

# Prescription Pattern of Cardiovascular Disorders in Type II DM Patients in a Tertiary Care Hospital

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## Abstract:-

### ➤ Aim

The aim of this study is to determine the prescription pattern of cardiovascular disorders in type 2 diabetes mellitus patients in a tertiary care hospital.

### ➤ Methodology

The prospective observational study was conducted in tertiary care teaching hospital for 6 months. Prescribing pattern of 190 inpatients was analysed who were diagnosed with cardiovascular disorders and DM and the data were collected in a specially designed performa. Microsoft excel and graph pad prism version was used to analyse the data and it was expressed as mean  $\pm$  S.D (standard Deviation).

### ➤ Result

Total number of cardiovascular drugs was found to be 946. The prescription rate of antiplatelets, anticoagulants and fibrinolytics were 26 %, followed by 17 % of antianginal drugs, 10% of Diuretics, 23% of dyslipidemic agents, 13% of beta blockers, 3% of ACE inhibitors, 3% of ARB, 4% of CCB. A total of 213 Antidiabetic drugs were used, in which 42.3% were Metformin.

### ➤ Conclusion

The present study concluded that most of the drugs were prescribed rationally according to the standard treatment guidelines. The potential drug interactions were more in the cardiovascular drugs prescriptions.

**Keywords:-** Cardiovascular Diseases (CVD), Diabetes Mellitus (DM), Prescription Pattern, and Drug - Drug Interactions.

## I. INTRODUCTION

Cardiovascular diseases (CVDs) are major health problem throughout the world and common cause of premature morbidity and mortality. Today CVD accounts for approximately 30% deaths worldwide including nearly 40% in high income countries and about 28% in middle and low income countries.<sup>1</sup> The important risk factors for CVD are industrialization, urbanization and associated lifestyle changes leads to increased prevalence of obesity, Type - II Diabetes mellitus (DM) and metabolic syndrome.<sup>2</sup>

The study of prescribing pattern is a component of medical audit that does monitoring and evaluation of the prescribers as well as recommends necessary modifications to achieve rational and cost-effective medical care.<sup>3</sup> Rational drug prescribing is defined as the use of the least number of drugs to obtain the best possible effect in the shortest period and at a reasonable cost. The study of prescribing patterns helps to monitor, evaluate and if necessary, suggest modifications in prescribing patterns so as to make medical care rational and cost effective.<sup>4</sup>

## II. MATERIALS AND METHODS

The study was conducted at General Medicine Department of 300 bedded multispecialty tertiary care teaching hospital. Out of 230 patients screened, 190 patients were included in the study population based on following inclusion and exclusion criteria after obtaining informed consent. Patients diagnosed with cardiovascular disorders having type 2 DM. A specially designed data entry form was used to collect demographic details. Microsoft excel 2007 version were used to analyse the data and it was expressed as Mean  $\pm$  S.D (Standard Deviation).

## III. RESULT

A total of 190 cardiac patients with type 2 DM were enrolled in the general medicine department. Total number of cardiovascular drugs was found to be 946. The prescription rate of antiplatelets, anticoagulants and fibrinolytics were 26 %, 23% of dyslipidemic agents, 13% of beta blockers, 3% of ACE inhibitors, 3% of ARB, 4% of CCB. A total of 213 Antidiabetic drugs were prescribed and 42.3% were Metformin.

### A. Age Distribution

Age wise distribution shows that in every age category except for 81-90 years male dominates the female in having cardiovascular diseases. Most of the male patients diagnosed with cardiovascular diseases were of the age group 61-70 years (49) followed by 51-60 years (46). The peak age group for females having cardiovascular diseases was 51-60 years (17) followed by 61-70 years (14) [Figure. 1].

