ASSESSMENT OF MYOCARDIAL INFARCTION, ANGINA, CONGESTIVE CARDIAC FAILURE PATIENTS PRESCRIBING PATTERN IN A TERTIARY CARE HOSPITAL-RETROSPECTIVE STUDY

ABSTRACT

Introduction:

Analysis of the prescribing patterns is essential to improve rational prescribing in cardiac patients to decrease the risk associated with cardiovascular drugs & also to reduce morbidity and mortality. However, this type of study is progressively more important because of a boost in marketing of new medicines, variations in the prescribing and consumption of drugs, growing concern about delayed adverse effects, cost of drugs, and volume of prescription provokes us to carry out this study.

Objectives:

To evaluate cardiovascular disease (MI, ANGINA, and CCF) drugs prescribing pattern & its cost.

Methods:

This study is a Retrospective case study carried out for a period of 6months at Sagar Hospitals, Bangalore. Collect the required data were in a structured questionnaire.

Results:

Out of 250 patient cases observed showed patients with age 60-69 were 31.6% followed by 50-59 were 26.8% are more prone to CAD than the other age category & males were more when compared to females. The study showed the highest number of patients suffering from Angina and the second highest in MI, and the few patients have been diagnosed with CCF.

Conclusion:

This study showed that Coronary artery disease was managed by antiplatelets, antihypertensives, statins, and diuretics;

Angina has the highest diagnosis rate under this study. However, the antianginal drug class does not practice well. However, These studies also show the path for the pharmacist's role in promoting rational drug promotion in cardiac disease management.

Keywords: CAD: Coronary artery disease, ACS: Acute coronary syndrome, AMI: Acute myocardial infarction, HF: Heart failure.

Introduction:

Prescription Pattern study helps understand the extent and profile of drug use, trends, quality of drugs, and drug usage from essential medicine lists and generic medications. The prescribing pattern also helps to monitor, evaluate, and suggest modifications in prescribing use to promote rational and cost-effective.

The coronary arteries are the ones that carry blood to the heart. Coronary artery disease causes due to narrowing or blockage of the coronary arteries due to atherosclerosis. Atherosclerosis defines the build-up of cholesterol and fatty deposits (called plaques) inside the blood vessels. These plaques can clog the arteries or damage the arteries, limiting or stopping blood flow to the heart muscle, causing chest pain (angina) or a heart attack.

Ischemic Heart disease (IHD) is defined as a lack of oxygen and decreased or no blood flow to the myocardium resulting from coronary artery narrowing.

India's obstructed estimated prevalence of cardiovascular disease (CVDs) was 54.5 million. One in 4 deaths in India is now because of CVDs with ischemic heart disease and stroke responsible for >80% of this burden**. [1-3]**

India has the highest burden of ACS in the world. The CREATE registry has provided data on 20,468 patients from 89 centers from 10 regions and 50 cities in India. [4]

In the OASIS 2 registry, the two-year mortality rates adjusted for baseline covariates were double in India (15%) than in China (7%).[5]

The annual incidence of HF for patients with CHD ranges from 0.4% to 2.3% per year, [6, 7] suggesting that 120 000–690 000 Indians could develop symptomatic HF due to CHD every year, assuming none has HF at baseline and the at-risk population does not diminish. After five years, the total number of HF patients accrued could range from 600 000 to 3.5 million; with an estimated 50% mortality at five years, [8]

The pharmacotherapeutic Management of MI showed that aspirin (162 to 325 mg per day) to be given to all patients with suspected acute MI. It continued indefinitely at 75 to 162 mg per day upon discharge.

Clopidogrel (Plavix), prasugrel (Effient), and ticagrelor (Brilinta) are recommended drugs in combination with aspirin for a minimum of 12 months in patients receiving drug-eluting stents and for up to 12 months in patients receiving bare-metal stents.

Clopidogrel and ticagrelor were suggestive/used for conservative medical Management of MI in combination with aspirin (162 to 325 mg per day) for up to 12 months.

