IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

Prescribing Pattern of Drugs for Cardiovascular Co-morbidities in Diabetes Mellitus Patients: A Cross Sectional Study in a Tertiary Care Hospital in Mandya

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ABSTRACT:

Diabetes mellitus is defined as a chronic metabolic disorder that occurs due to impaired insulin secretion resistance which is marked by continuous hyperglycaemia. The risk of cardiovascular disease mortality among Diabetes Mellitus patient is 1.7 times higher than non-diabetic patients. Among the patients having Diabetes mellitus, approximately 32.2% are having cardiovascular disease. Our objective is to describe the prescription pattern of drugs for cardiovascular co-morbidities among the patients with Diabetes Mellitus in tertiary care hospital Mandya. A Cross sectional study was conducted with 155 subjects having Cardiovascular Co-morbidities with Diabetes mellitus. Data needed for the study was collected using patients case sheet related to the study were collected from the case sheet, lab reports, treatment chart, using a pretested semi-structured proforma. The final result was determined using Basic statistical analysis. Among study population of 155 patients, demographic shown 53% were male and 47% were female. The most affected age group was 60-69 years. Hypertension and IHD along with hypertension were most observed cardiovascular comorbidities. Most prescribed class of drug for diabetes were Insulin, biguanides and combined antidiabetic drugs. Most prescribed class of drugs for cardiovascular co-morbidities were Antiplatelet, ACE inhibitors, Diuretics, lipid lowering agent and calcium channel blockers. The prescribing habits of medications for the cardiovascular system were examined in the current investigation. To increase the patient's compliance and get better results, effective tactics and consistent monitoring must be used. A uniform ideal format for every prescription must be created and used as a result of this study. Thus, the likelihood of drug errors can be reduced.

KEY WORDS: Cardiovascular Co-morbidities, Type 2 Diabetes mellitus, Prescribing pattern, hypertension,

INTRODUCTION:

Diabetes mellitus (DM) is a group of metabolic disorder in which there is high blood sugar levels for long period of time. This high blood sugar produces the symptoms of frequent micturition, excessive thirst, and hyperphagia. Diabetes if untreated, leads to many complications such as diabetic ketoacidosis and nonketotic hyperosmolar coma. Serious long-term complications include heart disease, stroke. [1]

India currently has over 33 million diabetics, and by 2030, there should be 79.4 million of them. According to data from the International Diabetes Federation, India has a 7.1% adult prevalence of diabetes. In 2020, 9% of cases will occur in urban areas. [2]

Diabetic patients with cardiovascular disease more likely die than patients without the condition. Worldwide around 32.2% of people having Diabetes are prone to cardiovascular disease.[3]

Cardiovascular disease in Diabetes mellitus increases the mortality and morbidity than non-diabetics in this population. In comparison to those without Diabetes Mellitus, those with Diabetes Mellitus have more extensive and much early process of accelerated atherosclerosis, more brittle and substantial atherosclerotic plaques, and smaller in diameter coronary artery lumens. [4]

Appropriate treatment approach is necessary to reduce the CV events in the future. Improved CV outcomes can be achieved with therapy that aims to change these risk factors, but doing so can be difficult. The recommendations frequently alter or diverge depending on what body publishes them, and the criteria for these risk factors typically differ from the guidelines for non-diabetic individuals.

The analysis of prescribing patterns is a part of medical audit that monitors and evaluates prescribers and makes recommendations for necessary changes to promote reasonable and economical medical treatment. The use of the fewest amount of medications to achieve the best outcome in the quickest time frame and at the most affordable price is referred to as rational drug prescribing. The analysis of prescribing trends aids in the monitoring, assessment, and, if necessary, suggestion of changes to prescribing trends for more rational and cost-effective medical care.[5]

MATERIAL AND METHOD:

Study Design: cross sectional Study.

Study Period: 6 months from getting approval from the ethics committee (May to october)

Study Population: Patients who were treated for cardiovascular co-morbidities among type 2 diabetic patients in general medicine department.

