ASSESSMENT OF PRESCRIPTION PATTERN IN PATIENTS HAVING CHRONIC HEART FAILURE: A SINGLE CENTER PROSPECTIVE STUDY

Bincy Babu[1*], Devika Vijay[1], Riya Raju G.[1] and Sheen Varghese[1], Dr. Samhitha John Chetty[2] and Dr. P. Mahesh Babu[3]

[1]Pharm D Interns, K.K. College of Pharmacy, 1/161, Sankaralinganar Road, Gerugambakkam, Chennai. PIN: 600128.

[2]Assistant Professor, Department of Pharmacy Practice, K.K. College of Pharmacy, 1/161, Sankaralinganar Road, Gerugambakkam, Chennai PIN: 600128.

[3]M.D., DNB, Interventional Cardiologist, Vijaya Group of Hospitals, Vadpalani, Chennai.

*Corresponding Author

Bincy Babu

Pharm D Interns, K.K. College of Pharmacy, 1/161, Sankaralinganar Road, Gerugambakkam, Chennai. PIN: 600128.

ABSTRACT

Background: The mortality and morbidity of Congestive heart failure in India is higher than the western population. The objectives of this study was to develop a baseline data on drug prescription pattern and the utilization of combination therapy and the adverse drug reactions associated with the Heart Failure drugs. **Materials and Methods:** The data was collected prospectively from Department of Cardiology, Vijaya Group of Hospitals, Vadapalani, Chennai of patients admitted for chronic heart failure during the period of 6 months from April 2018 - September 2018. **Results and Discussion:** Our study reveals that 1570 drugs were prescribed for 100 patients (69 males and 31 females) and number of prescribed drugs per prescription was 1139 drugs were given by oral route, 394 drugs by parenteral route and 27 drugs by inhalational route. The mostly drug prescribed drug was Diuretics (100%). Among the two drug combination, Diuretics+Beta blockers was the most commonly prescribed (42.30%), for three drug combination Antiplatelet +Beta blockers+ Diuretics (40.81%) was the most commonly prescribed and in the four drug combination, Nitrates+Beta blockers+ Antiplatelet +Diuretics (50%) was the most commonly prescribed. **Conclusion:** The incidence of heart failure was slightly higher in males than in females and also it was higher in patients between the age group of 61-70 years. A combination therapy proves to be more effective than a single drug.

We try to conclude that poly-therapy is better than mono-therapy in patients with Chronic Heart Failure.

KEYWORDS: Prescription pattern, Heart Failure, Diuretics.

INTRODUCTION
Heart failure (HF) is a clinical syndrome caused by structural and functional defects in myocardium resulting in impairment of ventricular filling or the ejection of blood. The most common cause for HF is reduced left ventricular myocardial function; however, dysfunction of the pericardium, myocardium, endocardium, heart valves or great vessels alone or in combination is also associated with HF.[1]

Prescription Pattern of Drugs In Chronic Heart Failure
Prescription pattern monitoring studies are drug utilization studies with the main focus on **prescribing,** dispensing and administration of drugs. They promote appropriate use of monitored drugs and reduction of abuse or misuse of monitored drugs.

Prescribing indicators: Prescribing indicators measure the performance of health care providers in several key dimensions related to the appropriate use of drug. The indicators are based on the practices observed in a sample of clinical encounters taking place at both outpatient and inpatient health facilities for the treatment of acute and chronic illness.

WHO prescribing indicators include:
1. Average number of drugs per encounter
2. Percentage of drugs prescribed by generic name
3. Percentage of encounters with an antibiotic prescribed
4. Percentage of encounters with an injection prescribed
5. Percentage of drugs prescribed from essential drugs list or formulary

In India, there is lack of data regarding the incidence and prevalence of heart failure. Therefore, there is an urgent need to have a documentation of heart failure cases at the secondary, tertiary and national level. These will help in providing us the information related to heart failure, prevalence, incidence, causes and help in adopting various management strategies.[2]

Accurate diagnosis, proper prescribing, correct dispensing, suitable packing and patient adherence are important for rational use of drugs.[3] The consequences of irrational prescribing include ineffective treatment, unnecessary prescription of drugs, development of resistance and economic burden on patients and the society.[4] 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.[5]

The objectives of this study was to develop a baseline data on drug prescription pattern and the utilization of combination therapy as well as the adverse drug reactions associated with the Heart Failure drugs.