Statin therapy is recommended after a myocardial infarction (MI) and should be continued indefinitely in patients without contraindications. **[9]**

The pharmacotherapeutic Management of Angina shows: The history, examination, ECG, and laboratory tests provide important prognostic information, Echocardiography, Stress testing. [10] Along with Drug therapy: Nitrates (short- and long-acting): Relief of acute or anticipated pain (short-acting) Prevention of angina (long-acting) Beta-blockers: first-line treatment for exertional angina and after myocardial infarction, Dihydropyridine calcium channel antagonists (e.g., amlodipine, felodipine, nifedipine): Alternative, or in addition, to a beta-blocker Coronary spasm, Non-dihydropyridine calcium channel antagonists (e.g., verapamil, diltiazem): Alternative, or in addition, to a beta-blocker, Nicorandil: Angina, Ivabradine: Angina Chronic heart failure, Perhexili: Refractory angina. [11-14]

Heart failure (HF) will be managed by Diuretics (thiazides, loop diuretics, and potassium-sparing), Angiotensin-converting enzyme inhibitors (ACEIs), or angiotensin receptor blockers (ARBs), Beta-adrenergic blockers, Aldosterone antagonists, Digoxin, Anticoagulant. [15-16] is very widely practiced based on the severity of the case.

Need for Study: Advances in the technology, increase in marketing of new drugs, variations in the pattern of prescribing and consumption of drugs, growing concern about delayed adverse effects, cost of drugs, and volume of prescription provokes us to carry out this present study with the following.

Objectives:

- To categorize the type of cardiovascular disease (CVD) and the class of drugs used.
- To calculate the cost of specified medicines used in disease management.

Methodology:

The study approval was obtained from the IEC (Institutional Ethics Committee) before starting the study. After receiving the IEC clearance, the study was carried out.

A retrospective study (data collected from 2018 to 2020) was conducted in Sagar Hospital, Banashankari, Bengaluru. The data was collected by using the well-designed form from the MRD department. The study was carried out for six months. (Dec 2020- May 2021)

Inclusion Criteria: All the Patients had cardiovascular diseases (MI, ANGINA, CCF) With or without comorbidities.

Exclusion Criteria: Incomplete patient records, before the 2018 year case records

Sources of Data: Lab reports, accounts departments & pharmacy, Case reports of the patients.

Method:

Step 1: Collection of the demographic details of the patient (name, age, sex) and data regarding diagnosis, prescribed drugs, indication and their route of administration, and several days stay in hospital.

STEP 2: Assessment of CVD prescribing patterns

STEP 3: Assessment of the type of cardiovascular disease used and its class.

Step 4: Calculate the cost of the prescribed drugs.

STEP 5: The obtained data were subject to descriptive statistical analysis

Results:

Among the 250 cases observed, the age categories of the patients were 30-39(4.4%), 40-49(16%), 50-59(26.8%), 60-69(31.6%), 70-79(15.6%), and 80-89 (5.6%). This study highlights that 22.4 % were female s, 77.6 % were males. The mean hospital stay was 3.91 ± 2.73, the minimum number of hospital stays was from 1 day to a maximum of 15 days.

The final diagnosis showed most of the patients suffering from (IHD 6.4%), (ACS 4.8%), (effort angina4.4%), coronary artery diseases (single, double, and triple vessel disease 4%), and some of most minor cases of patients suffering from recent angina (0.4%)

The clinical outcome showed improved the majority of the patients. Only one case was referred to a different hospital (0.4%) and discharged one admission on request (0.4%). Interestingly 92.8 % of the cases were managed with antiplatelet drugs.45.2 % were with Aspirin + clopidogrel (150 mg+75 mg) combination. The alone prescribed antiplatelet drugs were Asprin (

), Ticoglar(17.6%)

The table 1 showed the mean cost of various categeroies of the drugs used in different cardiovascular disease conditions in the below .

