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EC CARDIOLOGY
Research Article

Adherence to Guideline-Directed Medical Therapy in Patients with Heart Failure with Reduced Ejection Fraction in Shahid Gangalal National Heart Centre, Kathmandu, Nepal

Chandra Mani Adhikari*, Reeju Manandhar, Dipanker Prajapati, Murari Dhungana, Amrit Bogati and Rishikesh Rijal

Department of Cardiology, Shahid Gangalal National Heart Centre, Nepal

***Corresponding Author**: Chandra Mani Adhikari, Department of Cardiology, Shahid Gangalal National Heart Centre, Bansbari, Kathmandu, Nepal.

Received: June 04, 2016; **Published:** June 28, 2016

Abstract

Background and Aims: Heart Failure(HF) with reduced Ejection Fraction (HFrEF) is defined as the clinical diagnosis of HF and left ventricular ejection fraction (LVEF) ≤ 40% also referred to as systolic HF. Guideline-directed medical therapy (GDMT) has shown to reduce mortality for HFrEF. We aim to evaluate adherence to GDMT treatment in our Centre.

Methods: Medical records of 422 with HFrEF patients discharged from our centre in between January 2014 to December 2014 were retrospectively reviewed. Performa was designed to collect patient information which included; age, gender, NYHA functional class at the time of admission, total hospital stay, Left Ventricular Internal Diameter, Left Atrial size, LVEF, Systolic, diastolic blood pressure, heart rate at the time of discharge, creatinine and the drugs used at the time of discharge were recorded.

Results: Among the 422 patients included in this study, 232 (54.9%) were males and 190 (45.1%) were females. The mean age was 63.4 ± 15.5 years. Most of the patients were in NYHA class IV (65.6%), and in Sinus rhythm (78.5%). Among the discharged patients' diuretic, Angiotensin converting enzyme inhibitor (ACEI)/Angitensin receptor blocker (ARB), β-blocker, Aldosterone Antagonist, and digoxin were prescribed in 100, 86.7, 28.4, 83.9 and 47.9% patients respectively.

Conclusion: ACEI/ARB, diuretic, aldosterone antagonist and digoxin used in HFrEF comparable to international studies. Use of β-blocker is not comparable to international studies. We still need some effort to increase improve our prescription rate of β-blockers.

Keywords: *ACEI; ARB; Aldosterone antagonist; β-blocker; Guideline-directed medical therapy (GDMT); Heart Failure with reduced Ejection Fraction (HFrEF)*

Introduction

Heart Failure with reduced Ejection Fraction (HFrEF) is defined as the clinical diagnosis of Heart Failure (HF) and Left ventricle ejection fraction(LVEF) ≤ 40%. Also referred to as systolic HF. Guideline-directed medical therapy (GDMT) has shown to reduce mortality for HFrEF. These medications include Angitensin converting enzyme inhibitor (ACEI)/Angitensin receptor blocker (ARB), β-blocker and Aldosterone antagonist (AA). Digoxin can be beneficial in these patients to decrease Hospitalizations whereas Diuretics are recommended to improve symptoms [1].

Adherence to GDMT influences HF outcome positively [2,3]. Physician-adherence to GDMT is one strategy to improve the dismal outcome in HF [4]. Multiple publications on physician-adherence to HF guidelines attest to its growing importance [5,6]. Such studies have

consistently uncovered variations and potential disparities in the care of HF patients [2,5,7,8]. We aim to evaluate adherence to GDMT treatment in our centre.

Methods

It was a retrospective, single centre study, performed at Shahid Gangalal National Heart Centre, Bansbari, Kathmandu, Nepal. Discharge summaries of 422 patients who were diagnosed as a case of HFrEF who were admitted for the first time and were discharged in between January 2014 to December 2014 were retrospectively reviewed.

Patients with the diagnosis of acute or old Myocardial Infarction, Ischaemic heart diseases, valvular heart disease were excluded. In case of multiple admissions last discharge will be included. Performa was designed to collect patient information which included; age, gender, NYHA functional class at the time of admission, total hospital stay (days), left ventricle internal diameter in diastole (LVID). Systolic and diastolic blood pressure at the time of discharge, heart rate at the time of discharge, creatinine (Cr) and the drugs used at the time of discharge were recorded.

All the variables were entered into the Statistical Package for Social Sciences software, version 16 (SPSS Inc) for data analysis. Descriptive statistics were computed and presented as means and standard deviations for continuous variables like age and LVEF, categorical variables were reported in percentages.

Results

Among the 422 patient included in this study male and female were almost equal in number. The mean age was 63.4 ± 15.5 years. Most of the patients 331 (78.5%) were in sinus rhythm. Most patient 277 (65,6%) were admitted for NYHA class IV heart failure. Median hospital stay was 5.3 ± 2.7 days. Clinical characteristics and features are shown in Table 1 and table 2.

