ORIGINAL RESEARCH PAPER

Chemistry

PRESCRIBING PATTERN OF DRUGS FOR CARDIOVASCULAR CO-MORBIDITIES IN TYPE 2 DIABETES MELLITUS PATIENTS IN A TERTIARY CARE HOSPITAL

KEY WORDS: Diabetics, Drug-drug interaction, prescribing pattern, cardiovascular diseases,

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ABSTRACT

Objective: analyze the prescription pattern of drugs used in cardiovascular co-morbid conditions in type 2 DM
Method: A prospective observational study. 184 patients, Case of HTN with DM.
Result: Total numbers of prescriptions with β-blockers 34.28 % prescriptions are carvidiol followed by the 45.72 % of Metoprolol and 20% of Nebivolol. Out of 183 cases, 97 drug interactions were found.
Conclusion: study emphasizes the need of Effective strategies, regular monitoring must be implemented to improve the patient compliance and achieve a better outcome.

INTRODUCTION

Prescribing pattern study is a powerful exploratory tool to evaluate present trends of drug use and appropriateness of prescriptions. It is a descriptive and analytical method of collection, quantification, understanding and evaluation of the prescribing pattern, as well as dispensing and consumption for the advancement of existing therapy and enhancement of patient safety [1].

Now a day's inappropriate drug use is a common hurdle which receives the support of numerous worldwide research studies to determine the safe and effective drug utilization.[2,3] Cardiovascular diseases (CVDs) take the lives of 17.7 million people every year, 31% of all global deaths. Triggering these diseases – which manifest primarily as heart attacks and strokes – are tobacco use, unhealthy diet, physical inactivity and the harmful use of alcohol. These in turn show up in people as raised blood pressure, elevated blood glucose and overweight and obesity, risks detrimental to good heart health. More than all communicable, maternal, neonatal and nutritional disorders combined, and double the number of deaths caused by cancers.[4] It was reported that by 2017 approximately 80% of all CVD deaths are due to heart attacks and strokes. [5,6]

In 2017, an estimated 8.8 percent of the adult population worldwide had diabetes. This figure is projected to rise to 9.9 percent by the year 2045.which results in chronic complications including micro vascular and macro vascular disorders.[7] Correct diagnosis, accurate prescribing, proper dispensing, appropriate packing and good patient counseling are the important criteria for rational use of drugs.[8] Also increases the incidence of undesirable drug reactions. These studies are rising globally in different healthcare settings; provide enormous medical, social and economic significance.

OBJECTIVES:

1. There are many variations in prescribing patterns of Diabetes mellitus with hypertension which requires lifelong treatment as enormously increased the burden of chronic diseases and needs much care while choosing drugs.

2. In a tertiary care Centre, prescribing pattern are powerful tools to ascertain the role of drugs in society. Hence, there is a need for appropriate, safe, effective study to find out the patterns of drug therapy among diabetic hypertensive patients with other complications.

METHODOLOGY

The intended work can be divided into the following steps.

Step 1: To collect randomly the prescriptions of patients diagnosed cardiovascular drugs with diabetes.

Step 2: To separate the prescriptions prescribing cardiovascular drugs with Anti Diabetic Drugs and the ones without anti diabetic drugs.

Step 3: To divide the prescriptions into various groups according tothe following: Age and sex of patient and diseases associated cardiovascular Diseaseswith DM.

Step 4: To statistically analyze the prescriptions on the followingaspects: Demographic characters of patients.

- Showing incidence of cardiovascular Diseases with DM according to sex.
- Showing incidence of cardiovascular Diseases with DM according to different age groups.
- Analysis of Prescription in cardiovascular Diseases with DM with respect to dosage forms.
- Analysis of prescription showing incidence with other diseases. Patterns of utilization of major Pharmacological drug classes.

Step 5: To analyze the frequency of diseases associated with cardiovascular Diseases DM statistically and the drugs according to their pharmacological categories.

Study procedure:

The study teams visits the study site on regular basis and selects the patients according to the study criteria, then take the verbal consent from patient, the necessary data is collected from the patient and their patient profile forms and medication chart in a designed data collection form.

Selection of subjects:

The patients or the subjects were selected or taken into this study according to the following inclusion and exclusion criteria.

INCLUSION CRITERIA:

- Patients of both sexes irrespective of age.
- Patients diagnosed cardiovascular Diseases with Diabetes Mellitus.
- Patients Diabeteswith cardiovascular Diseases along with other co- morbidities was selected.
- Patients with DM on treatment with oral hypoglycemic agents and insulin therapy.
- Laboratory investigations.
- Diabetic patients having co-morbidity of hypertension other and cardiovascular Diseasesare included

Exclusion Criteria:

Patients without Diabetes mellitus and other ambulatory conditions such as poisoning and accident cases were excluded from study.

- Pediatric patients were also excluded from study.
- Patients with Gestational Diabetes are also excluded from study.
- Patients visiting out-patient departments with or without Diabetes Mellitus are also excluded from the study.

Study design:
A prospective observational study is conducted in the inpatients admitted to cardiovascular Diseases with Diabetes in the hospital.

Study population:
The study group consists of 184 patients, both male and female diagnosed with Diabetes and diabetes with other co-morbid conditions, admitted in a Sudha Multispeciality Hospital in Erode

Study duration:
The study was carried out for 6 months from 2017 December to May 2017.