Table 1: Distribution of the mean cost of the various categories of the drugs

Diagnosis	N	Total Price of Anticoagulant(INR) Mean ± SD	Total cost of Anti-platelets(INR) Mean ± SD	Total Price of Antihypertensive(INR) Mean ± SD	Total price of Diuretics(INR) Mean ± SD	Total price of Statins (INR) Mean ± SD	Total price of Nitrates(INR) Mean ± SD	Total price of Cardiac glycosides (INR) Mean ± SD	Total price of Benzodiazepines(INR) Mean ± SD	Total price of Analgesics (INR) Mean ± SD
IHD with Normal Ejection fraction	9	730.427 ± 392.96	105.22±107.77	78.86 ±84.18	19.71 ±52.57	63.55 ± 63.34	42.24 ±67.09	5.72± 9.90	1.36	37.9± 47.43
IHD < 50 ejection fraction	7	432.26 ± 721.38	57.14 ±47.26	106.8 ±113.62	34.19 ±63.55	33.84 ± 56.73	32.29 ±77.77	55.06 ±86.2	5.28	0
CCF alone	7	681.94±508.59	105.77±127.45	90.77 ±175.9	44.48 ±41.23	37.28 ±38.28	13.4± 25.59	5.68± 11.28	1.23± 2.13	1.17± 3.09
CCF with other disease	1	561.28	36	9.84	22	0	0	0	0	0
NSTEMI	30	702.20±718.68	127.49±168.26	39.1± 56.6	7.56± 12.91	1313.79±6943.36	29.58 ±91.68	3.80± 4.41	8.75± 9.2	8.17± 28.51

STEMI	11	510.26±350.90	220.20±142.40	39.0±26.6	8.31±13.14	54.87±63.28	5.66±10.18	0	4.21±3.89	2.2±7.50
Stable Angina	60	2172.34±14586.19	72.4±102.18	39.16±86.5	7.28±20..91	26.06±71.09	11.14±36.51	1.54±2.54	2.87±1.59	70.42±493.52
Unstable Angina	21	445.29±412.17	62.67±99.86	26.39±47.7	19.8±60.20	33.75±49.00	16.32±46.97	0.33±0.66	4.22±0.91	2.87±12.7
Double vessel coronary disease	33	650.63±875.99	120.68±126.54	41.98±41.4	12.65±43.5	52.10±46.21	27.16±55.8	7.29±10.82	4.99±3.19	274.9±1178.84
Single vessel coronary disease	38	452.15±438.54	183.85±214.88	40.77±73.39	35.8±105.98	39.07±40.31	8.64±17.55	15.54±21.36	4.41±2.07	234.18±864.03
Tricuspid valvular coronary disease	24	470.03±428.60	105.6±147.41	70.55±154.2	27.26±54.95	27.81±33.41	66.54±118.56	12.78±23.22	5.20±5.14	131.13±525.89
NSTEMI with other disease	4	420.96±362.30	127.32±72.46	28.05±21.09	7.62±12.1	50.82±17.60	31.7±63.54	1.3	2.7	17±26.02
STEMI with other disease	5	492.27±469.09	77.24±99.28	21.03±21.0	26.19±40.48	39.19±43.69	22.11±31.79	3.31±0.94	0	0

The study of the mean cost of the various classes of drugs for each diagnosis showed:

The total prices of anticoagulants are more in (stable angina) patients than in another diagnosis.

The total price of antiplatelets is more in (STEMI) patients than in another diagnosis.

The total price is more in (IHD<50 ejection fraction) patients than in another diagnosis.

The total price of diuretics is more in (CCF) patients than in another diagnosis.

The total price of statins is more in (NSTEMI) patients than in another diagnosis.

The total price of nitrates is more in (tricuspid valvular coronary disease) than in another diagnosis.

The total price of cardiac glycosides is more in (IHD< 50 ejection fraction) patients than in .another diagnosis.

The total price of benzodiazepines is more in (NSTEMI) patients than in another diagnosis.

The total price of analgesics is more in (CAD_DVD) patients than in another diagnosis.

The study showed that 231(92.8%) patients had taken antiplatelet, and 18 patients had not taken antiplatelet.