Characteristic	n	%
Male	232	54.9
Female	190	45.1
Sinus Rhythm	331	78.5
Atrial fibrillation	70	16.6
Pacemaker	21	4.9
NYHA II	90	21.3
NYHA III	55	13.1
NYHA IV	277	65.6
Heart rate≤60	23	5.4
Systolic BP≤90 (mmHg)	124	29.4
Cr>225 (μmol/L)	11	26

Table 1: *Clinical characteristics.*

Demographics	Mean + SD
Age (years)	63.4 ± 15.5
Hospital Stay (days)	5.3 ± 2.7
NYHA (class)	3.4 ± 0.8
LVID (cm)	6.2 ± 0.8
Left Atrial rise (cm)	4.3 ± 0.6
LVEF (%)	24.7 ± 7.1
Systolic blood pressure (mmHg)	103.8 ± 15.3
Diastolic blood pressure (mmHg)	68.1 ± 9.1
Heart rate<60 (bpm)	79.1 ± 11.6
Cr (µmol/L)	101.4 ± 41.7

Table 2: *Clinical features.*

In our study Diuretic (100%), was the most commonly used followed by ACEI or ARB (86.7%), AA (83.9%), digoxin (47.9%) and β-blocker (28.4%) as shown in table 3.

Drugs		No. of patients	%	Mean Dose
ACEI	Enalapril	225	53.3	3.4 ± 1.8 mg
	Ramipril	17	4.0	3.6 ± 2.5
ACEI total		242	57.3	
ARB	Losartan	114	27.0	34.9 ± 15.2 mg
	Telmisartan	10	2.4	32.0 ± 10.2
ARB total		124	29.4	
ACEI+ARB		366	86.7	
β-blocker	Carvedilol	75	17.8	9.1 ± 9.0 mg
	Metoprolol	20	4.7	22.5 ± 5.1 mg
	Bisoprolol	25	5.9	2.6 ± 1.1 mg
β-blocker		120	28.4	
Diuretics	Frusemide	385	91.2	63.2 ± 22.5 mg
	Torsemide	37	8.8	44.8 ± 20.3 mg
Diuretics		422	100	
Aldosterone Antagonist	Spironolactone	352	83.4	28.3±10.3
	Epeleronone	2	0.5	37.5 ± 17.6
		354	83.9	
Digoxin		202	47.9	0.13 ± 0.03
ACEI+ β blocker+ AA		84	19.9	

Table 3: *Drugs used*

All the three anti HF drugs β-blocker, ACEI or ARB and AA were prescribed in 84 (19.9%) patients.

Discussion

GDMT in HF reduces morbidity and mortality. This has been emphasized in all international practice guidelines. In our study ACEI or ARB was prescribed in 86.7% patients. This prescription rate is better than the study done in (51.4%) Pakistan [9] and (69%) India [10] almost equal to the prescription rate in (83%) Nigeria [11], South Africa (79%) [12]. Interestingly, ours was higher than the ACEI/ARB adherence noted in Japan [2] and rural Australia [6]. In our study, adherence to β-blocker was 28.4% which is lower than, (34%) rural Australia and (48%) in Nigeria [11], but much lower than (57.8%) Japan [2] and (78%) South Africa [12]. But our adherence rate is better than in Pakistan [9] 35.9% and in rural Australia 34% [6].

AA was used in 83.9% patients in our study it is better than the study done in (46.9%) Pakistan [9], (41%) Nigerian [11], (79%) South Africa [12] and (17%) Indian study [10].

Digoxin use in our study was 47.9%, it uses varies a lot, in a study done in Pakistan [9] it was 75 %, (82%) Nigerian study [11], (67%) South African Study [12] and (27%) in Indian study [10].

Diuretics remain the first line of treatment of edema or volume overload particularly in patients of HF. Diuretics reduce pulmonary edema and venous congestion, diuretics (75%). Frusemide (91.2%) is the most commonly used diuretic followed by torsemide in 8.8% patients. In an Indian study [10] 91% of patients received Furosemide, 25% of patients received Torsemide.

A study done by Shore., *et al*. in US which included 92,361 ischaemic cardiomyopathy patients and 63,652 non-ischemia Cardiomyopathy patients showed that ACEI was used in 90.7% vs 93%, β-blocker in 94.9% VS 93.9% and AA in 31.4% vs 34.5% patients [13]. In a study done in Six European countries (France, Germany, Italy, The Netherlands, Spain, and UK). ACEI (88%), diuretics (82%), cardiac glycosides (52%), β-blockers (58%), and AA (36%) were prescribed [3]. Our AA prescription rate was better than these two studies. In other medication we need some more effort to improve our self.

Despite concrete data to support the use of GDMT in all stages of HF there is considerable variation in the prescription of these therapies in patients with HF. Multiple factors influence the prescription of ß- blockers including concerns regarding advanced age, low LVEF, bradycardia, low BP; these may be the very people who stand to benefit from the GDMT [14]. Similarly ACEI and AA are known to be under prescribed due to concerns regarding renal function and sometimes for no discernible reasons [15,16]. In our study only 5.9% patient had heart rate less than 60 bpm, Cr more than 225 was present in 11 patient. Low BP which means systolic BP of less than 90 mmHg was present in 29.4% patients. Though contraindication to ACEI/ARB, β-blocker and AA are present in our study but lower prescription of β-blocker compared to studies done in other country cannot be explained just to contraindication.

The limitations of this study are; it is a retrospective, observational, non-randomized study that depends only on the data of a single centre. However, this study provides valuable reflection of our day to day practices.

Conclusion

ACEI/ARB, diuretic, AA and digoxin used in HFrEF comparable to international studies. Use of β-blocker is not comparable to international studies. We still need some effort to increase improve our prescription rate of β-blockers.

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Volume 2 Issue 3 June 2016