MATERIALS AND METHODS

Materials

This study was a prospective observational study conducted in the Inpatient department of Cardiology, Vijaya Group of Hospitals, Vadapalani, Chennai. The study was approved by the Institutional Ethics Committee of Vijaya Group of Hospitals, Vadapalani, Chennai (Reg. No.: ECR/677/Vijaya/Inst/TN/2013-Re-registration-2016). The study was conducted for a period of 6 months from April to September 2018. A total of 100 patients were enrolled in the study.

Inclusion Criteria

1. Either gender of age > 18 years
2. All inpatients diagnosed with Chronic Heart Failure.

Exclusion Criteria

1. Patients < 18 years
2. Pregnant and lactating women
3. Outpatients

Methods

Data was recorded in a preformed pro-forma that consists of: Socio-demographic data, Length of hospitalization, Present Medical History, Past medical history, Past Medication History, General and Systemic examination, Investigations performed (CBC, ECG, and ECHO etc.), Diagnosis, Treatment Given (Dose, Mode of administration, Duration, Drugs prescribed by generic name and brand name, other treatment [if any] given.) and outcome of treatment.

The prescription pattern of drugs in patients having heart failure was stratified according to the following considerations; Age and gender wise distribution of patients, Length of hospitalization, Co-morbid conditions to Chronic Heart Failure, Different drugs used in patients with Chronic Heart Failure, Two drug combinations prescribed in a regimen, Three drug combinations prescribed in a regimen, Four drug combinations prescribed in a Regimen and Distribution pattern of overall use of drugs in Chronic Heart Failure.

Statistical Analysis

The data collected was entered into Microsoft Excel Sheet. Descriptive statistical procedure and evaluation was done to analyse the results.

RESULTS

Age And Gender wise Distribution

The mean age of the subjects was found to be 60.7±16 years. According to age wise characterization among the 100 subjects included in the study, 69 (69%) were males and 31 (31%) were females and the majority of Heart Failure patients were in the age group of 61-70 (27%).

Route of Drug Administration

Most commonly used route of drug administration was Oral i.e. 1139 drugs (72.54%), Parenteral i.e. 394 drugs (25.09%) followed by Inhalation i.e. 27 drugs (1.71%) and other routes – Per rectal and Local application i.e. 10 drugs (0.64%).

Drugs Prescribed By Generic and Brand Names

Out of the 1570 drugs prescribed, only 12.1% (190) drugs were prescribed by generic names and rest of 87.89% (1380) drugs were prescribed by brand name.

Length of Hospitalization

The mean length of hospitalization for males was 7.07±4.97 days and for females it was 7.7±5.3 days.

Comorbid Conditions

Our study showed that among 100 patients, Hypertension was the most observed comorbid condition seen in both males (53%) and females (23%).

Classification of Heart Failure on The Basis of Ejection Fraction

Majority of the study subjects (98%) were with Heart failure with reduced ejection fraction (HFrEF) and only 2% patients were diagnosed as Heart Failure with preserved ejection fraction (HFpEF).