Sample Size: 155 patients

Formula = $4pq/L^2$

p=32.2% [3], Where p=Global prevalence of cardiovascular complications among Type2 diabetes mellitus patients q=100-p, L= 7.5%

q=67.8

Calculation

$4\times(32.2)67.8/7.5^2 = 155$

Sampling Method: Convenience sampling.

Inclusion Criteria:

1. Patient above 30 years of age admitted in the medicine ward of MIMS Mandya; Diagnosed with Diabetes mellitus with cardiovascular complication like Diabetic cardiomyopathy, Atherosclerosis, Coronary artery disease, Ischemic heart disease, Hypertension, Peripheral artery disease, Stroke, Heart failure.

Exclusion Criteria:

1. Patient who are pregnant and lactating.

Method of Data Collection (study tools):

The Diabetes Mellitus patients with cardiovascular co-morbidities shall be recruited as per the inclusion and exclusion criteria. All the data related to this study will be collected from the case sheet, lab reports, treatment chart, using a pretested semi-structured proforma. It shall consist of 2 parts. The first part regarding the demographics, details and social habits and details on cardiovascular complication in Diabetes Mellitus patients, The second part regarding the treatment of cardiovascular complications among Diabetes Mellitus patients.

Analysis: The obtained cases will be thoroughly analysed and evaluate the pattern of drugs prescribed in cardiovascular complications among Diabetes Mellitus patients. The final result will be determined using basic statistical analysis.

RESULT:

A total of 155 subjects were enrolled in the study among which 81 were males and 74 were females (table no.1)

Patients Demographics Characteristics

Table 1: Patients Demographics Characteristics

Characters	No. of Patients
Age (Mean±SD)	60.7±12.6
Gender	
Male	81
Female	74
Social History	
Smokers	07
Alcoholic	21
Smoker and alcoholic	36

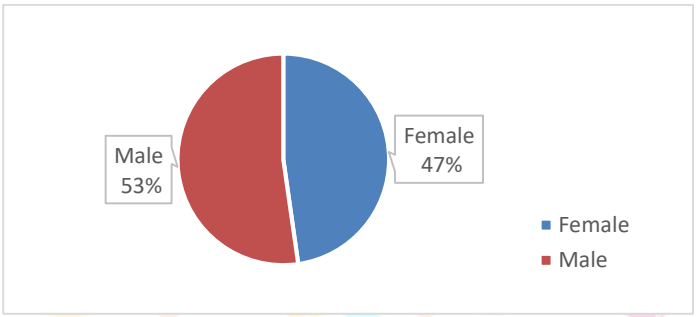

Figure 1: Distribution of patients based on gender

Distribution of patient Based on Age group

All the patients were divided into 6 groups based on their age. The maximum number of patients was found in the age group of 60-69 and the minimum number of patients were found in the age group of 30-39 years.

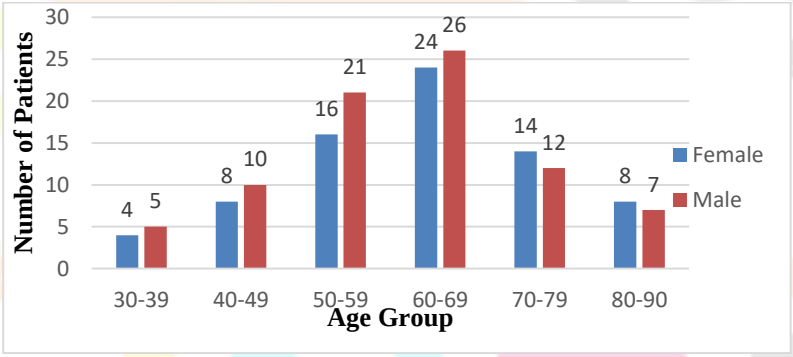

Figure 2: Distribution of patient based on age group

Distribution of patients based on Cardiovascular comorbidities of Diabetes mellitus.

