A Hospital-Based Assessment of the Drug Utilization Pattern in Cardiovascular Disease Patients

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Abstract

Aim: The aim of the present study was to evaluate the drug utilization in cardiovascular disease at a teaching and referral hospital in Bihar region.

Methods: The present study was conducted at Department of Pharmacology, DMCH, Darbhanga, Bihar, India for the period of 6 months. A total of 500 prescriptions of the patients attending cardiology OPD of the selected hospitals over a period of 6 months were randomly identified and included in this study.

Results: Based on the results obtained it is found that male patients 60% had high frequency of cardiovascular incidences when compared to female patients 40%. Out of 500 patients, 34% of patients (Male 22% and Female 12%) belong to the age group of 51–60 years which was considered to be highest percentage when compared to all other age groups and 9% of patients (Male 4% and Female 5%) present in the age group of 71–80 years which were considered to be lowest percentage among all age groups, these demographic data reveal the influence of gender and age in disease and prescribing pattern. During this study, different adjustable risk factors associated with CVDs were also observed in the patients particularly 4% of inadequate diet, 5% of physical inactivity, 18% of tobacco consumption, 22% of alcoholics, and 30% of obesity. In our study, a total of 75 (15%) of prescribed drugs were found to be FDCs, rest of the drugs 425 (85%) were prescribed as single dose. Aspirin + Clopidogrel combination is found to be highly prescribed FDC (40%) among all, next to that Telmisartan + Hydrochlorothiazide (15%) and Amlodipine + Atenolol (10%) were highly prescribed.

Conclusion: Polypharmacy and least use of generic name were observed in the study which may affect the rationality. The use of antiplatelets, statins, and angiotensin-converting enzyme-inhibitors was appropriate, but furosemide overuse is of major concern. Therefore, appropriate prescription writing improvises treatment compliance in the patients, which results in rationality.

Keywords: Cardiovascular disease, defined daily dose, prescribing indicators, rational drug use

Introduction

Cardiovascular disease (CVD) is the major reason of mortality among non-communicable diseases (NCDs), constituting 26% in India. [1,2] Relative to other NCDs, deprived quality of life and high mortality rate is mounting with CVDs regardless of highly developed health-care facilities. In India, patients with acute coronary syndrome (ACS) have higher rate of ST-elevation myocardial infarction (STEMI) than do patients in developed countries; the treatment options differ between rich and poor which significantly altered mortality and morbidity. [3] Women develop CVD at older age and have greater comorbidities than men, though treatment and outcome did not differ after adjusting potential confounders. [4] Appropriate and safe drug use is a key factor in achieving quality health and accurate health care for hospitalized as well as ambulatory patients. Extensive disparity exists in the pharmacotherapy pattern among CVD patients where rational drug use plays a pivotal role in promoting safety and efficacy. Polypharmacy is warranted in CVDs as it results in irrationality; hence, prescribing indicators were developed to assess the prescribing performance in primary care by the International Network for Rational Use of Drugs and World Health Organization (WHO). [5]

Prescription is a critical issue in the rational treatment. [6] Study of prescription patterns is an important to determine rationality of drug therapy and to maximize the utilization of resources. [7] The prescribing pattern reflects the physician's knowledge about the disease process and application of pharmacotherapeutics. [8] Studies on drug utilization pattern (DUP) have become a potential tool to be used in the evaluation of health-care system. [9] Drug utilization research encourages rational prescribing of drug, contributes to the knowledge of current use of drugs in the society and explore whether a particular intervention affects the drug use in the population by observing the drug use pattern. [7] By the end of 2020, India is predicted to be heart disease capital of the world with estimated rise of 111% in cardiovascular deaths. [10] Cardiovascular mortality rates in India are higher than the global average (272 vs. 235 per 1,00,000). [11] Despite such alarming projections, there is paucity of quality data on cardiovascular diseases (CVDs) in Indian population. [12]

The aim of the present study was to evaluate the drug utilization in cardiovascular disease at a teaching and referral hospital in Bihar region.

Materials and Methods

The present study was conducted at Department of Pharmacology, DMCH, Darbhanga, Bihar, India for the period of 6 months. A total of 500 prescriptions of the patients attending cardiology OPD of the selected hospitals over a period of 6 months were randomly identified and included in this study according to the inclusion criteria then critically analyzed using WHO core prescribing indicators, particularly different types of drugs prescribed and their prescribing pattern was determined. Prescriptions of patients with age < 30 and >80, pregnancy, lactation, critically ill patients, patients with lifestyle modification alone, prescriptions of outpatients of other departments, prescriptions of patients diagnosed with non-cardiac diseases, prescriptions of patients those not willing to participate were excluded from this study.

Statistical analysis

The data was collected, compiled in MS-Excel, and analyzed for counts and percentages. The mean and standard deviation was computed for continuous variables. Graphical representation has been used for visual interpretation of the analyzed data.