Overall Distribution of Drugs

Diuretics (100%) was the most commonly used drugs, followed by Antiplatelet (78%), Anticoagulants (71%), Nitrates (63%), inotropic agents (49%) and Cardiac glycosides (12%) as shown in figure 1.
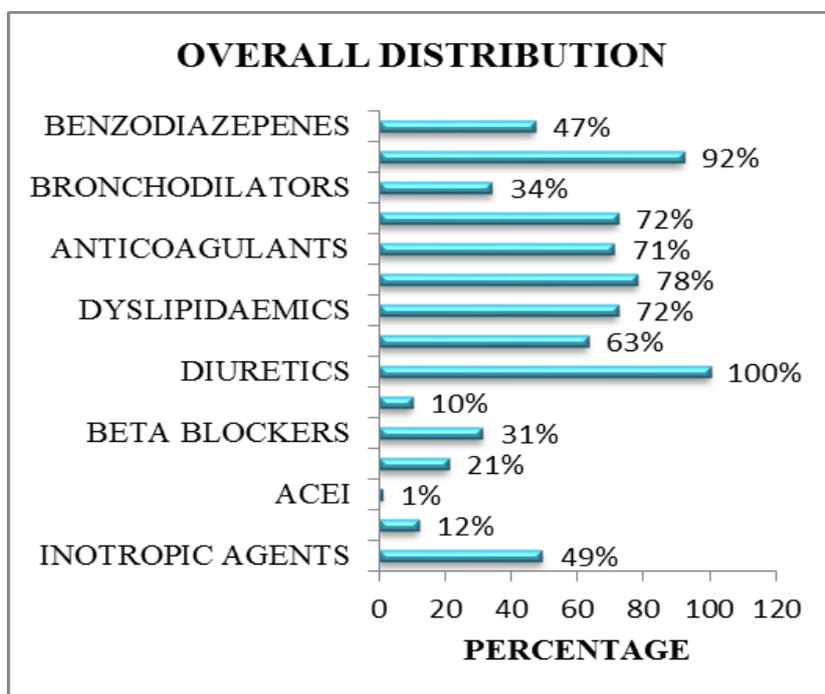

Figure 1: Overall distribution of drugs.

DRUG COMBINATION

Two Drug Combinations Prescribed In A Regimen

Among 100 patients, two drug combination was given for 52 patients. The most commonly prescribed two drug combination in a regimen was **Diuretics and Beta Blockers (42.30%)** followed by **ACEI/ARB and Diuretics (34.61%)**. **Diuretics and Digoxin combination was 23.07%** as shown in figure 2.
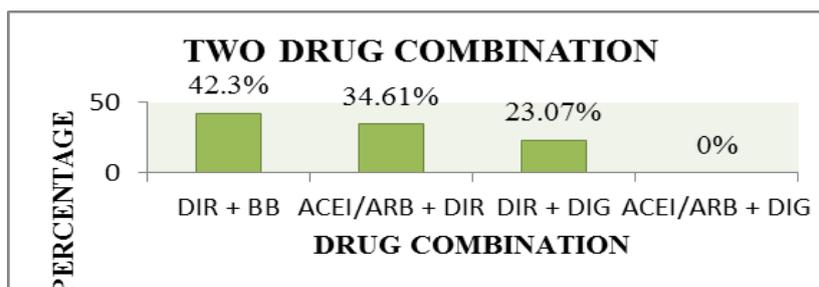
Figure 2: Two drug combinations in a regimen.

Three Drug Combination

Among 100 patients, three drug combination was given for 49 patients. The most commonly prescribed three drug combination was **ANTIPLATELETS + BETA BLOCKERS + DIURETICS (40.81%)** as shown in figure 3.
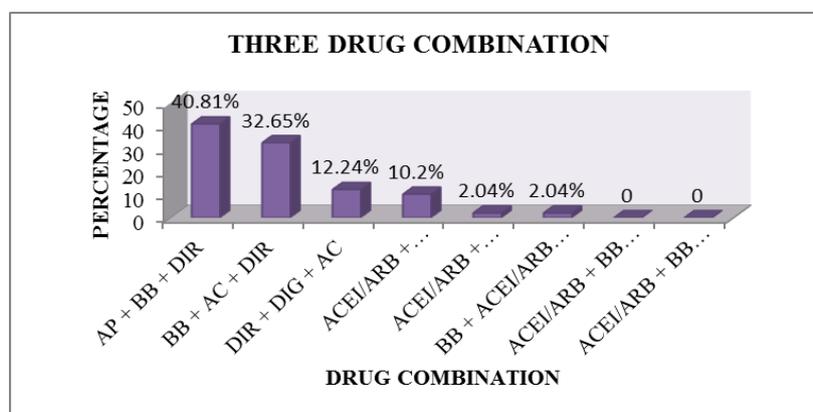

Figure 3: Three drug combination in a regimen.

