

Original Article**Clinical Profile of Patients with Heart Failure in Eastern Part of Nepal: A Hospital based study****Abdul Khaliq Monib¹, Sahadeb Prasad Dhungana¹, Rajesh Nepal¹ and Rinku Ghimire²**¹Cardiology Unit, Department of Internal Medicine, ²Department of Pharmacology

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DOI: <http://dx.doi.org/10.3126/jonmc.v8i1.24477>**Abstract****Background**

There is limited information on the clinical profile of patients with heart failure from the Nepalese population.

Materials and Methods

This is a descriptive cross-sectional study on 120 consecutive patients with New York Heart Association class II to IV symptoms of heart failure admitted from June 2018 to January 2019 at Nobel Medical College Teaching hospital, Biratnagar, Nepal.

Results

Mean age was 52.2 ± 20.6 years. The male and female ratio was 0.71. Ischemic cardiomyopathy, rheumatic heart disease, dilated cardiomyopathy, acute coronary syndrome, hypertensive heart disease, and peripartum cardiomyopathy were common etiologies constituting 22.5%, 19.1%, 13.3%, 9.1%, 8.3 % and 5% of cases respectively. Among co-morbid conditions, anemia (91.6%), hypertension (31.6%), coronary artery disease (29.1%), diabetes (20.8%) and chronic kidney disease (11.6%) were common. Among various drugs used, all patients were prescribed diuretics, 60% mineralocorticoid receptor blockers, 33.3% angiotensin-converting enzyme inhibitors, 33.3% beta-blockers, 29.1% digoxin and 8.3% angiotensin receptor blockers. Echocardiography revealed left ventricular systolic and diastolic dysfunction in 75% and 25% respectively, mitral regurgitation in 52.5%, right ventricular dysfunction in 10.8 % and pulmonary artery hypertension in 66.6%.

Conclusion

Appropriate use of evidence-based therapies, careful attention to the diagnosis and management of specific co-morbidities in patients with HF may help to improve outcomes.

Keywords: *Diagnosis, heart failure, treatment*

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Introduction

Heart failure (HF) is a clinical syndrome caused by various structural or functional cardiac abnormalities [1]. HF is an important cause of morbidity and mortality in developing countries. Around 1 to 2% of the population has HF in developed countries and at least 50% of patients have heart failure with reduced ejection fraction (HFrEF) [2]. Common etiologies of HFrEF are coronary artery disease (CAD), dilated cardiomyopathy, valvular heart disease, and hypertension. Common causes of heart failure with preserved ejection fraction (HFpEF) are hypertension, ischemic heart disease, hypertrophic cardiomyopathy, and restrictive cardiomyopathy.

The goals of treatment in HF are the reduction in symptoms, a decrease in the number of hospitalizations and the prevention of early death. The mainstay of treatment is lifestyle modifications and pharmacologic therapy. Implantable devices and surgery may be required in some patients. The number of patients with HF is increasing in developing countries due to western lifestyles and associated co-morbid conditions like diabetes, ischemic heart disease, and hypertension. Therefore, this study will give insight into the clinicodemographic profile and treatment patterns in patients with HF in a hospital setting.

Materials and Methods

This is a descriptive cross-sectional study on 120 consecutive patients with New York Heart Association (NYHA) class II to IV symptoms of HF admitted from June 2018 to January 2019 at Nobel Medical College Teaching hospital, Biratnagar, Nepal. Patients of age >12 years with a diagnosis of HFrEF or HFpEF who received care at the outpatient department or admitted in the cardiology unit were included on a consecutive basis. HF was diagnosed by history and clinical examination based on Framingham Criteria and echocardiographic assessment. The clinical variables: age, gender, underlying etiology of HF, comorbidities, and medications taken by the patient were noted.

The echocardiographic parameters like cardiac chambers size, analysis of valves, pulmonary artery systolic pressure (PASP), diastolic function, left ventricular ejection fraction (LVEF) and right ventricular function were noted. LVEF <55% was considered depressed systolic function.

Statistical Analysis

Collected data were entered in Microsoft Excel 2007 and converted into SPSS 11.5 version. Percentage, mean, standard deviation, median, and interquartile range were calculated for descriptive statistics. The tabular presentation was made for necessary variables.