The table2 mainly focused on various classes of drugs used in the cardiovascular disease management with various strengths below

Table2 : Distribution of various classes of drugs

Drugs	Frequency(%)
No	147(58.8)
ASPIRIN(75MG/OD).CLOPIDOGREL(75MG/OD)	2(0.8)
ASPIRIN(75MG/OD).TICAGRELOR(90MG/BID)	44(17.6)
ASPIRIN(150MG/OD)	2(0.8)
ASPIRIN(150MG/OD),CLOPIDOGREL(75MG/OD)	3(1.2)
ASPIRIN(325MG/OD),CLOPIDOGREL(600MG/OD)	1(0.4)
ASPIRIN(75MG/150MG/OD),TICAGRELOR(90MG/BID)	1(0.4)
ASPIRIN(75MG/OD)	5(2.0)
ASPIRIN(75MG/OD),TICAGRELOR(90MG/BID),TIROFIBAN(10ML)	4(1.6)
ASPIRIN(75MG/OD),TICAGRELOR(90MG/BID),TIROFIBAN(6ML)	11(4.4)

ASPIRIN(75MG/OD),TICAGRELOR(90MG/BID),TIROFIBAN(7ML)	1(0.4)
ASPIRIN(75MG/OD),TICAGRELOR(90MG/BID),TIROFIBAN(9ML)	1(0.4)
ASPIRIN(75MG/OD),TIROFIBAN(11ML)	1(0.4)
ASPIRIN(75MGOD),TICARELOR(90MG/BID),TIROFIBAN(4ML/HR)	1(0.4)
ASPIRIN(75MGOD),TICARELOR(90MG/BID),TIROFIBAN(5ML/HR)	2(0.8)
ASPIRIN(75MGOD),TICARELOR(90MG/BID),TIROFIBAN(8ML/HR)	4(1.6)
CILOSTAZOL(100MG/OD)	1(0.4)
CLOPIDOGERL(150MG/OD)	3(1.2)
CLOPIDOGREL(150MG/OD),ASPIRIN(75MG/OD),TICAGRELOR(90MG/BID)	1(0.4)
CLOPIDOGREL(150MG/OD)+(75MG/OD),ASPIRIN(150MG/OD)	1(0.4)
CLOPIDOGREL(75MG/OD)	4(1.6)
CLOPIDOGREL(75MG),ASPRIN(325MG)	1(0.4)
CLOPIDOGREL(75MG/OD),ECOSPRIN(75MG/OD),TICAGRELOR(90MG/BID)	1(0.4)
ECOSPRIN(75MG/OD),TICAGRELOR(90MG/BID)	1(0.4)
TICAGRELOR(90MG/BID)	3(1.2)
TICARELOR(150MG/BID)	1(0.4)
TIROFIBAN(0.7MG/HR)	1(0.4)
TIROFIBAN(10ML/HR)	1(0.4)
Total	250(100.0)
Anti platelets +statin combinations	
ASPIRIN(75MG)+ATORVASTATIN(10MG)/OD	9(3.6)

ASPIRIN(75MG)+CLOPIDOGREL(75MG)+ATORVASTATIN(10MG/OD)	14(5.6)
ASPIRIN+ATORVASTATIN(150/20MG/OD)	4(1.6)
ASPIRIN+ATORVASTATIN(75/20MG/OD)	1(0.4)
ASPIRIN+ATORVASTATIN+CLOPIDOGREL(20MG/OD)	6(2.4)
ASPIRIN+CLOPIDOGREL+ROSUVASTATIN(10MG/OD)	13(5.2)
ASPIRIN+ROSUVASTATIN(75/10MG/OD)	1(0.4)
ASPIRIN+ROSUVASTATIN+CLOPIDOGREL(20MG/OD)	1(0.4)
ATORVASTATIN+CLOPIDOGREL(75/10MG/OD)	4(1.6)
CLOPIDOGREL(75MG)+ROSUVASTATIN(10MG)/OD,ASPIRIN+CLOPIDOGREL+ATORVASTATIN(20MG/OD)	1(0.4)
CLOPIDOGREL+ROSUVASTATIN(75MG/10MG/OD)	2(0.8)
No	194(77.6)
Total	250(100.0)
Antihypertensive 213(85.2)	
Beta Blockers Alone	
1.METOPROLOL SUCCINATE(25MG/BID)2.METOPROLOL TARTRATE(25MG/BID)	1(0.4)
1.METOPROLOL SUCCINATE(25MG/OD)2.BISOPROLOL(1.25MG/OD)	1(0.4)
1.METOPROLOL SUCCINATE(25MG/OD)2.NEBIVOLOL(5MG/OD)	1(0.4)
BISOPROLOL(1.25MG OD)	2(0.8)
CLONIDINE(100MCG BID)	1(0.4)
METOPROLOL SUCCINATE(12.5MG/BID)	4(1.6)
METOPROLOL SUCCINATE(12.5MG/OD)	15(6)
METOPROLOL SUCCINATE(12.5MG/OD),METOPROLOL TARTRATE(12.5MG/BID)	1(0.4)