Source of data:
All the relevant and necessary data for the study was collected from the patient profile forms, patient medication charts, and interviewing patients and health care professionals in a form that is suitable for the study.

RESULTS AND DISCUSSION

The drug prescribing pattern study is conducting widely and it is being carried out in different healthcare setups. Such studies are helpful to determine the behavior of the use of medicines in a society. A survey based on prescription is considered to be one of the most cost effective methods to determine the prescribing approach of physicians. Among adult population the first and third leading death reasons is the heart disease and stroke.

On analysis, majority of patients were in the age range of 41-50 (44.23%) of peoples shown in Diabetic and 51-60 age range of peoples are mostly concerned with cardiac disease (28%)

Table 1 : Age groups of the patients(n=184)

Age groups (in years)	Diabetic population			Cardiac population			Diabetic percentage(%)	Cardiac percentage(%)
	Male	Female	Total	male	Female	Total		
10-20	06	02	08	03	01	04	8.45	4.49
21-30	04	01	05	05	03	08	5.26	8.98
31-40	12	10	22	12	04	16	22.16	17.9
41-50	39	04	42	05	04	09	44.23	10.11
51-60	06	03	09	22	03	25	9.47	28
61-70	04	02	06	15	09	24	6.32	26.9
≥70	02	01	03	02	01	03	3.15	3.37

Table 2: Distribution of co-morbidities in the study population

Co-morbidities	No. of patients	Percentage (%)
One	56	62.92
Two	09	10.11
Three	01	1.12
Without co-morbidities	23	25.84

Table 2 Shows that the distribution of co-morbidities in the study population. In our study exists in 66 patients with co-morbidities out of 89 patients. Patients without co-morbidities were found to be (23) 25.84%. One Co-morbidity was 62.92% (56), two co-morbidities.

Table NO. 3 : Distribution pattern of overall cardiovascular drug therapy

SL.NO:	Drug category	No. of drugs	Percentage (%)
1.	Antiplatelet, anticoagulants &Fibrinolytics	102	18.4
2.	Antianginal drugs	37	6.7
3.	Diuretics	74	13.4
4.	Antiarrhythmic drugs	29	5.25
5.	Dyslipidemic agents	63	11.41
6.	Cardiac glycosides	07	1.26
7.	β- blockers	73	13.22
8.	ACE inhibitors / direct renin inhibitors	61	11.48
9.	Angiotensis !!Antogonist	58	10.50
10.	Calcium channel blockers	24	4.34
11.	α- blockers	10	1.51
12.	Others	14	2.53
	Total	552	100

Table 3 observed that distribution pattern of cardiovascular drug therapy. Among these 18.4% (102) were Anti platelet, anticoagulants and Fibrinolytics followed by 6.7 % (37) of Anti-anginal Drugs, 13.4 % (74) of Diuretics, 5.25% (29) of Anti-arrhythmic drugs, and 11.41 % (63) of Dyslipidemic agents, 1.26 % (7) of cardiac glycosides.

Table No. 4 : Distribution of ten most potential drug - drug interactions

SL.NO.	Drug Combination	Level of severity	Mechanism	Frequency
1.	Atorvastatin + Clopidogrel	Moderate	Pharmacokinetic	43
2.	ACE inhibitors + Aspirin	Moderate	Pharmacodynamic	42
3.	Digoxin + Atorvastatin	Moderate	Unknown	39
4.	Digoxin + Furosemide	Moderate	Pharmacokinetic	37
5.	Aspirin + - Enoxaparin	Moderate	Pharmacodynamic	22
6.	Insulin + Timolol	Moderate	Unknown	20
7.	Enoxaparin + Eptifibrate	Major	Unknown	16
8.	Enoxaparin + Clopidogrel	Major	Pharmacodynamic	12
9.	Clopidogrel + Prasugrel	Major	Pharmacodynamic	8
10.	Aspirin + Nebivolol	Minor	Unknown	2

The potential drug - drug interactions identified from the prescriptions were listed in the above table. The most frequently occurred were those with Atorvastin+ Clopidogrel (43) with moderate severity and pharmacokinetic Mechanism, ACE inhibitors + Aspirin (42) with moderate severity and pharmacokinetic Mechanism and enoxaparin + eptifibatide (16) with moderate severity and Unknown mechanism and Aspirin+ Nebivolol (2) with minor severity.

SUMMARY AND CONCLUSION:

Prescription analysis helps to improve the rational use of drugs. It helps in knowing the errors and improper prescribing, major problem identified in hospitals these days. It also helps us to provide advantageous feedback to prescribers in order to improve their prescribing behavior.

Today in the evolving world we can clearly observe a crowning phenomenon of increased health risks. There is a similar growth in the case of cardiovascular related diseases. Increasing age, random changes in lifestyle, lack of physical activities, increased stress, work load, smoking like habits have been providing a path to more morbidity and mortality due to cardiovascular disorders.

In the present study, the prescribing pattern of drugs in cardiovascular system was assessed. Drug-drug interaction is a trouble maker in management of CVDs as it requires multiple therapies. Out of 123 cases, 97 drug interactions were found. Effective strategies, regular monitoring must be implemented to improve the patient compliance and achieve a better outcome.

This study necessitates the need to develop and use a standardized ideal format for all prescription. Thereby we canto, an extent, reduces of chance of medication Errors.

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