Results

Mean age was 52.2 ± 20.6 years. The male and female ratio was 50:70. Table 1 illustrates the baseline clinical characteristic of patients with HF. Most patients were in NYHA class III or IV (33.3% and 43.3% respectively). Forty-three (35.8%) patients were current cigarette smokers and 12.5% were significant alcohol consumers. About one-third of patients had hypertension and 20.8% had diabetes mellitus. Ischemic cardiomyopathy, rheumatic heart disease, dilated cardiomyopathy, acute coronary syndrome (ACS), hypertensive heart disease, peripartum cardiomyopathy were common etiologies constituting 22.5%, 19.1%, 13.3%, 9.1%, 8.3%, 5% of cases respectively. Table 2 shows the various etiology of HF. Among co-morbid conditions, anemia (91.6%), CAD (29.1%), hypertension (31.6%), diabetes mellitus (20.8%) and chronic kidney disease (11.6%) were common. Chronic obstructive pulmonary disease (3.7%), sleep apnea (2.5%), hypothyroidism (2.5%) and stroke (2.5%) were less common.

Various drugs used in HF have been shown in Table 3 and Table 4. Among various drugs used, all patients were prescribed diuretics, 60% mineralocorticoid receptor antagonists (MRAs), 33.3% angiotensin-converting enzyme inhibitors (ACEIs), 33.3% beta-blockers (BBs), 29.1% digoxin and 8.3% angiotensin receptor blockers (ARBs). Among electrocardiographic abnormalities, 38.3% of patients had tachycardia, 25% had atrial fibrillation (AF) and 15% demonstrated interventricular conduction delay. Echocardiography revealed LV systolic and diastolic dysfunction in 75% and 25% of patients respectively, mitral regurgitation in 52.5%, and right ventricular dysfunction in 10.8% and pulmonary artery hypertension in 66.6% of patients. Electrocardiographic and Echocardiographic findings of patients with HF have been shown in Table 5.



Table 1: Clinical characteristics of patients with heart failure (n=120)

Age in the year (Mean and SD)	52.2 ± 20.6
Male	50 (41.6%)
Female	70 (58.3%)
Heart rate in BPM (Mean and SD)	95.4 ± 19.25
Blood pressure in mmHg (Mean and SD)	
Systolic	112.7 ± 29.22
Diastolic	71.6 ± 13.4
Presenting symptoms	
Dyspnea (NYHA class) IV	52 (43.3%)
III	40 (33.3%)
II	28 (23.3%)
Risk factors and Co-morbidities	
Anemia	110 (91.6)
Smoking	43 (35.8%)
Hypertension	38 (31.6%)
Coronary artery disease	35 (29.1)
Type 2 diabetes mellitus	25 (20.8%)
Alcohol consumption	15 (12.5%)
Chronic kidney disease	14 (11.6%)
Chronic obstructive pulmonary disease	5 (4.1%)

Abbreviations

BPM: beat per minute, NYHA: New York Heart Association

Table 2: Etiology of heart failure (n=120)

Etiology	No of patients (n=120)
Ischemic cardiomyopathy	27 (22.5%)
Rheumatic heart disease	23 (19.1%)
Dilated cardiomyopathy	16 (13.3%)
Acute coronary syndrome	11 (9.1%)
Hypertensive heart disease	10 (8.3%)
Peripartum cardiomyopathy	6 (5%)
Congenital heart disease (ASD-4, Ebstein's anomaly-2)	6 (5%)
Uremic cardiomyopathy	6 (5%)
Alcoholic cardiomyopathy	5 (4.1%)
Cor pulmonale	5 (4.1%)
Cardiac tamponade	3 (2.5%)
Sclerodegenerative aortic valve disease	2 (1.6%)

Abbreviations: ASD (Atrial septal defect)

Table 3: Drugs used in patients with heart failure (n=120)

Drug class	No. of patients (n=120)
Diuretics	120 (100%)
MRAs	72 (60%)
ACEIs	40 (33.3%)
BBs	40 (33.3%)
Glycosides	35 (29.1%)
ARBs	10 (8.3%)

Abbreviations

ACEIs: Angiotensin-converting enzyme inhibitors, ARBs: Angiotensin receptor blockers, BBs: Beta blockers, MRAs: Mineralocorticoid receptor antagonists

Table 4: Different drugs combination used in patients with heart failure (n=120)

