	9	8.8%
Heart Failure	6	5.8%
Stroke	4	3.92%
Angina pectoris	9	8.8%
Myocardial infraction	13	12.74%
Ischemic heart disease	14	13.72%

Figure 4: Pattern of medical condition among the cardiovascular disease.

Shows the different types of cardiovascular diseases diagnosed. 18.6% patients were reported with hypertension and 16.6 % patients were diagnosed with Coronary Artery Disease. Followed by other conditions were Myocardial infarction (12.74%), Ischemic heart disease (13.72%), Cardiac Myopathy (10.78%), Hyperlipidaemia (8.82%), Heart Failure (5.88%), Stroke (3.92%), Angina pectoris (8.82%).(The results were shown in the(Table No:4 and Fig No:4).

Table: 5 Drugs prescribed Pattern of different condition among the cardiovascular disease;

Drug Therapy	Number of Patients(n=102)	Percentage (%)
Beta blockers	64	62.7%
Lipid Lowering Drug	26	25.4%
Anti-Platelets	53	51.9%
Anti Anginal Drug	104	79.4%
Calcium channel blocker	90	88.2%
Diuretics	88	86.2%
Miscellaneous	92	90.2%

Figure 5: Drugs prescribed Pattern of different condition among the cardiovascular disease:

Physicians prescribed several and different pharmacological therapeutic classes of drug. These prescribed to the patients in different groups have been categorized. Most of the patients were to take beta blockers (62.75%) followed by lipid lowering agents (25.49%), anti platelets (51.96%), anti anginal (79.41%) calcium channel blockers (88.24%) and diuretics (86.27%) and miscellaneous (90.20%).

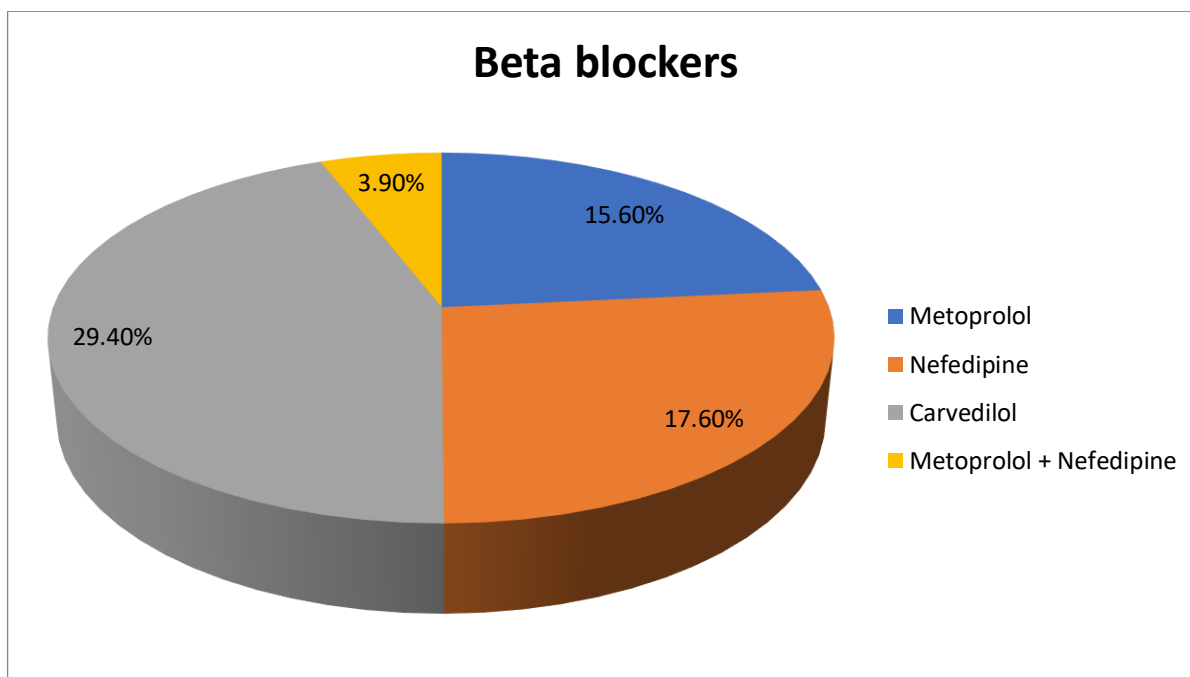
Table 6: Different Category of drugs prescribed to the cardiovascular disease