Among the study population of 155 patients 5 patients had ACS-NSTEMI, 1 patient had CCF, 1 patient had HHD, 87 patients had HTN, 6 patients had IHD, 1 patient had Acute heart failure, 1 patient had Atrioventricular block. In the study population 8 patients had both ACS-NSTEMI and HTN, 1 patient had both Acute wall MI and HTN, 4 patients had both HHD and HTN, 1 patient had both HTN and Atrial fibrillation, 2 patients had both HTN and CCF, 1 patient had both HTN and Unstable angina, 25 patients had both IHD with HTN, 2 patients had both IHD with LV dysfunction, 1 patient had ACS-NSTEMI with HTN with IHD, 1 patient had CCF with IHD with HTN, 5 patients had HTN with IHD with LV dysfunction, 1 patient had IHD with LV dysfunction with ACS-NSTEMI, 1 patient had IHD with HTN with HHD.

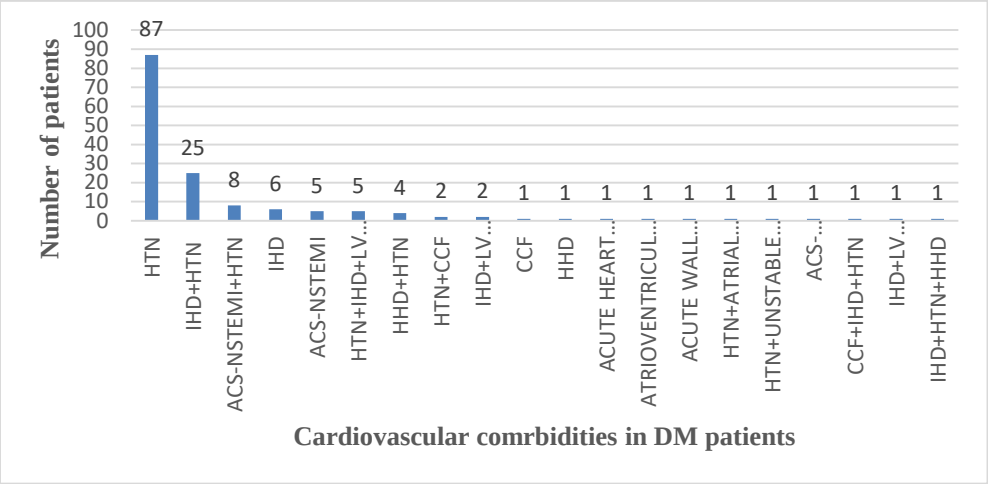

Figure 3: Distribution of patient based on Cardiovascular comorbidities of DM.

Distribution of Patient Based on Social history

In this study, among 155 patients, 21 (13.5%) patients were alcoholic,07 (4.5%) patients were smoker, 36 (23.2%) patients were both alcoholic and smoker and 91 (58.7%) patients were having no habits.

Table 2: Distribution based on social history

Social history	Number of patients	percentage
Smokers	07	4.5%
Alcoholic	21	13.5%
Alcoholic and Smoker	36	23.2%
Nil	91	58.7%

Prescribing patterns of drugs used for Diabetes mellitus among the study population

A total of 169 drugs were prescribed for Diabetes mellitus in 155 patients evaluated in the study. For simplification, we have divided the drugs that were prescribed for Diabetes mellitus into 08 categories. Among 169 drugs 51 drugs were Insulin, 66 drugs were Metformin, 3 drugs were Pioglitazine, 1 drug was Voglibose, 2 drugs were Dapagliflozin, 4 were DPP-4 class, 2 were Sulfonyl urea class, 40 were combination drugs.

Table 3: Prescribing patterns of drugs used for Diabetes mellitus among the study population.

