



DRUG UTILIZATION PATTERN IN CARDIOVASCULAR CONDITIONS OF OUTPATIENTS AT A TERTIARY CARE HOSPITAL IN GUJARAT

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ABSTRACT

Background: Despite an alarming rise in prevalence of cardiovascular diseases (CVDs), there is paucity of Indian data in such population from real-world set-ups. Drug Utilization Study (DUS) in government clinical setup is instrumental in developing effective healthcare system of the country. This study was carried out with objectives to study the pattern of usage of drugs in CVDs in patients of Medicine Outpatient Department (MOD), Sir Sayajirao General Hospital, Vadodara and to have information about the trend of CVDs and their correlation with different WHO indicators.

Methods: A cross-sectional, observational DUS was carried out in adult patients of either sex with CVDs. The data were recorded in previously prepared case record form for a period of four months (March 2014 to July 2014). The data were analyzed as per WHO prescribing indicators.

Results: Among 1020 patients, 570 (55.88%) were female and 450 (44.11%) were male. Most of patients (30.49%) belonged to the age-group of 60-69 years. Total 19 CVDs were observed during the study period, with hypertension prevailing in maximum cases (70.88%). Diabetes mellitus was most frequently encountered (21.6%) non-cardiovascular comorbidity. Number of drugs prescribed by brand name was as low as 15 (19.7%) and >80% drugs were prescribed by generic name. Number of drugs per prescription was 6.4.

Conclusion: This study gives an idea of real-world prescribing pattern of CVD drugs among a large population at a tertiary care hospital in Gujarat and gives a comparative description of drug utilization pattern in similar settings across other regions of India.

KEYWORDS : Cardiovascular diseases, drug utilization pattern, hypertension, aspirin

INTRODUCTION:

By the end of 2020, India is predicted to be heart disease capital of the world with estimated rise of 111% in cardiovascular deaths¹. Cardiovascular mortality rates in India are higher than the global average (272 vs. 235 per 1,00,000).² Despite such alarming projections, there is paucity of quality data on cardiovascular diseases (CVDs) in Indian population.³ Drug Utilization Research (DUR), as defined by World Health Organization (WHO), is "the marketing, distribution, prescription and use of drugs in the society, with special emphasis on the resulting medical, social and economic consequences." The principal aim of DUR is to facilitate the rational use of drugs in populations, which implies the prescription of a well-documented drug at an optimal dose, with correct information, at an affordable price.⁴ Drug Utilization Study (DUS) in government clinical setup, a chief healthcare option in developing countries like India, is instrumental in developing effective healthcare system of the country. Drug utilization patterns, when compared between different regions/times, may help generate hypotheses for investigating the reasons for and implications of the differences found.⁵ There is scarcity of data on trends in drugs used for Indian outpatients in cardiovascular conditions. No such significant study was conducted for use of cardiovascular drugs in Medicine Outpatient Department (MOD), Sir Sayajirao General Hospital (SSGH), Vadodara, Gujarat. Hence, we planned to opt for the same.

The objective of this study is to understand the pattern of usage of drugs in CVDs patients of MOD, SSGH, Vadodara and to have information about the trends with CVDs and their correlation with different WHO indicators.

METHODOLOGY:

Study Design:

This was a cross-sectional, observational DUS carried out in the MOD at SSGH, a tertiary care teaching hospital attached to Medical College, Baroda for the period of four months.

Eligibility Criteria:

Patients above the age of 18 years and of either sex, attending MOD for CVDs were included in the study while those not willing to participate for the study were excluded.

Regulatory Approval & Data Collection:

Approval by The Scientific Review Committee and The Institutional Ethical Committee of Human Research, Medical College and SSGH, Baroda, was received before proceeding for the study. The data were recorded in previously prepared case record form (CRF) for a period of four months starting from March 2014 to July 2014.

Data Analysis:

Data were analyzed for the following indicators:

- Age and sex wise distribution of CVDs
- Average number of drugs per prescription (DPP)
- The most common CVD encountered
- Percentage of drugs prescribed from the National List of Essential Medicines (NLEM)
- Percentage of drugs prescribed by brand- and generic names
- Percentage of drugs prescribed from in-pharmacy and out-pharmacy
- Percentage of fixed dose combinations prescribed
- Quantification of drug utilization in terms of Defined Daily Dose (DDD) values and the prescribing prevalence

RESULTS:

Demographics:

Data of 1020 patients with cardiovascular conditions were collected in this study; of these, 570 (55.88%) were female and 450 (44.11%) were male (figure 1). The maximum number of patients (311, 30.49%) belonged to the age-group of 60-69 years (observed range: 20-99 years).