Results

Table 1: Age- and gender-wise distribution of CVD patients

Age in years	No. of patients	%	Male	%	Female	%
30–40	65	13	50	10	15	3
41–50	120	24	70	14	50	10
51–60	170	34	110	22	60	12
61–70	100	20	50	10	50	10
71–80	45	9	20	4	25	5
Total	500	100	300	60	200	40

Based on the results obtained it is found that male patients 60% had high frequency of cardiovascular incidences when compared to female patients 40%. Out of 500 patients, 34% of patients (Male 22% and Female 12%) belong to the age group of 51–60 years which was considered to be highest percentage when compared to all other age groups and 9% of patients (Male 4% and Female 5%) present in the age group of 71–80 years which were considered to be lowest percentage among all age groups, these demographic data reveal the influence of gender and age in disease and prescribing pattern.

Table 2: Distribution of selected risk factors in cardiovascular disease patients and Percentages of drug utilization pattern in cardiovascular disease patients

Risk factors	N	%
Inadequate diet	20	4
Physical inactivity	25	5
Tobacco consumption	90	18
Alcoholics	110	22
Obesity	150	30
Drug utilization pattern		
FDC	75	15
DPS	425	85

During this study, different adjustable risk factors associated with CVDs were also observed in the patients particularly 4% of inadequate diet, 5% of physical inactivity, 18% of tobacco consumption, 22% of alcoholics,

and 30% of obesity. In our study, a total of 75 (15%) of prescribed drugs were found to be FDCs, rest of the drugs 425 (85%) were prescribed as single dose.

Table 3: Commonly prescribed fixed dose combinations in cardiovascular disease patients

Class	Fixed dose combinations	Strength (mg)	%
Antiplatelet drugs	Aspirin+Clopidogrel	75+75	40
ARB/Diuretic	Telmisartan + Hydrochlorothiazide	40+12.5	15
CCB/BB	Amlodipine+Atenolol	5+50	10
ACEI/Diuretic	Ramipril+Hydrochlorothiazide	2.5+12.5	6
ARB/BB	Telmisartan+Metoprolol	40+50	4
ARB/Diuretic	Losartan+Hydrochlorothiazide	50+12.5	3
CCB/ARB	Amlodipine+Losartan	40+5	3
ARB/CCB/Diuretic	Losartan+Amlodipine+Hydrochlorothiazide	50+5+12.5	2
Aspirin + Clopidogrel combination is found to be highly prescribed FDC (40%) among all, next to that Telmisartan + Hydrochlorothiazide (15%) and Amlodipine + Atenolol (10%) were highly prescribed.			

Discussion

The World Health Organization (WHO) reports an estimated 17.9 million people died from cardiovascular disease (CVDs) in 2016, representing 31% of all global deaths, of these deaths 85% are due to heart attack and stroke. [13] The WHO has estimated that the current burden of CVD in India would lose $237 billion from the loss of productivity and spending on health care over a 10-year period 2005–2015, [14] by 2025 deaths from CVDs are predicted to rise to almost 50 million in India. According to the WHO, more than 50% of all medicines are prescribed, dispensed or sold inappropriately, on the other side, 50% of patients take them incorrectly and about one-third of the world's population lacks access to essential medicines. [15]

Based on the results obtained it is found that male patients 60% had high frequency of cardiovascular incidences when compared to female patients 40%. Out of 500 patients, 34% of patients (Male 22% and Female 12%) belong to the age group of 51–60 years which was considered to be highest percentage when compared to all other age groups and 9% of patients (Male 4% and Female 5%) present in the age group of 71–80 years which were considered to be lowest percentage among all age groups, these demographic data reveal the influence of gender and age in disease and prescribing pattern. This was comparable to age-related distribution of CVDs demonstrated in similar studies from Guntur (Andhra Pradesh) [16] and Kattankulathur (Tamil Nadu) [17]; such results strengthen the findings of previous studies that have shown high incidence of CVDs in elderly people.

During this study, different adjustable risk factors associated with CVDs were also observed in the patients particularly 4% of inadequate diet, 5% of physical inactivity, 18% of tobacco consumption, 22% of alcoholics, and 30% of obesity. In our study, a total of 75 (15%) of prescribed drugs were

found to be FDCs, rest of the drugs 425 (85%) were prescribed as single dose. It was found that most of practitioners prefer FDCs, only in certain circumstances and is purely case dependent. FDCs are found to have some advantages such as increasing patient compliance by bring about synergistic action which can reduce the dose of the individual component and adverse effects. On the other hand, rationality of FDCs has become one of the most controversial and debatable issues in general practice. [18] Aspirin + Clopidogrel combination is found to be highly prescribed FDC (40%) among all, next to that Telmisartan + Hydrochlorothiazide (15%) and Amlodipine + Atenolol (10%) were highly prescribed. There are unfortunately no worldwide acceptable criteria to define irrational FDCs and no uniform principles or international standards for their development and regulatory assessment. [19]

Conclusion

Polypharmacy and least use of generic name were observed in the study which may affect the rationality. The use of antiplatelets, statins, and angiotensin-converting enzyme-inhibitors was appropriate, but furosemide overuse is of major concern. Therefore, appropriate prescription writing improvises treatment compliance in the patients, which results in rationality.

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