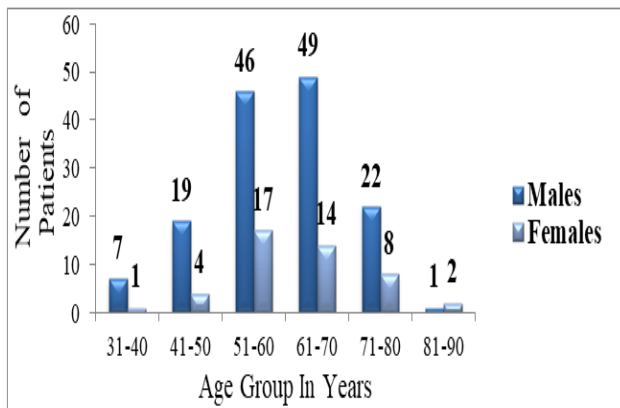


Fig 1:- Age wise distribution (n=190)

**B. Gender Wise Distribution**

A total of 190 patients met the inclusion criteria of the study. Out of these 190 patients, males were 76% (144) and females were 24% (46) in number [Figure. 2].

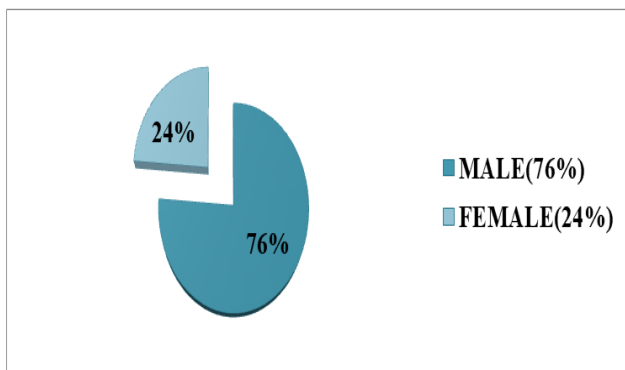


Fig 2:- Gender Wise Distribution of Patients (n=190)

**C. Comorbid Conditions among CVD Patients**

Out of 190 patients, 92 patients had co-morbid conditions that is, total of 48.4%. Out of all the co morbidities observed, HTN 23.6% (45) stands first. Next comes CKD (5.7%) 11 and pulmonary oedema (4.2%) 8 respectively. Other co morbid conditions found were 3.6% (7) respiratory disorders, 3.1 % (6) GIT disorders, 2.6 % (5) CVA, 1 % (2) of dyslipidemia, UTI, anaemia and sepsis. The least found co morbidities were 0.5% (1) cervical spondylitis and rheumatoid arthritis [Figure. 3].

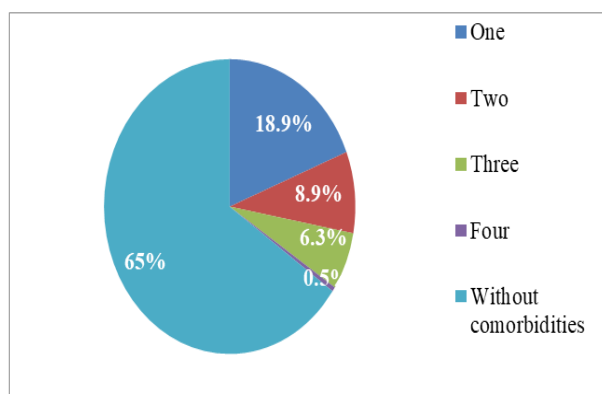


Fig 3:- Co-Morbid Condition among CVD

**D. Number of Comorbidities in the Study Population**

We observed the number of co morbidities in the study population. Patients without co morbidities were found to be 65 % (124), one co morbidity was 18.9% (36), Two co morbidities were observed in 8.9 % (17), Three co morbidities were found in 6.3 % (12), Four co morbidities was found in 0.5% (1). The result shows that the total co morbidity 34.6% (66) was observed in the study population [Figure. 4].

