ORIGINAL ARTICLE

Prescribing Trends in Cardiovascular Conditions: A Prospective Cross-Sectional Study

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ABSTRACT

Aim: To study prescribing trends for the cardiovascular condition at a multispecialty hospital.

Methods: The Prospective observational study was conducted in cardiovascular conditions in all age population for the period of eight months. Study-related data was collected in Case record form. Data analysis was done by evaluating trends of drug usage.

Results: Two Hundred cases were registered and evaluated, out of that 126 were male and 74 were female cases. The mean age range for patients was 59.62 ± 11.61 years. In case of Hypertension 90 cases were registered (45%) and 53 (26.5%) cases for coronary artery disease, while 37(18.5%) patients were reported with Congestive heart failure (CHF). Patients of coronary artery disease with congestive heart failure (CHF) were 23 (11.5%). In our study Clopidogrel and aspirin were prescribed frequently, followed by atorvastatin (85%). An average number of drugs prescribed was 6.79 per patient. Percentage of drugs prescribed by generic name was 10.28%.

Conclusion: The present study provides valuable insight into the overall pattern of drug used in cardiac conditions; however, rationality of prescription could add more insight into the study.

Key words: Cardiovascular diseases; heart; hypertension; ischemic heart disease; congestive heart failure

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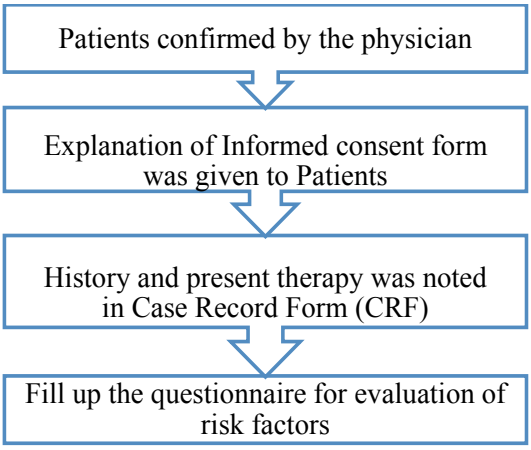
INTRODUCTION

Cardiovascular diseases (CVDs) generally affect the heart and the circulatory system which include hypertension, Ischemic heart disease (IHD), congestive heart failure (CHF), stroke, peripheral artery disease. Important modifiable risk factors of CVDs are an unhealthy diet, physical inactivity, tobacco use, and the effects insinuate abnormal blood lipid profile and obesity.[1] As the century progresses with all use of technology and advancement and lack of exercise progresses into CVDs, which is the major health concern in India and a common cause of early mortality. In the world today 30% of deaths observed due to CVDs including nearly 40% in high-income countries and about 28% in middle and low-income countries. The global rise in CVD is the result of industrialization, urbanization and associated lifestyle changes.[2] Various classes of drugs are available for the management of CVDs. Commonly used drugs to treat CVDs are vasodilators, calcium channel blockers, beta blockers, diuretics, angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, antiplatelet and lipid-lowering agents.[3] The prescribing pattern gives an idea to prescribers about monitoring and evaluation of the drugs and recommends necessary modifications.[4] Various factors associated with inappropriate prescribing were ineffective and unsafe treatment, prolongation of illness, distress and unnecessary economic burden to the patient.[5,6]

METHODOLOGY

A prospective observational study was conducted at the multispecialty hospital, Ahmedabad with the study duration of eight months from June 2016 to January 2017. A total of 200 patients, who have attended the cardiology department with cardiovascular diseases were included in the study. A methodology of the study was followed as per the Chart.

The study was approved by the Institutional Ethics Committee at Dr. Jeevraj Mehta Hospital. The descriptive results were expressed as counts, percentages, mean, and mean ± Standard Deviation of Mean.



RESULTS

In the present study, CVD patients were of the age group 51-60 years (37.5%) followed by 61-70 years (20%) [Figure 1]. Male population (63%) had a higher prevalence of CVD than females (37%) as per result. A diagnosis was made by the physician's revealed different cardiovascular diseases prevailing among the patients. Maximum of 45% cases were of Coronary artery disease patients, whereas 26.5% of patients were diagnosed with Hypertension, congestive heart failure (CHF) cases were 18.5% and