Four Drug Combination

Among 100 patients, four drug combination was given for 28 patients. The most commonly prescribed four drug combination in a regimen **was NITRATES + BETA BLOCKERS + ANTIPLATELETS + DIURETICS (50.00%)** as shown in figure 4.
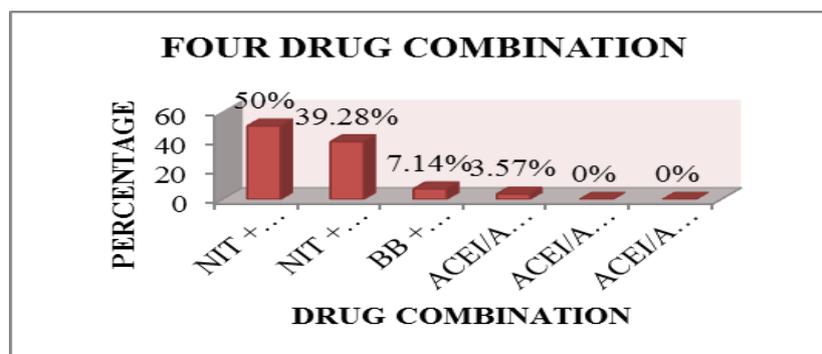

Figure 4: Four drug combination in a regimen.

Adverse Drug Reactions

Among the 100 subjects enrolled in the study, adverse drug reaction occurred in two patients. The drugs that caused ADR were Inj. Magnex 1g (Cefoperazone + Sulbactum) and T. Nikoran 5mg (Nikorandil) as shown in table 1.

Table 1: Adverse drug reactions associated with the therapy.

Drug	Reaction	No. Of Prescription (n=100)	Naranjo Score	Causality Assessment
INJ.MAGNEX (1g)	Rashes and itching	1	9	Definite
T.NIKORAN (5mg)	Urticaria	1	7	Probable

DISCUSSION

This study analysed the prescription pattern of drugs used in patients with heart failure.

The mean age of the patients was found to be 60.7±16 years. The majority of Heart Failure patients were in the age group of 61-70 (27%), which correlates with the study conducted by Abhijith Rao et al., in 2017.[6]

A total 1570 drugs were prescribed for 100 patients (69 males and 31 females) who were included in the study, of which 72.54% drugs were given by oral route, 25.09% drugs were given by parenteral route, 1.71% drugs were given by inhalational route and 0.64% drugs were given by other routes such as rectal and local application.

Out of 100 patients included in the study, about 21% patients received ARBs.

In present study Diuretics were administered to all patients and Furosemide was the most commonly prescribed diuretic. 64% patients received Furosemide, 7% patients received Torasemide, 25% patients received Spironolactone and 4% patients received Metolazone. This study correlates with that of the Prescription pattern study conducted by Prasun Banerjee et al., in 2017.[7]

About 31% of the patients received Beta Blockers, of which 16% patients received Metoprolol and 15% received Carvedilol.

A total of 10% patients were prescribed with Calcium Channel Blockers, out of which 8% patients received Cilnidipine and 2% patients received Diltiazem.

About 72% of patients were prescribed Dyslipidaemic agents, 47% of them received Atorvastatin and 25% of them received Rosuvastatin. Digoxin was prescribed to 12% of patients.

The inotropic agents prescribed were Dobutamine, Dopamine and Noradrenaline. About 32% of patients received Dobutamine, 14% of patients received Dopamine and 3% patients received Noradrenaline.

Anti-platelet agent clopidogrel was prescribed for 42% of study subjects and aspirin to 36% of patients for its antiplatelet effect. The combination of Aspirin and Cloipidogrel was given to 27% of patients; Tirofiban was given for 6% patients and Ticagrelor for 15% patients.

71% of patients received anticoagulant therapy. About 50% of the patients received Heparin, and 21% patients received Enoxaparin.