Category of drugs	Treatment	Number of patients use antihypertensive drug	Percentage (%)
Beta blockers	Metoprolol	16	15.6%
	Nefedipine	18	17.6%
	Carvedilol	30	29.4%
	Metoprolol + Nefedipine	4	3.9%
Lipid Lowering Drug	Atorvastatin	7	6.8%
	Rosuvastatin	17	16.6%
	Fenofibrate	2	1.9%
Anti-Platelets	Clopidogrel	29	28.4%
	Aspirin	9	8.8%
	Aspirin + Clopidogrel	15	14.7%
	Warfarin	19	18.6%

Anti anginal drugs	Isosorbidinitrate	37	36.2%
	Nitroglycerin	21	20.5%
	Ivabradine	26	25.4%
Calcium channel blockers	Amlodipine	82	80.3%
	Diltiazem	5	4.9%
	Verapamil	3	2.9%
Diuretics	Furosemide	53	51.9%
	Mannitol	4	3.9%
	Hydrochlorothiazide	31	30.3%

Table 6.1: Beta blockers:

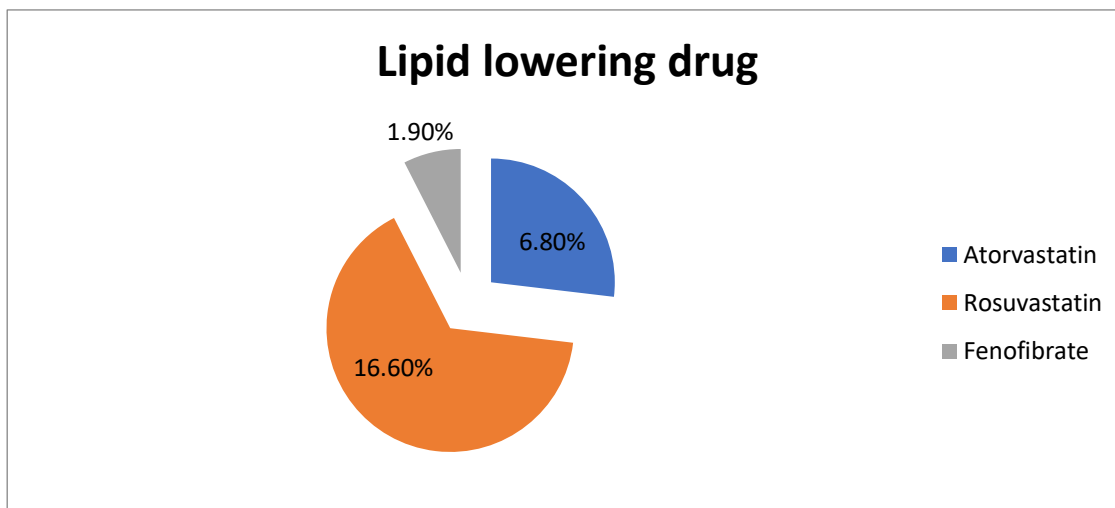
Beta blockers	Metoprolol	16	15.6%
	Nefedipine	18	17.6%
	Carvedilol	30	29.4%
	Metoprolol + Nefedipine	4	3.9%

Figure No 6.1: Beta blockers:

Among newer agents, Metoprolol (15.60%), Nefedipine (17.60%), and Carvedilol (29.40%) of patients respectively. (Table No: 6.1 and Figure No: 6.1)

Table No 6.2: Lipid Lowering Drug:

Lipid Lowering Drug	Atorvastatin	7	6.8%
	Rosuvastatin	17	16.6%
	Fenofibrate	2	1.9%

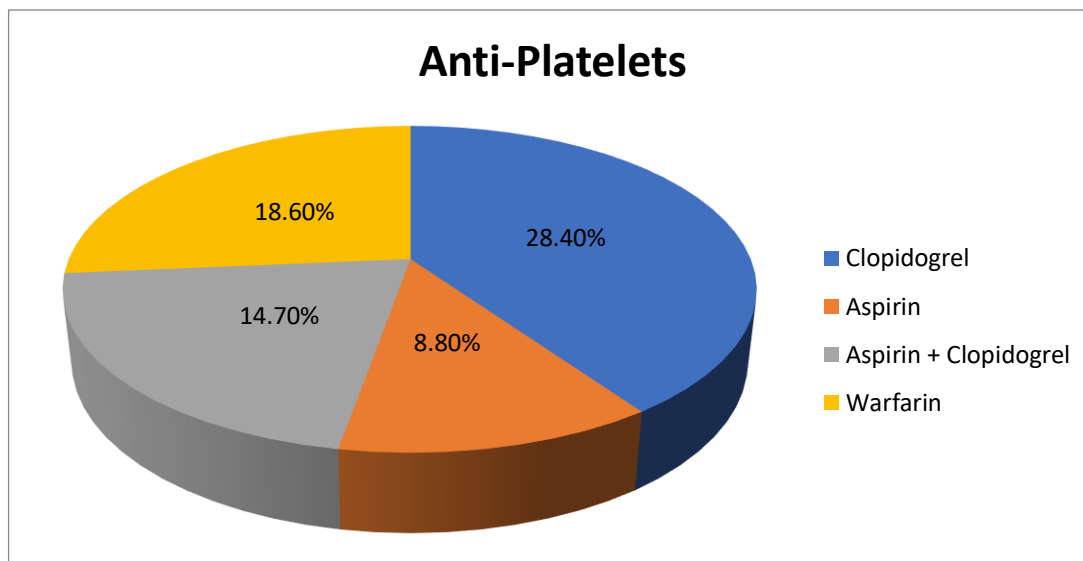
Figure No 6.2: Lipid Lowering Drug:

Among the lipid lowering agents, Atorvastatin was given to the most of the patients (6.80%). Rosuvastatin and Fenofibrate were given to (16.60%) and (1.90%) of patients for reducing Cardiovascular disease. (Table No: 6.2 and Figure No: 6.2)

Table No 6.3. Anti- Platelets.

Anti-Platelets	Clopidogrel	29	28.4%
	Aspirin	9	8.8%
	Aspirin + Clopidogrel	15	14.7%
	Warfarin	19	18.6%

Figure No 6.3. Anti-Platelets.

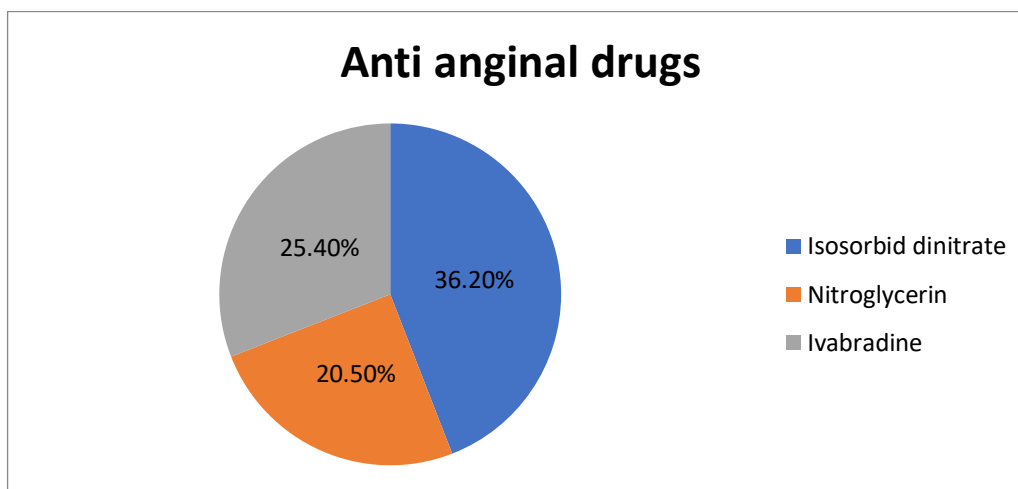


Anti-platelets effect of the both compounds. Clopidogrel (28.40%), Aspirin (8.80%), and Warfarin (18.60%) were prescribed to the patients respectively.(Table No:6.3 and Figure No:6.3)

Table No 6.4 Anti anginal drugs:

Anti anginal drugs	Isosorbid dinitrate	37	36.2%
	Nitroglycerin	21	20.5%
	Ivabradine	26	25.4%

Figure No 6.4 Anti anginal drugs:

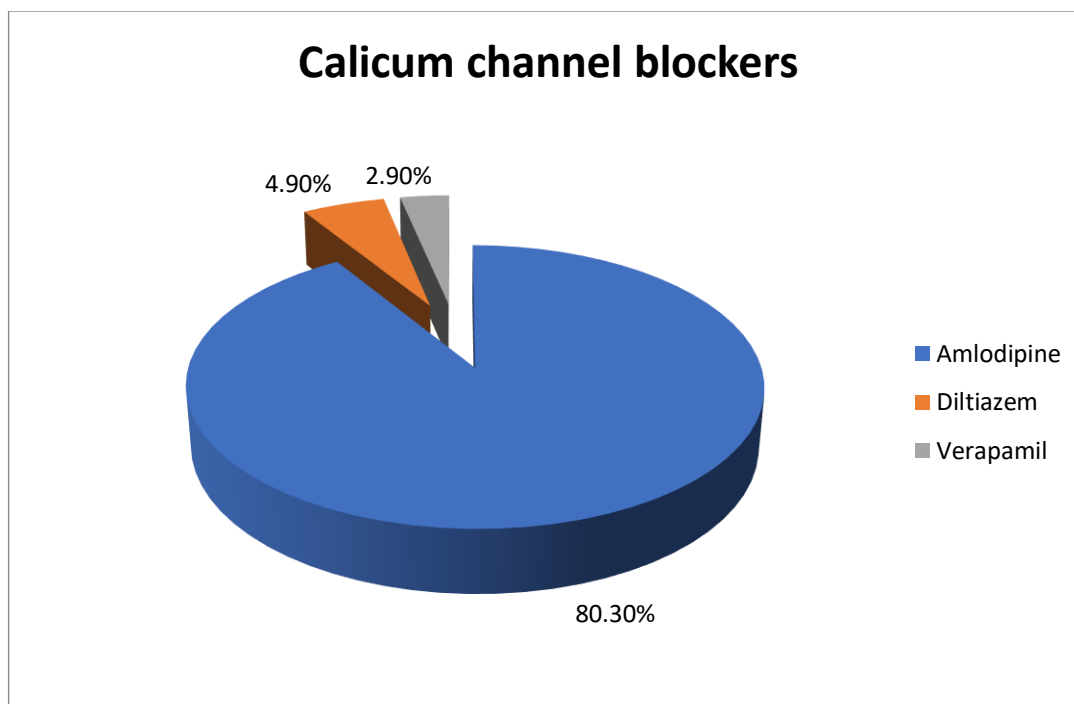


Anti-angina agents such as vasodilators were used commonly. Nitroglycerin was prescribed in (20.50%) of patients whereas isosorbide dinitrate were prescribed in (36.20%) of patients. Ivabradine was prescribed in (25.40%) of patients for those who cannot take beta blockers. (Table No: 6.4 and Figure No: 6.4)

Table No 6.5 Calcium channel blockers:

Calcium channel blockers	Amlodipine	82	80.3%
	Diltiazem	5	4.9%
	Verapamil	3	2.9%

Figure No 6.5 Calcium channel blockers:

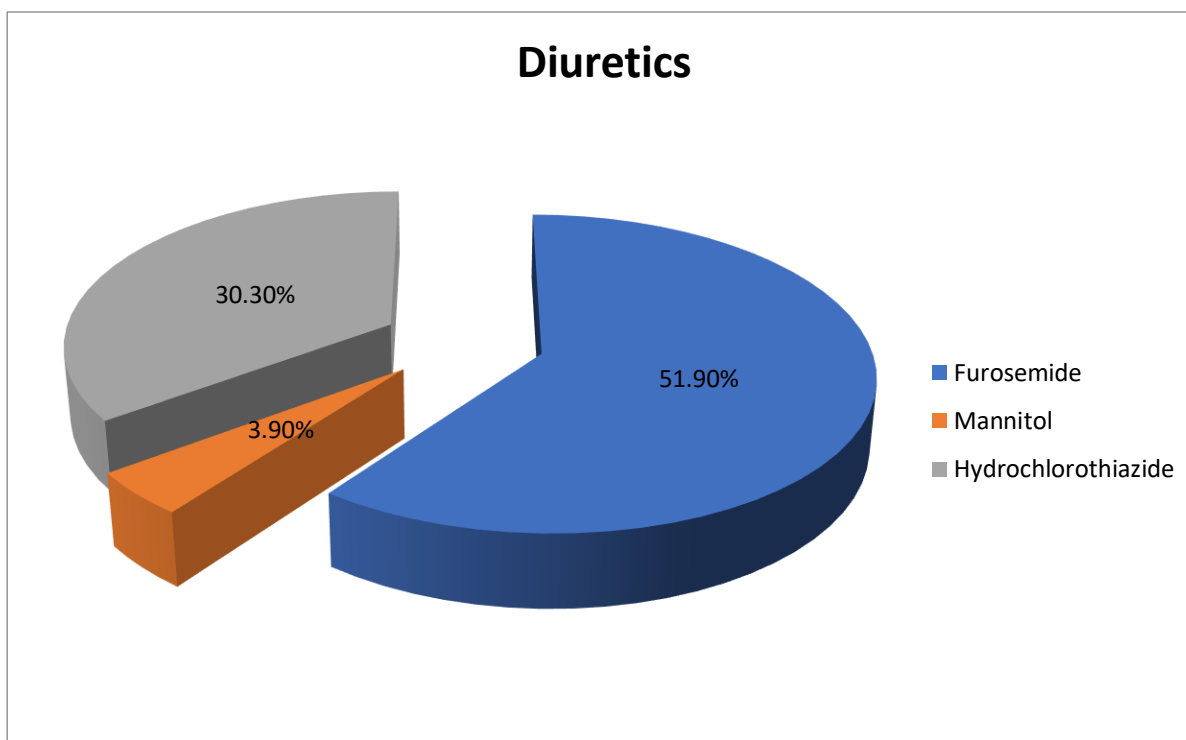


Calcium channel blockers medication used to lower blood pressure and drugs normal used Amlodipine (80.30%), Diltiazem (4.90%) and Verapamil (2.90%) of the patients.