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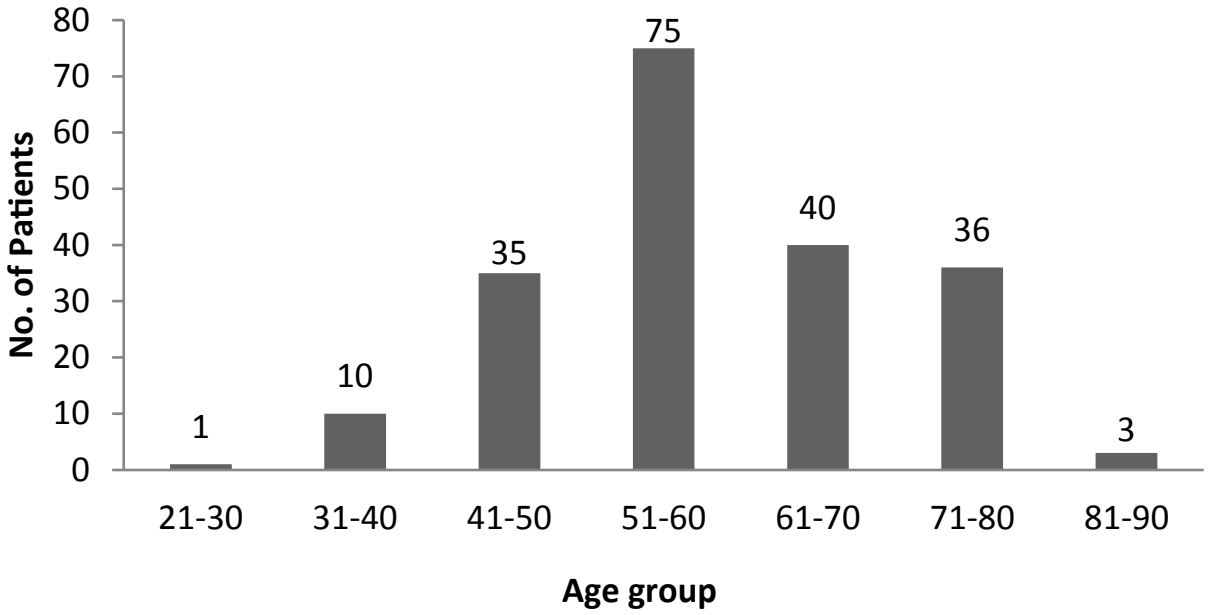

Figure 1: Age wise distribution of outdoor cardiovascular disease patients (n=200)

Table 1: Pattern of medical conditions among the outdoor cardiovascular disease patients (n=200)

Medical conditions	Number (n)	Percentage (%)
CAD	90	45%
Hypertension	53	26.5%
CHF	37	18.5%
CAD+HTN	23	11.5%
CAD+CHF	23	11.5%

Table 2: Medicine utilization trend among various therapeutic classes for cardiovascular conditions

S No	Drug Category	Percentage	Most frequently prescribed drugs	ATC code
1	Anti platelets	34%	Aspirin, Clopidogrel, Ticagrelor, Aspirin+clopidogrel	B01AC04, B01AC24
2	Dyslipidaemic agents	19%	Atorvastatin, Rosuvastatin	C10AA05, C10AA07
3	Beta blockers	14%	Metoprolol	C07AB02
4	Vitamins	12%	Folic acid+Ferrous fumarate	B03BB01+ B03AA02
5	Anti anginal agents	11%	Ivabradine, Trimetazidine dihydrochloride	C01EB17, C01EB15
6	ACE Inhibitors	8%	Ramipril	C09AA05
7	Diuretics	5%	Spironolactone, Torsemide	C03DA01, C03CA04

Table 3: Co-morbid conditions among the cardiovascular disease patients (n=200)

Co-morbidity	Number (n)	Percentage (%)
Diabetes Mellitus (DM)	65	32.5%
Dyslipidemia (Dys)	49	24.5%
DM+Dys	40	20%
Anemia	15	7.5%

Table 4: Different categories of drugs prescribed for co-morbid conditions among outdoor cardiovascular diseases

Class of drugs	No. of prescription (n)	Prescription rate (%)
	Anti-diabetic agent	
Metformin	87	43.5%
Glimepiride	50	25%
	Antacids	
Pantoprazole	79	39.5%
Ranitidine	15	7.5%

Table 5: Details of drug therapy in cardiovascular disease patients

Core Indicators	Value
Prescribing Indicators	
Average drugs prescribed per prescription	7
Generic name wise drug prescribed	5
Antibiotics used	0
Injections Used	3
Drugs listed in EDL (Essential Drug List) – India (2015)	319
Complementary Indicators	
Total No. of Drugs prescribed	769
Total No. of mono drugs prescribed	588
Total No. of Two combination drugs prescribed	99
Total No. of more than two combination drugs prescribed	78
Total No. of Cardiac drugs prescribed	497
Total No. of Vitamin supplements drugs prescribed	62