In present study 72% of patients received antimicrobial agents. Most commonly used AMA was Cefoperazone/ Sulbactum in 23% of patients.

Antibiotics were prescribed as prophylaxis. This study correlates with of the prescription pattern study conducted by Prasanna Kumar B et al., in 2015.[8]

A total 34% of patients were prescribed bronchodilators, Salbutamol/Ipratropium bromide was given for 17% patients. A total of 47% patients received Benzodiazepines. A total of 92% patients received Proton pump inhibitors (PPI).

A Total of 1570 drugs were prescribed for the 100 patients taken in to the study, the average drugs prescribed per prescription was found to be 15.70.

Out of the 1570 drugs prescribed only 12.1% (190) of the drugs were prescribed by generic name showing that most of the drugs were prescribed by brand names, 87.89% (1380).

Among the 100 patients taken in to the study 52% of the patients were prescribed Two drug combination, 49% of the patients were prescribed Three drug combination and 28% of the patients were prescribed Four drug combination.

The most prescribed Two drug combination was DIR+BB, Three drug combinations was DIR+BB+AP and Four drug combination was DIR+BB+AP+NITS.

Adverse drug reaction occurred in 2 patients by the drugs Inj. Cefoperazone/ Sulbactum and T.Nikoran with Causality Assessment of Definite and probable ADR respectively.

CONCLUSION

This present study analysed the prescription pattern of drugs used in chronic heart failure patients. The analysis of the prescription pattern was carried out using various variables such as, age, gender, and length of hospitalization, routes of administration, generic or brand names. The drugs prescribed were further evaluated based on combination therapy (two drug, three drug, and four drug combination prescribed in a regimen).

After prescription analysis was carried out in 100 patients, we found out that Diuretics was the most commonly prescribed drug (100%) in chronic heart failure. Diuretics and Beta blockers (22%) being the most commonly prescribed two drug combination therapy.

The Prescription pattern studies provide a good tool in Pharmacoepidemiologic studies, a good research methodology for building evidence and very helpful in assessing and changing policy for improving the condition of the patients in building a healthy society with limited burden.

ACKNOWLEDGEMENT

REFERENCES

1. Dassanayaka, S.; Jones, S.P. Recent Developments in Heart Failure. Circ. Res., 2015; 117: e58–e63.

2. Reddy S, Bahl A, Talwar KK; Congestive heart failure in Indians: How do we improve diagnosis & management? Indian J Med Res., 2010; 132(5): 549–560.

3. Alam K, Mishra P, Prabhu M, Shankar PR, Palaian S, Bhandari RB. A study on rational drug prescribing and dispensing in outpatients in a tertiary care teaching hospital of Western Nepal. Kathmandu University Medical Journal, 2006; 4(16): 436-443.

4. Salman MT, Akram MF, Rahman S, Khan FA, Haseen MA, Khan SW. Drug prescribing pattern in surgical wards of a teaching hospital in North India. Indian Journal for the Practising Doctor, 2008; 5: 5-6.

5. Shankar PR, Kumar P, Rana MS, Partha P, Upadhayay DK, Dubey AK. Morbidity profile and drug utilization in a sub-health post in Western Nepal. Calicut Medical Journal, 2004; 2(4): 4.

6. Abhijith Rao, Sharath Kumar k, Mohandas Rai. Prescription pattern in patients having Heart Failure in a South Indian Tertiary Care Hospital. International Journal of Comprehensive and Advanced Pharmacology, 2017; 2(2): 50-55.

7. Prasun Banerjee, Ananya Mandal et al. Assessment of Drug Utilization Pattern and Rationality of Drug use in treatment of Dilated Cardiomathy in a tertiary care teaching Hospital of Rural Bengal. International Journal of Basic and Clinical Pharmacology, 2017; 6(1): 123-127.

8. Prasanna Kumar B.Jewargi, Ravi. D. Mala et al. Drug Utilization in CHF at a Tertiary Care Hospital. Scholars Journal of Applied Medical Sciences, 2015; 3(2): 857-862.