Diuretics (only)	30 (25%)
Diuretics + ACEIs/ARBs	52 (43.3%)
Diuretics + ACEIs + BBs	16 (13.3%)
Diuretics + BBs	12 (10%)
Diuretics +ACEIs + BBs + MRAs	10 (8.3%)

Abbreviations:

ACEs: Angiotensin converting enzyme inhibitors, ARBs: Angiotensin receptor blockers, BBs: Beta blockers, MRAs: Mineralocorticoid receptor antagonists

Table 5: Electrocardiographic and Echocardiographic findings of patients with heart failure (n=120)

Electrocardiographic findings		Echocardiographic findings	
Heart rate (bpm)		LVEF	
Normal (<100)	74 (61.6%)	Normal	30 (25%)
Tachycardia (≥100)	46 (38.3%)	Reduced	90 (75%)
Rhythm		PASP	
Sinus	90 (75%)	Normal	40 (33.3%)
AF	30 (25%)	Raised	80 (66.6%)
LBBB	12 (10%)	RV dysfunction	13 (10.8%)
RBBB	6 (5%)	MR	63 (52.5%)

Abbreviations

AF: Atrial fibrillation, RBBB: right bundle branch block, LBBB: Left bundle branch block, LVEF: Left ventricular ejection fraction, PASP: Pulmonary artery systolic pressure, RV: Right ventricle, MR: Mitral regurgitation.

Discussion

About 1 to 2% of the population in developed countries suffers from HF and its prevalence rises as



people grow older [2]. At least half the patients with HF have systolic dysfunction (Ejection fraction 40% or less) [2]. At least one-third of all patients with HF have diastolic dysfunction with normal or near-normal ejection fraction [3]. In our study, 75% of patients had HFrEF and 25% had HFpEF. The lower prevalence of HFpEF in our study could be due to underdiagnosis in our population.

CAD is the single most common cause of HF in developed countries. The CAD may be a contributing factor in patients with HF of other causes [4] and sometimes it may be overlooked. In our study, around one-third of patients with HF had CAD who either presented with ischemic cardiomyopathy or de novo HF following ACS. In developing countries, RHD following rheumatic fever is a common problem [5]. It contributed 19.1% of patients with HF in our study. Although hypertension is a common problem, it is rarely a sole cause of cardiac damage leading to HF [6]. In our study, 9.1% of patients with HF were attributed to hypertension who mainly presented with accelerated hypertension and HFpEF. Dilated cardiomyopathy (DCM) is characterized by dilation and impaired contraction of one or both ventricles. These patients have impaired systolic function and may or may not develop overt HF [7]. In our study, 13.3% had echocardiographic features of DCM. The HF symptoms like dyspnea and fatigue and signs like peripheral edema are non-specific and must be assessed in the context of patient's history, clinical findings and the results of additional testing [8]. All of our patients had a history of dyspnea with the majority presented with NYHA class III or IV symptoms.

Echocardiography plays an important diagnostic role in patients with HF that differentiates HFpEF from HFrEF, the severity of LV dysfunction, valve dysfunction like mitral regurgitation, pulmonary hypertension, regional wall motion abnormality, etc [9]. In addition, echocardiographic evaluation can rapidly rule out other structural heart diseases which are also associated with signs and symptoms of HF and a normal ejection fraction. In our study, 25% had normal ejection fraction, two third had pulmonary hypertension and half of the patients had significant MR.

The goals of HF therapy are the reduction of morbidity and mortality and a decrease in hospitalization rate. The therapies should be aimed at

lifestyle modifications, correction of precipitating factors. Pharmacologic therapies are used to relieve symptoms, slow progression and improve survival. Diuretic therapy results in favorable effects on load with improvement in LV function [10]. All of our patients were prescribed diuretics mainly loop diuretics. ACEIs or ARBs, BBs, and MRAs have been documented to improve clinical status and survival of patients with HF [11]. Only 41.6 % of our patients were prescribed ACEIs or ARBs owing to a lower range of blood pressure or worsening renal function. Similarly, only 33.3% of patients were started on BBs due to fear of decompensation. In our study, the use of MRAs was more liberal since 60% of our patients were prescribed spironolactone.

The digitalis investigation group reported no mortality benefit of digoxin in HF [12]. In our study, digoxin was used mainly in patients with AF (25%) with HF as an adjunctive therapy. There is a high prevalence of co-morbidities in patients with HF. It might cause HF or it could be a cause of other co-morbidities [13]. The most common co-morbid condition in our study was anemia (91.6%) which could be due to the high prevalence of anemia in the general population in Nepal [14].