Coronary artery disease with CHF in 11.5% patients [Table 1]. Prescribing trends are the major concern for cardiovascular conditions, in present study antiplatelet, Dyslipidemia agents and Beta blockers were prescribed as 34%, 19% and 14% respectively, while antianginals, ACE inhibitors and diuretics were prescribed in 11%, 8%, 5% respectively. All cardiovascular drugs were mentioned with their ATC codes. Most frequently prescribed antiplatelet drug was clopidogrel, dyslipidemic drug as atorvastatin, beta blocker as metoprolol, antianginal as ivabradine and ACE inhibitor as Ramipril [Table 2]. Co-morbid conditions like diabetes mellitus, hyperlipidemia, hypertension, and anemia were also observed among outdoor patients. Diabetes mellitus (32.5%) and hyperlipidemia (24.5%) were the two most common co-morbid conditions found in most of the patients which increase the risk of cardiovascular disease morbidity and mortality [Table 3]. In comorbid condition prescribing rate for metformin was 43.5%, glimepiride 25% and pantoprazole 39.5% [Table 4]. Total number of drugs prescribed when patients visited to the cardiac outdoor department was 769. The average number of drugs per patient was 7. Out of the total number of 769 drugs prescribed 497 were cardiovascular drugs. The frequency of parental preparations in our study was 3(0.4%). Out of the total 769 prescribed drugs 319 were from essential drug list of India (2011) and 450 were out of essential drug list [Table 5].

DISCUSSION

Various studies have been conducted in past few years worldwide to determine the safe and effective use of drugs indicating that inappropriate drug use is a universal phenomenon.[7] Total 200 patients were observed and data analyzed during eight months of study period. Results pointed out that the frequency of cardiovascular outpatients department was more in male patients (63%) than female patients (37%), which is in accordance with the study conducted by Jousilahti and Chrysohoou.[8,9] In the present study, it was found that cardiovascular diseases were most common in the age group of 51-60 years (37.5%) followed by 61-70 years (20%). These results are in concordance with the study by Patil *et al.*[10] They observed that a maximum number of patients (39%) were in the age group of 51-60 years, followed by 27% patients in the age group of 61-70 years. This correlates with many studies which show increased the risk of CVD with increasing age. In the present study, Coronary artery disease (45%) and hypertension (26.5%) were the most common CVDs. Similar results were found in Zafar *et al.*[11] study in which 31% of patients had hypertension. George *et al.*[12] study showed 72.6% of patients were reported with Coronary artery disease. Diabetes mellitus and Dyslipidemia were the two most common co-morbid conditions found in the present study with 32.5% and 24.5% respectively. Anemia patients were 7.5%. Patil *et al.*[10] study showed 29% of patients with Diabetes mellitus and hyperlipidemia were reported 11%. Raut *et al.*[13] study showed 14.16% patients with anemia. In addition to this HTN and DM, both are risk factors for cardiovascular diseases. So apart from treating cardiovascular diseases patients need to be educated about risk factors and life style modifications. In the present study most commonly, prescribed antiplatelet drugs were (aspirin 89.5%, clopidogrel 82.5%) followed by Beta-blockers (Metoprolol 69.5%). Dual antiplatelet drug combinations were given in 12.5% patients. In a study conducted by Sandozi and Nausheen[14], various antiplatelet drugs prescribed were aspirin (25.71%), a combination of aspirin and clopidogrel (60.00%). In a study conducted by Mukesh *et al.*[15], Metoprolol were prescribed in 61.66% patients. One of the studies showed out of 81 patients in 72 patients were given dual antiplatelet drug combination.[16] In the present study, Atorvastatin was the most commonly prescribed hypolipidemic drug (52.5%). In the study by Rathod *et al.*[10] showed 53.10% atorvastatin was prescribed. It decreases blood LDL cholesterol level effectively with rising in the HDL level. The noncardiological drugs prescribed to treat associated medical conditions were antidiabetic drugs, antacids and multivitamins as per the need. In the present study, the average number of drugs per prescription was 7, which was in concordance with the previous study by Muhit *et al.*[1] The present and previous studies have not shown much variation in the average number of drugs per prescription. Study by Aswani *et al.*, had observed the total number of drugs prescribed 2918. The average number of drugs per patient was 16.21. Out of the total number of 2918 drugs prescribed, 34.47% (1006) were cardiovascular drugs. The frequency of parental preparations was 39.41% (1150), A total number of 1006 of cardiovascular medications prescribed, 92.34% (929) of drugs were non combinational cardiovascular drugs and 7.65% (77) were fixed dose category wise combinational drugs. Out of the total 1006 cardiovascular drugs, 57.05% (574) were from essential drug list of India (2011) and 42.94% (432) were out of the essential drug list.[17]

CONCLUSION

In the present study age was the most predominant factor for raising concern for CVDs. The most common co-morbid conditions associated with CVDs were diabetes and dyslipidemia. Anti-platelet drugs (34%) were prescribed most commonly as the main indication for CVDs, followed by dyslipidemia (19%). Polypharmacy was observed in the most of prescriptions with average 7 drug prescribing per patient. The prescribing pattern needs to be improved by reducing the number of drugs per prescription. It was observed that very few drugs were prescribed by generic name and 41.48% drugs were prescribed according to the Essential drug list of India 2015.

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