

## Clinical Profile of the Patients with Congestive Heart Failure: A Prospective Observational Study

Abhilok Kumar Jha<sup>1</sup>, Praveen Kumar Singh<sup>2</sup>, Umesh Chandra Jha<sup>3</sup>

<sup>1</sup>Senior Resident, Department of Medicine, Darbhanga Medical College and Hospital, Laheriasarai, Bihar

<sup>2</sup>Assistant Professor, Department of Medicine, Darbhanga Medical College and Hospital, Laheriasarai, Bihar

<sup>3</sup>Associate Professor, Department of Medicine, Darbhanga Medical College and Hospital, Laheriasarai, Bihar

Received: 25-01-2024 / Revised: 23-02-2024 / Accepted: 26-03-2024

Corresponding Author: Dr. Praveen Kumar Singh

Conflict of interest: Nil

### Abstract:

**Background:** Heart failure (HF) is a prevalent cardiovascular disease that has become more widespread in recent years. Its genesis involves multiple risk factors, which complicates its management and prevention. The purpose of this study was to evaluate the clinical profile of heart failure patients.

**Methods:** This prospective observational study was undertaken among the patients admitted in the Medicine unit of DMCH, Laheriasarai, and Bihar from October 2020 to September 2021. Patients fulfilling European Society of Cardiology (ESC) criteria of HF were included in the study. Prevalence of congestive HF was estimated based on community study and hospital OPD.

**Results:** Smoking, alcoholism, ischemic heart disease and hypertension were the leading risk factors in developing HF. Breathlessness (100%), swelling of the feet (92.3%), cough (57.7%) and palpitation (50%) were the most common symptoms observed in the patients. Oedema feet (100%), basal crepitations (80.3%), raised Jugular Venous Distention (JVD) (57.7%) and S3 (57.7%) were the leading signs in the patients. Chest X-ray (CXR) findings indicate that 76.9% of the patients reported with increased cardiothoracic ratio. Arrhythmias (predominantly AF-19.2%) and Left Ventricular Hypertrophy (LVH) accounted for 26.9% each. The prevalence of HF was estimated to be in between 0.51 to 27.27 respectively.

**Conclusion:** Ischemic heart disease and hypertension were the leading risk factors apart from smoking and alcoholism and the management of comorbid conditions may have sizeable effect in the clinical management.

**Keywords:** Heart Failure; Smoking; Hypertension; Prevalence.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

### Introduction

Heart failure (HF) is a major public health problem having a prevalence of over 5.8 million in the USA, and over 23 million worldwide [1]. HF is primarily considered as a condition of the elderly [2] with an incidence of 10 per 1000 population after age 65; while approximately 80% of patients hospitalized with HF are more than 65 years old [3,4].

The linear growth rate of HF is a sign of its increased prevalence due to population aging and advances in medical treatment. Recent statistics indicates that length of survival among the HF patients is increasing. This trend entails high costs for countries of which elderly population is on the rise. HF is a complex syndrome, characterized by its inability to supply blood to cater the metabolic needs of tissues in the presence of normal filling pressures or being capable of doing it only at high filling pressures [5]. HF is a growing cause of

hospitalization around the world with a lifetime risk of 1 in 5. HF can originate from CAD, high blood pressure, rheumatic heart disease, or other causes like cardiomyopathies, congenital heart disease, endocarditis and myocarditis. It is still a common reason for urgent admission to hospital and a major cause of morbidity and mortality. Since HF is a multifactorial one, often it becomes difficult to frame health policies for its reduced incidence.

In spite of the increasing recognition of the importance of HF, epidemiological, clinical and therapeutic data on the disease are still woefully inadequate which makes it difficult to define priorities in order to establish preventive strategies. Economic and social impact of heart failure has warranted the necessity to have further information on these patients' profiles. The incidence of HF and

the number of hospital admissions have increased in recent years to such proportions as to become an important public health problem in India. Therefore, the present study was undertaken to assess the clinical manifestations of the patients with HF and to identify the most frequent risk factors associated with HF among the patients treated at Medicine ward in DMCH, Laheriasarai, Bihar.

### Material and Methods

This prospective observational study was undertaken among the 26 patients with an age range of 25 to 70 years (15 male + 11 female) admitted in the Medicine unit of Darbhanga Medical College and Hospital, Laheriasarai, Bihar from October 2020 to September 2021. All the patients fulfilled the European Society of Cardiology (ESC) criteria for Congestive Heart Failure (CHF). The sample size was established assuming a 95% confidence interval with 3% sampling error.

A structured proforma was designed to capture information on clinical profile of the patients and validated in the pilot study. The proforma consisted information on demographic, anthropometric and clinical data. Details of major cardiovascular risk factors such as smoking, alcohol intake, diabetes mellitus (DM), hypertension (HTN), ischemic heart disease (IHD), and hyperlipidemia were recorded. The physical examination included measurement of height, weight, waist-hip ratio (WHR) and blood pressure (BP).

Height was measured in centimeters and weight in kilograms using a calibrated spring balance. The supine waist girth was measured at the level of the umbilicus (during quite breathing) and the standing hip girth was measured at the inter-trochanteric

level. Jugular Venous Pressure (JVP) was measured in centimeters as 5+ (as the vertical distance from the top of the pulsation in the jugular veins to the angle of Louis). Patients were examined both at sitting and lying down positions with their head tilted at 45° and for abdomino-jugular reflux. Blood pressure was measured using standard mercury sphygmomanometer. 12 lead standard ECG was recorded using proper standardization. Chest X-ray was taken and cardio-thoracic ratio was calculated. Tran's thoracic echocardiography (TTE) was done in all cases. Patients were subjected to investigations and medical care as per the regular practice in the ward.