METOPROLOL SUCCINATE(12.5MG/OD),METOPROLOL TARTRATE(25MG/BID)	1(0.4)
METOPROLOL SUCCINATE(25MG/BID)	18(7.2)
METOPROLOL SUCCINATE(25MG/OD)	51(20.4)
METOPROLOL SUCCINATE(25MG/OD),BISOPROLOL(1.25MG/OD)	1(0.4)
METOPROLOL SUCCINATE(25MG/OD),METOPROLOL TARTRATE(25MG/BID)	1(0.4)
METOPROLOL SUCCINATE(25MG/OD),METOPROLOL TARTRATE(25MG/OD)	1(0.4)
METOPROLOL SUCCINATE(25MG/OD),OLMESARTAN MEDOXOMIL(40MG OD)	1(0.4)
METOPROLOL SUCCINATE(50MG/OD)	11(4.4)
METOPROLOL TARTRATE(25MG/BID)	17(6.2)
METOPROLOL TARTRATE(25MG/OD)	3(1.2)
METOPROLOL TARTRATE(50MG/BID)	1(0.4)
NEBIVOLOL(2.5MG/BID)	1(0.8)
NEBIVOLOL(5MG/BID)	1(0.4)
No	115(46)
Total	250(100)
Beta blockers + Alfa blockers	
Carvedilol (3.125mg BD) +(6.5 mg BD)+(25 mg OD)	2(0.8) + 1(0.4) + 2(0.8)
Beta blockers + ARB	
OLMESARTAN MEDOXOMIL+METOPROLOL SUCCINATE(25MG/BID)+(25MG/OD)+(50MG/OD)	3(1.2)+20(8.0)+4(1.6)
TELMISARTAN+METOPROLOL SUCCINATE(40/25MG/OD)+ (40/50MG/BID)	8(3.2)+2(0.8)

Beta blocker with CCB	
AMLODIPINE(5MG)+METOPROLOL SUCCINATE(25MG)/OD	1(0.4)
AMLODIPINE+METOPROLOL SUCCINATE(25/50/OD)	1(0.4)
Beta Blockers with ACEIs	
METOPROLOL SUCCINATE+RAMIPRIL(25MG/2.5MG OD)+50mg/5mg OD	1(0.4)+5(2)
ARBs Alone	
Losartan (25 mg OD) & 50 mg OD	1(0.4)+2(0.8)
Olmesartan 20mg OD & 20mg BD	15(6) + 1(0.4)
Telmisartan 20 mg OD + 40mg BD+ 40 Mg OD	5(2)+2(0.8)+9(3.6)
ARB Combinations	
Telmisarton(40mg)+ Amlodipine 5mg	2(0.8)
Telmisartan 40 mg+ Hydrochlorothiazide 12.5 mg	4(1.6)
Telmisarton(40mg)+ Amlodipine 5mg + Hydrochlorothiazide	1(0.4)
Telmisarton(40mg)+ Chlorothalidone12. 5mg	1(0.4)
Valsartan(26mg)+Sacubitril(24mg) BD	2(0.8)
Calcium channel blockers	
Amlodipine 10 mg BD& 10 mg OD & 5mg BD & 5mg OD	2(0.8)+1(0.4)+7(2.8)+4(1.6)
Clinidipine 10 mg BD & 10 mg OD & 10 mg TID	2(0.8)+2(0.8)+1(0.4)
Diltiazem 15 mg TID & 15 mg BD & 30 mg TID & 90 mg OD	4(1.6)+1(0.4) + 2(0.8) + 3(1.2)
Calcium channel combination	
Amlodipine+Metoprolol Succinate(50/5mg/Bid)	1(0.4)
ACE Inhibitors alone	
Enalapril(5mg/Od)	2(0.8)