Table No 6.6 Diuretics:

Diuretics	Furosemide	53	51.9%
	Mannitol	4	3.9%
	Hydrochlorothiazide	31	30.3%

Figure No 6.6 Diuretics:



Diuretics were the third preferred option by the physicians, Furosemide (51.90%), Mannitol (3.90%), and Hydrochlorothiazide (30.3%) of the patients respectively.

7. SUMMARY:

- The study was a retrospective observational study conducted in a Secondary Care hospital, Dharmapuri. This study lasted six months, from January 2026 to June 2026. The study analyzed and documented the patient's demographic details, disease prevalence, indications, comorbidities, and the physician's prescribing pattern.
- Patient demographic Out of 102 patients with cardiovascular disease were collected in this present study. 71.6 % male had a high frequency of cardiovascular disease incidence as a compared to 28.4% of female patients. In our study most of the patients diagnosed with CVD's were of the age group of 40-49 (45.1%) years followed by above 70 years (30.4) and 40-49 years (24.5%) age group.(Table 1)
- Co-Morbid Assessments (Table 2) shows the various co-morbid assessments like Diabetic

Mellitus, Hypertension, Renal disorders, Anaemia, Asthma/COPD, Others and none were seen among these patients. In total 102 patients 31 patients with (30.4%), 19 patients with hypertension (17.6%) and 19 patients with renal disorders (18.6%) most common co-morbid found in most of patients which high risk of cardiovascular disease morbidity and mortality.

- Pattern of medical condition among the cardiovascular disease (Table 3) shows the different types of cardiovascular diseases diagnosed. 18.6% patients were reported with hypertension and 16.6 % patients were diagnosed with Coronary Artery Disease. Followed by other conditions were Myocardial infraction (12.74%), Ischemic heart disease (13.72%), Cardiac Myopathy (10.78%), Hyperlipidaemia (8.82%), Heart Failure (5.88), Stroke (3.92), Angina pectoris (8.82).
- Drugs prescribed Pattern of different condition among the cardiovascular disease (Table 4) shows the prescription pattern of various categories of drugs for treatment of cardiovascular diseases patient's namely antihypertensive drugs, lipid lowering agents,

antiplatelets drugs, anti-anginals and diuretics. The usages of these drugs were analysis and recorded.

- In this study most commonly used antihypertensive drugs were betablockers, calcium channel blockers and diuretics are given to patients with hypertension condition.
- Most of the physician's prescribe single product rather than combination drugs. Carvedilol (29.4%), Amlodipine (80.3%) were the mostly preferred options for the patients. (Table 5) In the present study, Rosuvastatin (16.6%) was given to most of the patients whereas the second option was Atorvastatin (6.8%). (Table 5) In this study, (28, 4%) patients were only used clopidogrel, Aspirin and clopidogrel combination of drugs given to (14.7%) and aspirin (8.8%) and Warfarin (18.6%) were prescribed. (Table 5) In this study, direct vasodilators were used common treatment for cardiovascular patients, isosorbide di nitrate (36.2%) was the commonly prescribed antianginal drugs, followed by Ivabradine (25.4%) and nitro-glycerine (20.5%) was prescribed in patients. (Table 5) In this study identify that most commonly prescribed diuretic drug was Furosemide (51.9%), followed by the Hydrochlorothiazide (30.3%) and Mannitol (3.9%) was to the minority of the patients.
- The present study found that non cardiovascular drugs prescribed to treat associated medical conditions were antiulcer drugs, antidiabetic drugs, bronchodilators and multivitamins as per the patients need.

CONCLUSION:

The current study appear that most of drugs were prescribed rationally according to the recent treatment guidelines except the under use of angiotensin-converting enzymes and ARB's in DM and hypertensive patients. The use of ant-platelet and ant coagulated is use addition in the essential treatment as well as prevention of IHDs. Standard medical treatment guidelines should be spread among practicing physicians to motivate rational prescription,

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