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Original Research Article

An Observational Assessment of Drug Utilization in Cardiovascular Disease at a Tertiary Care Facility

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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 for the period of 6 months. A total of 200 prescriptions of the patients attending hospital 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 61.5% had high frequency of cardiovascular incidences when compared to female patients 38.5%. Out of 200 patients, 32% of patients belong to the age group of 51–60 years which was considered to be highest percentage when compared to all other age groups and 11% of patients 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 5% of inadequate diet, 6% of physical inactivity, 16% of tobacco consumption, 20% of alcoholics, and 30% of obesity. In our study, a total of 40 (20%) of prescribed drugs were found to be FDCs, rest of the drugs 160 (80%) 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

Drug utilization evaluation (DUE) studies are intended to survey the appropriateness of drug usage. DUE is important to understand that improper use of drugs can have potential risks and additional costs for patients. [1] It is an executive approach used to improve the usage of medications as well as reduce the cost of treatment, ensure drug adequacy, and improve patient safety. [2] 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. [3] 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, [4] 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. [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 in Darbhanga Medical College and Hospital, Darbhanga, Bihar, India for the period of 6 months. A total of 200 prescriptions of the patients attending hospital 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	28	14	20	8
41–50	50	25	35	15
51–60	64	32	40	24
61–70	36	18	18	18
71–80	22	11	10	12
Total	200	100	123	77

Based on the results obtained it is found that male patients 61.5% had high frequency of cardiovascular incidences when compared to female patients 38.5%. Out of 200 patients, 32% of patients belong to the age group of 51–60 years which was considered to be highest percentage when compared to all other age groups and 11% of patients 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	10	5
Physical inactivity	12	6
Tobacco consumption	32	16
Alcoholics	40	20
Obesity	60	30
Drug utilization pattern		
FDC	40	20
DPS	160	80

During this study, different adjustable risk factors associated with CVDs were also observed in the patients particularly 5% of inadequate diet, 6% of physical inactivity, 16% of tobacco consumption, 20% of alcoholics, and 30% of obesity. In our study, a total of 40 (20%) of prescribed drugs were found to be FDCs, rest of the drugs 160 (80%) 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 61.5% had high frequency of cardiovascular incidences when compared to female patients 38.5%. Out of 200 patients, 32% of patients belong to the age group of 51–60 years which was considered to be highest percentage when compared to all other age groups and 11% of patients 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 5% of inadequate diet, 6% of physical inactivity, 16% of tobacco consumption, 20% of alcoholics, and 30% of obesity. In our study, a total of 40 (20%) of prescribed drugs were found to be FDCs, rest of the drugs 160 (80%) 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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