Ramipril(1.25mg/Od) & 1.5 mg OD & 2.5 mg OD & 5 mg BD & 5 mg OD	18(7.2) +1(0.4)+15(6)+1(0.4)+5(2)
Alpha Blocker alone	
Carvidelol (3.125 BD)	1(0.4)
Clonidine100mcg/TID+Clondine100mcgBD	3(1.2)+1(0.4)
Prazosin 2.5mg+ Prazosin 5 mg	4(1.6)+4(1.6)
Silidosin	1(0.4)
Distribution of diuretics	
Eplerenone(25mg,Od)	2(0.8)
Spiranolactone 25mg BD+ Spiranolactone 25mg OD + Spiranolactone 50mg OD	2(0.8)+12(4.8)+3(1.2)
Furosemide 100 mg OD+ Furosemide 20 mg BD + Furosemide 20 mg TID +Furosemide 40mg BD +furosemide 40mg OD+Furosemide 40 mg TID	3(1.2)+5(2) +12(4.8)+39(15.6)+12(4.8)+ 15(6)
Torsemide 10 mg BD	1(0.4)
Metolazone(2.5mg OD)	1(0.4)
Nebivolol+Hydrochlorthiazide(12.5mg/Bid)	1(0.4)
Spironolactone(50mg)+Torsemide(50mg)/OD	2(0.8)
Distribution of statins	
Atorvastatin(10mg/Od)+ Atorvastatin(20mg/bd+)+ Atorvastatin(20mg/OD+)+ Atorvastatin40mgOD+)+ Atorvastatin(40mg/bd+ Atorvastatin(80mgod	13(5.2)+1(0.4)+51(20.4)+61(24.4)+1(0.4)+9(3.6)+
Rosuvastatin(10mg/Bid)+ Rosuvastatin(10mg/OD+ Rosuvastatin(20mg/OD)+ Rosuvastatin(20mg/BD+ Rosuvastatin(40mg/OD+ Rosuvastatin(5mg/OD	2(0.8)+11(4.4)+10(4)+2(0.8)+ 1(0.4)+1(0.4
Atorvastatin(20mg/Od),Rosuvastatin(20mg/Od)+ Atorvastatin(40mg/Od),Rosuvastatin(10mg/Od	2(0.8)+1(0.4)
Statin Combinations	

Rosuvastatin+Ezetimibe(10mg/Od)	2(0.8)
Distribution of nitrates	
Isosorbide Monotrate (10mg Bid)+ Isosorbide Monotrate (10mg Od)+ Isosorbide Monotrate (20mg Bid)+Isosorbid mononitrate 30mg+Isosrobid mononitrate 50mg+Isosorbid mononitrate 5mg	14(5.6)+3(1.2)+1(0.4)+2(0.8) +2(0.8)+5(2)
Isosorbide Dinitrate(10mg Bid)	1(0.4)+
Nitroglycerin(0.25mg OD)+ Nitroglycerin (1.2/H)+Nitroglycerin(10mg/H)+ Nitroglycerin (1.2/H)+Nitroglycerin(5mg OD)+ Nitroglycerin(5mg TID)+ Nitroglycerin(25mg OD)+ Nitroglycerin(25mg BD)	2(0.8)+1(0.4)+1(0.4)+1(0.4)+ 1(0.4)+3(1.2)+1(0.4)+1(0.4)
Nitroglycerin(2.6mg OD)+ Nitroglycerin(2.6mg BD)	7(2.8)+33(15.2)
Isosorbide Dinitrate(10mg Bid)+Hydralazine 20 mg TID	3(1.2)
Cardiac glycoside(Digoxin 0.25 mg OD)+ (Digoxin 0.25 mg BD)	38(15.22)+1(0.4)
Benzodiazapines	
Alprazolam 0.25mg OD+ Alprazolam 0.5mg OD+ Zolpidem 5mg OD	27(10.8)+17(6.8)+1(0.4)
Paracetamol	19(7.6)
Tramadol+Paracetamol BD	9(3.6)
Antiarrythmics (Amiadirone) 200 mg OD	9(3.6%)
Antianginals(Ivabradine 5mg BD; Ranolazine 500mg BD;Trimetazidine 35 mg BD	5(2)
Antidiabetics(Human Insulin)	15(6)
Glimiperide 2mg+Metformin 500 mg BD	12(4.8)
Antibiotics	70(28)
Cefuroxime 750 mg BD	15(6)
Amikacin 250 mg BD	14(5.6)
Cefoperazone+Sulbactam(1.5gm/Bid)	15(6)
Amoxycillin+clavalunic acid	4(1.6)