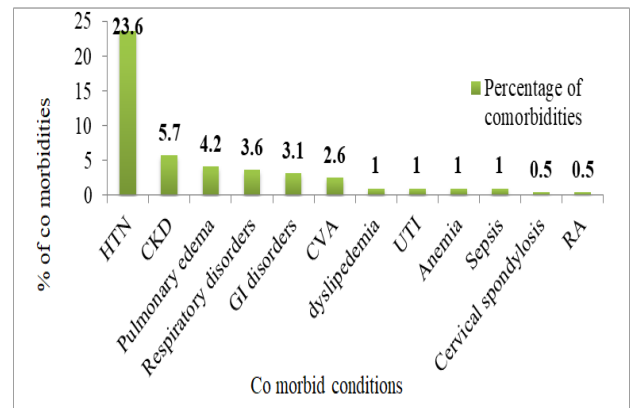


Fig 4:- Number of Co Morbidities in the Study Population

**E. Antiplatelets, Anticoagulants & Fibrinolytic**

In our study 60.4% (149) were on Antiplatelet therapy. Among these 27.2% (67) patients were on Clopidogrel, 26% (64) were on Aspirin, 5(2%) were on Prasugrel, 9(3.6%) were on ticagrelol and the least was Tirofiban with 4(1.6%). 34.4% (85) patients received Anticoagulants. Among the anticoagulants, 22.7% (56) LMWH, 7.7% (19) fondaparinux and 2% (5) enoxaparin were used. The use of Warfarin, heparin and daltiparin was found in lesser percentage like 0.8% (2), 0.8% (2), 0.4% (1) respectively. Among the fibrinolytics prescribed, 2.8% (7) were streptokinase followed by 2 % (5) tenecteplase [Figure. 5].

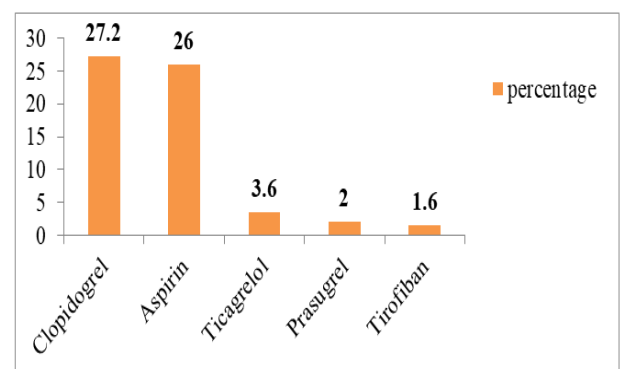


Fig 5:- Antiplatelet, Anticoagulants & Fibrinolytics

**F. Dyslipidemic Drug Therapy**

This study shows a total number of 9.04 % (164) Dyslipidemic drugs prescribed. The most commonly prescribed drug Atorvastatin was of 64.6 % (106), followed by Rosuvastatin 34.1 % (56) and the least prescribed drug was found to be Fenofibrate with 1.2% (2) [Figure. 6].

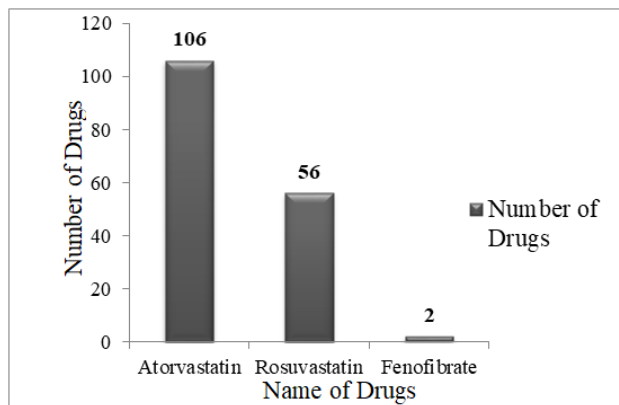


Fig 6:- Dyslipidemic Drug Therapy

**G. Beta Blocker Drug Therapy**

The result shows the total number of prescriptions with  $\beta$  – blockers were 120. 53.3 % (64) were prescribed with Metoprolol, 20.8% (25) with Bisoprolol, 17.5% (21) with Carvedilol. The prescribed Atenolol and Nebivolol comprises of 4.1% (5) [Figure. 7].