Class of Drugs	Drugs	Numbers	Total number	Percentage
1.Insulin	Actrapid	37	51	30.18%
	Mixtard	14		
2.Biguanides	Metformin	66	66	39.05%
3.Thiazolidinedione	Pioglitazone	3	3	1.78%
4.Alfa-glucosidase inhibitor	Voglibose	1	1	0.59%
5.SGLT-2 inhibitor	Dapagliflozin	2	2	1.18%
6. DPP-4	Sitagliptin	1	4	2.37%
	Teneligliptin	3		
7. Sulfonyl urea	Gliclazide	1	2	1.18%
	Glimepiride	1		
8. Combination drugs	Metformin + Glimepiride	32	40	23.67%
	Metformin + voglibose	1		
	Vildagliptin + Metformin	2		
	Metformin + Glimepiride + Pioglitazone	3		
	Glipalamide + Metformin	1		
	Vildagliptin + Dapagliflozin	1		

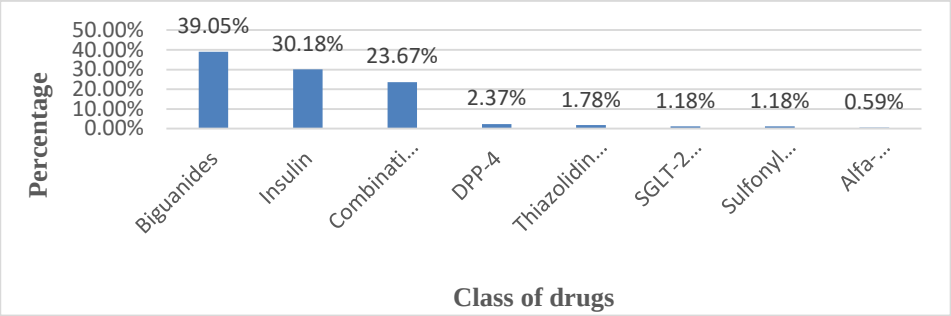

Figure 4: Prescribing patterns of drugs used for Diabetes mellitus among the study population.

Prescribing patterns of drugs used for Cardiovascular comorbidities in Diabetes mellitus among the study population.

A total of 436 drugs were prescribed for Cardiovascular Co-morbidities in 155 patients evaluated in the study. For simplification, we have divided the drugs that were prescribed for Cardiovascular Co-morbidities into 14 categories. Among 436 drugs 52 drugs were CCB, 64 drugs were Diuretics, 24 drugs were Beta blockers, 1 drug was Alfa blocker, 6 drugs were Alfa + Beta blockers, 66 were ACE inhibitors class, 12 were ARB class, 2 drugs were Vasodilators, 59 drugs were Lipid lowering agents, 19 drugs were Anti-Coagulants, 117 drugs were Antiplatelet class, 1 drug was Nitrates class, 9 drugs were combination drugs and 4 were other drugs.

Table 4: Prescribing patterns of drugs used for Cardiovascular comorbidities in Diabetes mellitus among the study population.

Class of Drugs	Drugs	Number	Total numbers	Total Percentage
1. CCB	Amlodipine	47	52	11.93%
	Cilnidipine	3		
	Nifedipine	1		
	Diltiazem	1		
2. Diuretics	Furosemide	47	64	14.68%
	Spironolactone	4		
	Mannitol	12		
	Metolazone	1		
3. Beta blockers	Propranolol	6	24	5.50%
	Metoprolol	12		
	Atenolol	4		
	Bisoprolol	2		
4. Alfa blockers	Prazosin	1	1	0.23%
5. Alfa + Beta blockers	Labetalol	3	6	1.38%
	Carvedilol	3		
6. ACE inhibitor	Enalapril	61	66	15.14%
	Ramipril	5		
7. ARB's	Telmisartan	12	12	2.75%
8. Vasodilators	Isolazine	1	2	0.46%
	Nitro-glycerine	1		
9. lipid lowering agents	Atorvastatin	59	59	13.53%
10. Anti - Coagulants	Dabigatran	1	19	4.36%
	LMWH	14		
	Vitamin K	1		
	Tranexamic acid	2		
	Unfractionated Heparin	1		
11. Antiplatelet	Aspirin	64	117	26.83%
	Clopidogrel	52		
	Ticagrelor	1		
12. Nitrates	Sor bitrates	1	1	0.23%
13. Combination drugs	Telmisartan + Amlodipine	2	9	2.06%
	Telmisartan + Hydrochlorothiazide	3		
	Atorvastatin + Aspirin	1		
	Metoprolol + Ramipril	1		
	Telmisartan + amlodipine + hydrochlorothiazide	1		
	Clopidogrel + Aspirin	1		
14. Others classes of drug	Monotrate	1	4	0.92%
	Nicorandil	1		
	Nor- adrenaline	1		
	Ranolazine	1		