Piperacillin/Tazobactam	4(1.6)
Anti ulcer agents	
Pantaprazole 40 mg OD+ Pantaprazole 40 mg BD	73(29.2)+31(12.4)
Ranitidine 150 mg BD	14(5.6)

Discussion:

This study was carried out to assess the prescribing patterns of coronary artery disease patients in Sagar Hospitals.

Among the 250 observed cardiovascular disease cases showed, the mean hospital stay of the patients was 3.91 ± 2.73, the minimum number of hospital stays was from 1 day to a maximum of 15 days because of the patients' condition and the severity of the disease depended on their past medical history.

The age category of the patients highest percentage showed more in, 40-49(16%), 55-59(26.8%), 60-69(31.6%), 70-79(15.6%), 80-89(5.6%).

This means that patients aged 60-69 have the highest percentage (31.6%) of coronary artery disease compared to other age ranges under the study population. A further similar study was conducted by Kumar Mukesh et al. (2016). A total of 112 cases were evaluated. Between 61-90 years, patients of age group were diagnosed 48.21% of cardiovascular diseases (CVDs). [17]

This study showed that males 77.6% are more prone to coronary artery disease than females22.4%; a similar study conducted by Zafar F et al. in their study results indicated that males (55%) patients had a high frequency of cardiovascular incidences as compared to females (45%) patients.[19]

This study showed that most patients suffer from IHD (6.4%), ACS (4.8%), and angina (4.4%). The present research Coronary Artery Group showed that most patients suffering from MI 44.8 %(nonSTEMI, STEMI, SVD, DVD, TVD) and stable angina 24% and the least diagnosed disease is CCF 0.4%. Kiran P. Vakade et al. (2015) found that Myocardial infarction (50%) was

the most common cardiovascular emergency treated during the study period, followed by unstable angina (36.58%). [17-19]

Interestingly the clinical outcomes of these studies showed the majority were improved except one case was referred to a different hospital and one on discharge request.

The distribution of the mean cost of the various classes of drugs showed:

The total price (INR) of anticoagulants is more in (stable angina) patients than in other diagnoses (2172.34±14586.19). The total cost (INR) of anti-platelets is more in (STEMI) patients than in another diagnosis (220.20±142.40). The total price (INR) of antihypertensive is more in (IHD<50 ejection fraction) patients than in other diagnoses (106.8±13.62). The total cost (INR) of diuretics is more in (CCF) patients than in other diagnoses (44.48±1.23).

The distribution of the mean cost of the various classes of drugs showed: The total price (INR) of anticoagulants is more in (stable angina) patients than in other diagnoses (2172.34±14586.19). The total cost (INR) of anti-platelets is more in (STEMI) patients than in another diagnosis (220.20±142.40). The total price (INR) of antihypertensive is more in (IHD<50 ejection fraction) patients than in other diagnoses (106.8±13.62). The total cost (INR) of diuretics is more in (CCF) patients than in other diagnoses (44.48±1.23).

The total price (INR) of statins is more in (NSTEMI) patients than in other diagnoses (1313.79±6943.3). The total cost (INR) of nitrates is more in (tricuspid valvular coronary disease) than in other diagnoses (66.54±118.56). The total price (INR) of cardiac glycosides is more in (IHD< 50 ejection fraction) patients than in other diagnoses (55.06±86.2). The total cost (INR) of benzodiazepines is more in (NSTEMI) patients than in other diagnoses (8.75±9.2). The total price (INR) of analgesics is more in (CAD_DVD) patients than in other diagnoses (274.9±178.8).

Based on the mean cost of each class of drugs, the highest amount belongs to the total price of anticoagulants, and the least amount belongs to the full price of the benzodiazepines.

The study showed that 231 (92.8%) patients out of 250 were prescribed and treated with antiplatelets. The most common prescribed antiplatelets are aspirin and clopidogrel. 85.2 % were treated with antihypertensives.