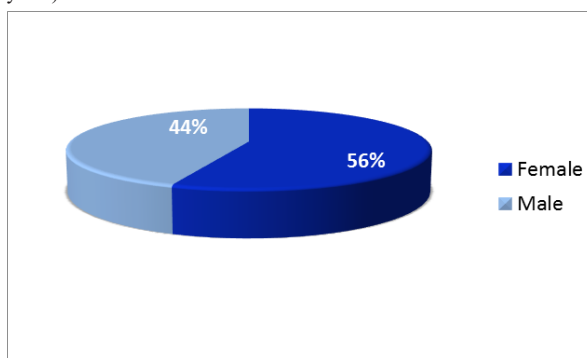


Figure-1: Sex-wise Distribution Of Study Population

Prevalence Of Cardiovascular Conditions:

Total 19 CVDs were observed during the study period. As shown in figure 2, hypertension prevailed in maximum cases – 723 out of 1020 (70.88%). Among the non-cardiovascular comorbidities, diabetes mellitus was the most frequently encountered condition, prevailing in 221 (21.6%) patients.

Prescribing Pattern:

As seen in table 1, of the 76 drugs prescribed among 1020 prescriptions, only 26 (34.2%) were from NLEM. Number of drugs prescribed by brand name was as low as 15 (19.7%) and >80%, i.e., 61 drugs were prescribed by generic name. >78% of drugs were

prescribed from out-pharmacy at one or the other time. 6529 drugs were prescribed amid 1020 prescriptions, averaging to 6.4 DPP. Merely 4 fixed dosed combinations were encountered out of total 76 drugs prescribed.

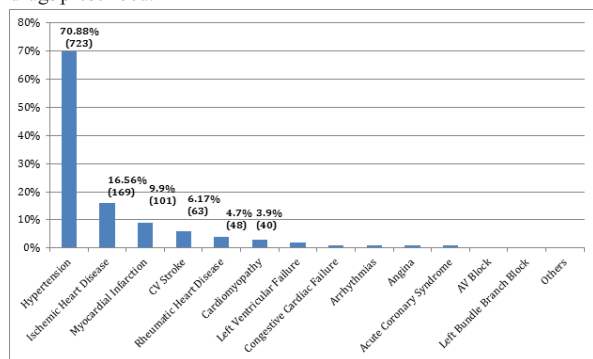


Figure-1: Prevalence Of CVDs Amongst Study Population

Table-1: Utilization Pattern

Parameter	Finding
Total drugs prescribed	6529
Drugs per prescription	6.4
Drug items prescribed	76
Number of fixed dose combinations prescribed	4 (5.2%)
Drugs prescribed from NLEM	26 (34.2%)
Number of drugs prescribed by brand name	15 (19.7%)
Number of drugs prescribed by generic name	61 (80%)
Number of drugs prescribed from out-pharmacy	59 (78%)

Quantification of drug utilization pattern in terms of Defined Daily Dose (DDD) as well as Prescribed Daily Dose (PDD) values can be seen in table 2 and the Anatomic Therapeutic Classification (ATC) of the most commonly prescribed drugs can be seen in table 3.

Table 2: DDD And PDD Values Of Most Commonly Prescribed Cardiovascular Drug

Name of Drug	PDD (mg)	DDD (mg)	DDD/1000 Patients/Day
Enalapril	5.95	20	552.28
Atorvastatin	28.99	10	254.41
Isosorbide dinitrate	3.9	60	20.13
Amlodipine	7.8	5	324.09
Furosemide	60.53	40	199.89
Clopidogrel	74.4	75	132.38
Metoprolol	46.2	150	27.75
Atenolol	63.26	75	65.18

Table-3: ATC Classification Of The Most Commonly Prescribed Drugs:

Name of Drug	ATC Code
Enalapril	C09AA02
Atorvastatin	C10AA05
Isosorbide dinitrate	C01DA08
Amlodipine	C08CA01
Furosemide	C03CA01
Clopidogrel	B01AC04
Metoprolol	C07AB52
Atenolol	C07AB03
Digoxin	C01AA05
Carvedilol	C07AG02

DISCUSSION:

Prescribing Pattern:

Despite DUR being vital for healthcare policy-making at national- and at individual patient management levels there is inadequacy of information on drug consumption in most of the middle or low income countries. DDD, a technical unit of measurement, is “the assumed average maintenance dose per day for a drug used for its main indication in adults” while ATC is the global standard for classifying drugs. The ATC/DDD system serves as tool for DUR and allows comparison of drug consumption statistics at international and other levels of healthcare.⁵ Knowledge of the PDDs, on the other hand, is necessary for clinical interpretation of gathered data. In this study, we used DDD per 1000 inhabitants per day as the indicator of drug

consumption. This can serve as a baseline data for comparison with similar studies in future and can help identify any changes in the trend of drug consumption over time. As shown in table-2, number of DDD for enalapril (5 mg), atorvastatin (20 mg) and amlodipine (5 mg) tablets were 552.28, 254.41 and 324.09, respectively, indicating high consumption of these drugs by patients in this setup. ADUS conducted in 400 geriatric CVDs patients at a tertiary care hospital of Karamsad (Gujarat) showed quite lower numbers of DDDs for these drugs (32.5 for atorvastatin and 86 for amlodipine).⁶

Age-Sex Interaction:

Proportion of female patients was reported higher (55%) in this study as compared to similar studies conducted at northeastern (33%)⁷ and south Indian states (32%).⁸ >50% of our study population belonged to age group of 50-69 years [60-69 years (30.5%) and 50-59 years (28%)]. This is comparable to age-related distribution of CVDs demonstrated in similar studies from Guntur (Andhra Pradesh)⁸ and Kattankulathur (Tamil Nadu)⁹; such results strengthen the findings of previous studies that have shown high incidence of CVDs in elderly people.

Incidence Of Polypharmacy:

In this study, average number of DPP was 6.4 – comparable to (7) and higher than (3.4) that reported in similar studies carried out at cardiac outpatient set-ups in Kattankulathur⁷ and Mumbai (Maharashtra), respectively¹⁰. Though considered as polypharmacy, such high number of DPP for chronic clinical conditions, like hypertension and diabetes, can be acceptable and is also directed by WHO.¹¹

Incidence Of Prescribing By Drug Nomenclature:

In our study, > 80% drugs were prescribed by generic name, which is appreciable over 60%, 6.2% and 5.9% drugs being prescribed by generic names as seen in similar studies from Miraj (Maharashtra)¹², Mumbai¹⁰ and Guntur⁸, respectively. Another significant finding of our study was overutilization of iron, calcium and vitamin supplements that were prescribed in almost all prescriptions – not necessarily required in each of them. Such misuse may add up to the economic burden to healthcare centre. Special attention needs to be drawn to the use of aspirin which was prescribed, in most cases, at higher dose range (150-325 mg/day) than that recommended in conditions like MI or LVF (75-150 mg/day).¹³

Co-morbid Conditions:

Diabetes was the commonest comorbidity with CVDs in this study population. Advanced age, obesity, poor diet, lower economic conditions and concomitant chronic diseases are assumed to be the causative risk factors for the occurrence of diabetes, which prevailed in 21.6% (221) patients. This further confirms the evidences from clinical trials that claim diabetes to be an independent risk factor for CVD and treating later reduces mortality rates in patients with comorbid diabetes.⁷

CONCLUSION:

DUSs are powerful exploratory tools to ascertain the role of drugs in society by increasing our understanding of how drugs are being used. Results of the present study provide basic information about the drug utilization pattern being practiced by the prescribers at this tertiary care hospital in the treatment of cardiovascular conditions. On the whole, the data represent a frame of picture of cardiovascular conditions prevailing among major adult, lower-income, rural population of Vadodara region and their correlation to sex and age characteristics. This study gives an idea of treatment measures being conducted for this population and the details like DDD numbers, PDD values, percentage of drugs provided from in-pharmacy and average number of drugs being used. We also cover a comparative description of drug utilization pattern in similar settings across other regions of India. Results of this study can be compared and/or analyzed further to make the therapeutic approach more efficient. It can be used to estimate the number of patients exposed to specified drugs within a given time period and also describe the extent of use at a certain moment and/or in a certain area (e.g. in a country, region, community or hospital). Such descriptions are most meaningful when they form part of a continuous evaluation system, i.e. when the patterns are followed over time and trends in drug use can be discerned. It can be used to compare the observed patterns of drug use for the treatment of a certain disease with current recommendations or guidelines.

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Conflict Of Interest: None

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