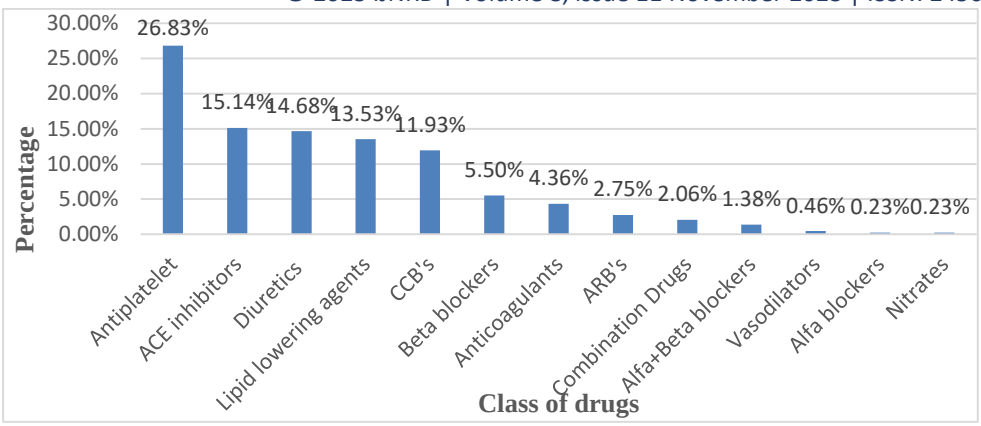

Figure 5: Prescribing patterns of drugs used for Cardiovascular comorbidities in Diabetes mellitus among the study population

DISCUSSIONS:

The most common cardiovascular Co-Morbid conditions of DM were Hypertension and IHD along with Hypertension. whereas Dakshina Murthy Nishanthini, et.al (2014) carried out a similar study in which they found much the same. [6]

Most prescribed class of drug for diabetes were Insulin, biguanides and combined antidiabetic drugs. Most prescribed class of drugs for cardiovascular co-morbidities were Antiplatelet, ACE inhibitors, Diuretics, lipid lowering agent and calcium channel blockers.

CONCLUSION:

In the present study, we observed the pattern of co-morbid conditions, pattern of drug use in patient with Diabetes mellitus and Cardiovascular Co-morbidities. Among the 155 patients whose data were collected over the course of the trial, 81 (53%) were men and 74 (47%), women. Ages 60 to 69 were the most affected age group.

Our study found that the three most common comorbidities of DM were hypertension (56%) together with IHD and hypertension (16%) and ACS-NSTEMI along with hypertension (5%). The two drug classes most frequently administered for DM were biguanides (39%) and insulin (30%). In addition, the medications most frequently prescribed for DM cardiovascular comorbidities included antiplatelets (27%) ACE inhibitors (15%), diuretics (15%), and diuretics. The prescribing habits of medications for the cardiovascular system were examined in the current investigation. To increase the patient's compliance and get better results, effective tactics and consistent monitoring must be used. A uniform ideal format for every prescription must be created and used as a result of this study. Thus, the likelihood of drug errors can be reduced.

CONFLICT OF INTEREST:

Concerning this inquiry, the authors have no conflicts of interest.

ACKNOWLEDGMENTS:

We gratefully acknowledge the assistance from Mandya Institute of Medical Science, Government tertiary care hospital.

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