The most common class of antihypertensive, which is defined alone and in combination, is beta-blockers; under the category of beta-blockers, the highest prescribed drugs are metoprolol. The other classes of antihypertensive prescribed are 15.6% of patients with ARBs. Under this class, the most prescribed drugs are olmesartan medoxomil and telmisartan. 34(13.6%) patients prescribed with CCBs; under this class, the most prescribed drugs are diltiazem and amlodipine.

42(16.8%) patients with ACEIs, under this class, the most prescribed medication is ramipril
12(4.8%) patients were prescribed alpha-blockers; the most prescribed drug under this class is prazosin

This study showed 40% of patients were prescribed and treated with diuretics. Under this class, 19(7.6%) patients were treated with potassium-sparing diuretics, and the most frequent drug of this class is spironolactone, and 88(35.2%) patients were treated with loop diuretics. The most frequent medication prescribed under this class is furosemide, and only two patients are treated with thiazide diuretics.

67.6% of patients were prescribed and treated with statins; under this class, the highest prescribed drug is atorvastatin, and the second drug is rosuvastatin.
The study showed that 89(35.6%) patients were prescribed and treated with nitrates; the most prescribed drugs under this class are isosorbide mononitrate and nitroglycerin
39(15.6%) patients were prescribed cardiac glycosides, and the most prescribed medication under this class is digoxin
45(18%) patients were treated with benzodiazepines; the most prescribed medication for this class is alprazolam
34(13.6%) patients were treated with analgesic alone, and the most prescribed medicine is paracetamol, and also 15(6%) patients were treated with analgesics combination, and the most frequent combination is tramadol with paracetamol

The study showed that 9(3.6%) patients were prescribed with antiarrhythmic and the only drug prescribed under this class is amiodarone; the study also showed that 5(2%) were defined and treated with anti anginal which is significantly less and has to be practiced

Diabetes mellitus is always one of the most common risk factors for heart diseases; this study showed that 70(28%) patients were prescribed antidiabetic drugs. The most frequent drugs used are insulin and glimepiride. Metformin antidiabetic drugs in combination are also specified, and the most frequent combination is glimepiride with metformin.

This study showed that 70(28%) patients were prescribed antibiotics. The most prescribed drugs are cefuroxime and ceftriaxone. Under this class, medicines are also specified in combination, and the most frequent combination is cefoperazone with sulbactam.

The study showed that acid-lowering agents are prescribed with a high frequency of 130(52%). In addition, patients have received acid-lowering agents in which the most prescribed drug is pantoprazole.

This observed results of other classes of drugs that have been prescribed and some of those might directly be related to this study diseases and here brought some of those classes, ivabradine a hyperpolarization-activated cyclic nucleotide (HCN) channel blocker, Ondansetron a 5-HT3 antagonist, Pheniramine which is a first-generation antihistamine in the alkylamine class, Nicorandil is a potassium channel activator, Dopamine is an inotropic agent, Thyroxin is a thyroid hormone, Acebrophylline is a mucolytic and bronchodilator.

Conclusion:

This study noted that people aged 60-69 are more prone to coronary artery diseases and showed males are more than females. The study showed that angina has a higher illness rate & the majority of the patients were prescribed and treated with antiplatelet, antihypertensive, statins and diuretics, and other drugs.

This study also showed that a combination therapy management strategy for coronary artery disease is well-practiced. The prescription of antianginal drugs usage is significantly less. Therefore, clinical pharmacist services play a significant role in cardiac drug utilization/ cardiac drug therapy. In addition, the cardiac drug expert specialization in these areas will help in Rational Drug promotion.

Limitations: 1. The study Duration was only six months 2. The pandemic situation creates many hurdles like Lack of time, accessible patients cases, and collection of data is restricted to the afternoon section only

Future directions:

1. This type of study can be carry for a longer duration

2. Implementation of an electronic database/or medical record system will be helpful for the further depth research

3. This type of study can help in better understanding coronary artery disease patients, prescribing patterns, and improving the quality of therapy and quality of life

4. Prescription Patterns study helps understand the extent and profile of drug use, trends, quality of drugs, and usage of drugs from essential medicine list and service of generic drugs.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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