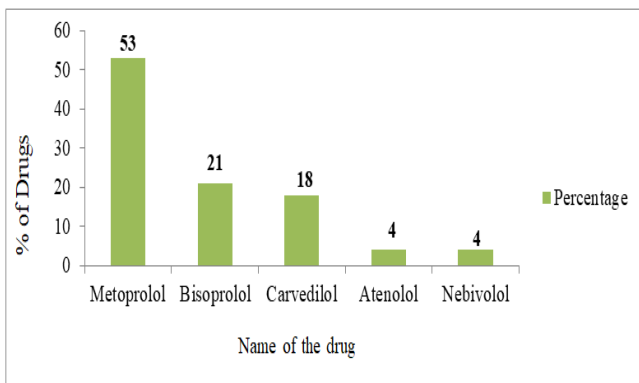


Fig 7:- Beta Blocker Therapy

**H. ACE Inhibitors**

ACE inhibitors has been widely used to treat cardiovascular disorders and the total number of prescriptions with ACE inhibitors 31.54.8% (17) prescriptions with Ramipril, 22.5% (7) with Perindopril, 19.3% (6) with Enalapril and Lisinopril were found to be 3.2% (1) [Figure.8].

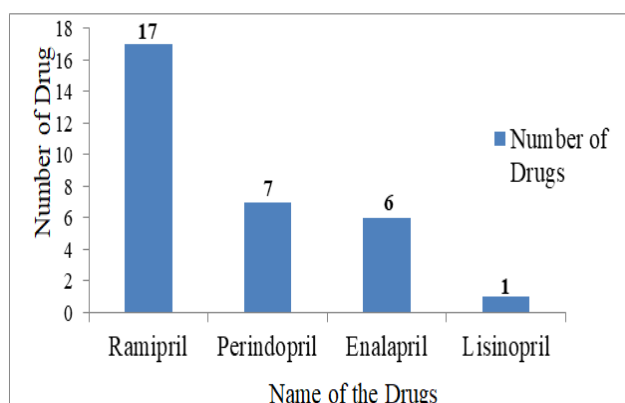


Fig 8:- ACE inhibitors

**I. Calcium Channel Blockers Drugs**

Out of the CCB prescribed, Amlodipine 51%(18) was found to be mostly prescribed followed by 26%(9) of Clinidipine, 14%(5) of Nifidipine, 6%(2) Verapamil and the least was 3%(1) Flunarazine [Figure. 9].

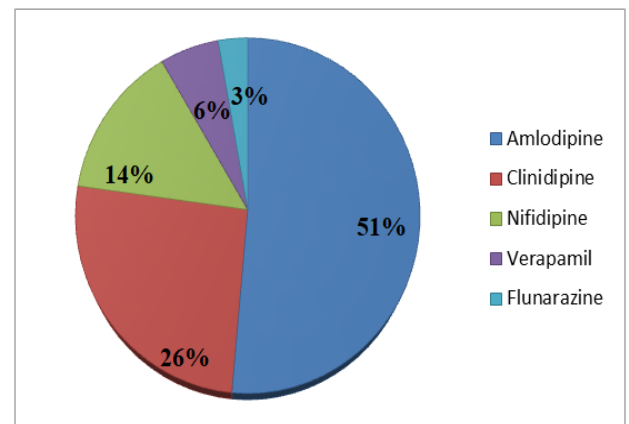


Fig 9:- CCB drugs

**J. Other Category of Cardiovascular Drugs**

The other categories of cardiovascular drugs include Ionotropes, Antiarrhythmics, ARBs and Alpha antagonists. In Ionotropes, 11% (5) Digoxin was the mostly prescribed drug followed by 5 % (2) Dopamine. Among Antiarrhythmics prescribed, 7% (3) Adenosine followed by 5% (2) Amiodarone and 2% (1) Procainamide. Out of the ARBs prescribed, 55% (24) Telmisartan followed by 5% (2) Losartan and 2% (1) Olmesartan. In case of Alpha antagonist, 5% (2) is of Terazosin followed by 2% (1) Prazosin HCl and 2% (1) Hydralazine [Figure. 10].