Framingham Study [15] shows that hypertension is the most common (75%) underlying disease contributing to HF. In our study, however, only 31.6 % of HF patients had hypertension as a co-morbid condition. Diabetes mellitus (DM) is associated with increased morbidity and mortality in patients with HF We found 20.8 % of patients with HF had Type 2 DM as a co-morbid condition. Other co-morbid conditions were CKD (11.6%) and COPD (4.1%).

Conclusion

HF is a common problem with significant morbidity and mortality. It is associated with various co-morbidities. There is underuse of evidence-based therapies like BBs, ACEIs, ARBs, and MRAs in our population. Appropriate use of drug therapies, prevention of CAD and RHD, prompt diagnosis and treatment of precipitation factors are important for better outcomes.

Competing interests

None declared



References

- [1] Ho KK, Pinsky JL, Kannel WB, Levy D. The epidemiology of heart failure: the Framingham Study, *J Am Coll Cardiol.* 22 (1993) 6A.
- [2] Jessup M, Brozena S, Heart failure, *N Engl J Med.* 348 (2003) 2007-18.
- [3] Gaasch WH, Zile MR. Left ventricular diastolic dysfunction and diastolic heart failure, *Annu Rev Med.* 55(2004) 373-94.
- [4] Fox KF, Cowie MR, Wood DA et al. Coronary artery disease as the cause of incident heart failure in the population, *Eur Heart J.* 55(2001) 228-36.
- [5] Mendez GF, Cowie MR. The epidemiological features of heart failure in developing countries: a review of the literature, *Int J Cardiol.* 80 (2001) 213-19.
- [6] Cowie MR, Wood DA, Coats AJ et al. Incidence and etiology of heart failure; a population-based study, *Eur Heart J.* 20 (1999) 421-28.
- [7] Luk A, Ahn E, Soor GS, Butany L. Dilated cardiomyopathy: a review, *L Clin Pathol.* 62 (2009) 219.
- [8] Dickstein K, Cohen-Solal A, Filippatos G et al. ESC guidelines for the diagnosis and treatment of acute and chronic heart failure 2008: the Task Force for the diagnosis and treatment of acute and chronic heart failure 2008 of the European Society of Cardiology: developed in collaboration with the Heart Failure Association of the ESC (HFA) and endorsed by the European Society of Intensive Care Medicine (ESICM). *Eur J Heart Fail.* 10(2008) 933-89.
- [9] Vinch CS, Aurigemma GP, Hill JC et al. Usefulness of clinical variables, echocardiography and levels of brain natriuretic peptide and norepinephrine to distinguish systolic and diastolic causes of acute heart failure, *Am J Cardiol.* 91(2003) 1140-43.
- [10] Hunt SA, Abraham WT, Chin MH, Feldman AM, Francis GS, Ganiats TG et al. Focused update incorporated into the ACC/AHA 2005 Guidelines for the Diagnosis and Management of Heart Failure in Adults: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines: developed in collaboration with the International Society for Heart and Lung Transplantation, *Circulation.* 119(2009) 391-479.
- [11] Tsuyuki RT, McKelvie RS, Arnold JM et al. Acute precipitants of congestive heart failure exacerbations, *Arch Intern Med.* 161(2001) 2337-42.
- [12] The Digitalis Investigation Group. The effect of digoxin on mortality and morbidity in patients with heart failure, *N Engl J Med.* 336(1997) 525-33.
- [13] van Deursen VM, Urso R, Laroche C, Damman K, Dahlström U, Tavazzi L et al. Co-morbidities in patients with heart failure: an analysis of the European Heart Failure Pilot Survey, *European Journal of Heart Failure* 16 (2014) 103-11.
- [14] Ministry of Health and Population (MOHP) [Nepal], New ERA, and ICF International Inc. 2012. Nepal Demographic and Health Survey 2011, Kathmandu, Nepal: Ministry of Health and Population, New ERA, and ICF International, Calverton, Maryland.
- [15] McKee PA, Castelli WP, McNamara PM, Kannel WB, The natural history of congestive heart failure; the Framingham study. *N Engl J Med.* 285 (1971) 1441-6.