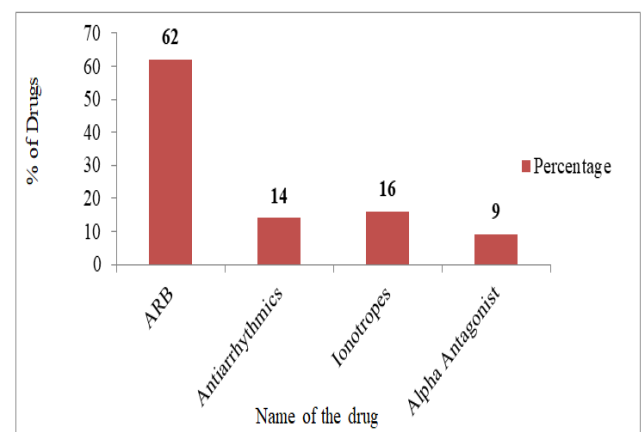


Fig 10:- Other Category of Cardiovascular Drugs

**K. Antidiabetic Drugs for CVD**

A total of 213 Antidiabetic drugs were prescribed. Among the Antidiabetic drugs prescribed in cardiovascular condition, 42.3% (91) Metformin has the highest number followed by 26.7% (57) Glimipride+Metformin combination, 17.8% (38) Insulin, 6.5% (14) Gliclazide, 3.7% (8) Glimipride, 1.4% (3) Miglitol and the least with 0.93%(2)Repaglinide.[Figure.11].

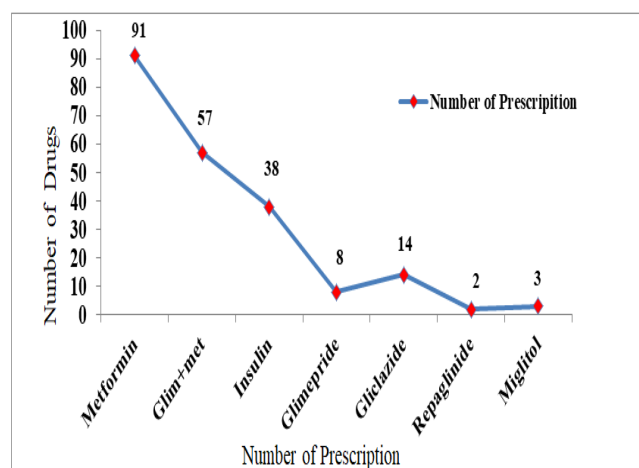


Fig 11:- Anti Diabetic Drugs in CVD

#### IV. DISCUSSION

Total 190 patient data was collected and analyzed. Present study showed that the predominance of male 76 % with early onset of cardiovascular diseases than female 24 %. When categorized age wise, maximum number of male patients (49) were from the age group 61-70 years. Majority of the 65% patients from this study were without any co morbidity 34.6 % were presented with co morbidities. The commonest co-morbid condition seen in this group of patients was HTN 23.6 %, followed by CKD 5.7 %, pulmonary edema 4.2% and respiratory disorders 3.6 % of the patients .

A total 946 cardiovascular drugs were distributed to the patients. Among the overall cardiovascular drug distribution, 26% (246) were antiplatelets, anticoagulants and fibrinolytics, 10% (95) of Diuretics, 23% (217) of dyslipidemic agents, 13% (120) of beta blockers, 3% (31) of ACE inhibitors, 3% (27) of ARB, 4% (35) of CCB. Distributions of Diuretics therapy in the CVD patients were 15.82 % (85). Among these 76.4 % (65) were Furosemide, 16.4 % (14) were Spirinolactone, 11.7 % (10) were Eplerenone. Metolazone and Mannitol were 2.3% (2) followed by Toremide and Chlorthalidone with 1.1%.

This study shows a total number of 9.04 % (164) Dyslipidemic drugs prescribed. The most commonly prescribed drug Atorvastatin was of 64.6 % (106), followed by Rosuvastatin 34.1 % (56) and the least prescribed drug was found to be Fenofibrate with 1.2% (2).

$\beta$ -Blocker are an essential class of cardiovascular medications for reducing morbidity and mortality in patients with heart failure, DM, HTN and CHD. The result shows the total number of prescriptions with  $\beta$  – blockers were 120. 53.3 % (64) were prescribed with Metoprolol, 20.8% (25) with Bisoprolol, 17.5% (21) with Carvedilol. The prescribed Atenolol and Nebivolol comprises of 4.1% (5).

ACEIs in patients with hypertension, heart failure, and myocardial infarction (MI), and for prevention of secondary stroke, cardiovascular events, and diabetic

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#### V. CONCLUSION

The present study concluded that cardiovascular drugs were prescribed rationally according to the standard treatment guidelines. Drug interactions were found during the prescription analysis. Lack of medication adherence was found during the study.

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