Further an attempt was made to quantify the problem of congestive HF in the community. Because of paucity of data this exercise may provide, at the best, an educated guess or a guesstimate.

Essential features: Symptoms of heart failures (e.g. breathlessness, fatigue, either at rest or during exertion, or ankles swelling) and objective evidence of cardiac dysfunction (at rest).

### Results

Prevalence of risk factors in the study population was shown in table 1 and 2. Smoking and alcoholism were the predominant risk factors followed by IHD and hypertension. The commonest symptoms observed among the HF patients were breathlessness. More than 90 percent of the subjects developed swelling in the foot. Around 50 percent of the subjects experienced cough and palpitation. The symptoms of chest pain, fatigue and giddiness was noticed in about 30 percent of the sample. Syncope was noticed to an extent of 19 percent respectively.

**Table 1: Relative frequency of risk factors for HF (n=26)**

Sl. No.	Risk Factor	Number	Percentage
1	Smoking	10	38.5
2	Alcohol	10	38.5
3	IHD	8	30.8
4	HTN	6	23.1
5	DM	2	7.7
6	Hyperlipidemia	1	3.8
7	Rheumatic fever	1	3.8

**Table 2: Relative frequency of symptoms in patients with HF (n=26)**

Sl. No.	Risk Factor	Number	Percentage
1	Breathlessness	26	100.0
2	Swelling of feet	24	92.3
3	Cough	15	57.7
4	Palpitation	13	50.0
5	Chest pain	9	34.6
6	Fatigue	8	30.8
7	Giddiness	7	26.9
8	Syncope	5	19.2

Mean values for anthropometry was presented in table 3. Average body mass index (BMI) in the study population was  $20.62 \pm 5.57$  kg/m<sup>2</sup> ranging between 11.34 and 30.48 respectively.

WHR was ranging between 0.78 and 1.02 with a mean value of  $0.91 \pm 0.06$ . Average systolic and diastolic blood pressure in the study population was  $130.38 \pm 25.43$  mmHg and  $89.46 \pm 17.00$  mmHg. Similarly average pulse pressure was  $42.84 \pm 16.25$  respectively. The frequency distribution of physical

examination parameters were shown in table 4. Edema foot was noticed in all the cases under investigation. JVD and Crackles were noticed to an extent of 92.3% and 80.3%.

Third heart sound, hepatomegaly, pallor and murmurs were noticed in 50% of the patients. Sacral edema was seen in 35% of the subjects followed by parasternal pulsation, flat note on percussion and cyanosis for about 15.3%, 11.5% and 3.8% respectively.

**Table 3: Anthropometry in patients with HF**

Criteria	Range	Mean	S.D.	Median
Weight (Kg)	32-84	54	12.8	53.5
Height (Meters)	140-173	159	9.55	158
BMI (Kgs/m <sup>2</sup> )	11.34-30.48	20.62	5.57	19.71
Waist circumference (cms)	34-95	75.19	14.40	74
Hip circumference (cms)	36-105	82.5	13.81	80.5
WHR	0.78-1.02	0.91	0.06	0.91
Pulse rate (bpm)	74-160	101.76	20.72	100
SBP (mmHg)	80-180	130.38	25.43	130
DBP (mmHg)	40-120	89.46	17.00	90
Pulse pressure (mmHg)	20-70	42.84	16.25	40

**Table 4: Relative frequency of symptoms in patients with HF (n=26)**

Sl. No.	Condition	Number	Percentage
1	Edema feet	26	100.00
2	JVD	24	92.3
3	Crackles	21	80.3
4	Third heart sound	15	57.7
5	Hepatomegaly	13	50.0
6	Pallor	12	46.1
7	Murmurs	12	46.1
8	Sacral edema	9	34.6
9	Parasternal pulsation	4	15.3
10	Flat note	3	11.5
11	Cyanosis	1	3.8

Results on the CXR, ECG and ECHO were shown in table 5. Among the CXR findings: cardiomegaly was noticed among 77% of the patients. Around 23 percent of the subjects reported with failure changes.

No changes were reported among 31% of the patients. Among the ECG findings: 27% were noticed with LVH and arrhythmias (Atrial fibrillation 19.2% and premature beats 7.6%) followed by ischaemic changes 23%, others 19%, RVH 7.6%, LBBB and RBBB each 3.8% respectively.

In the ECHO findings: EF of  $\geq 40$  was noticed among 69% and  $< 40$  was noticed in 27% of the subjects. Further hypokinesia and chamber enlargement was noticed for about 47% and 31%

respectively. Prevalence data on congestive heart failure in medical OPD and community setting was shown in table 6.

In medical OPD, 2% of the subjects noticed with heart failure. HF was below 2% in 25 – 59 years age group and it was 5.35% in those aged above 60 years. Similarly in Geriatrics OPD: 5% of the patients had HF; in emergency OPD: 4.5% of the patients had HF in the age group of 15 – 59 years and 27% of patients in those above 60 years subjects.

In the field survey, 0.5% had HF in the age group of 25- 59 years and 1.7% among those  $\geq 60$  years. The frequency of HF was found to be 3% in old age homes.

**Table 5: Relative frequency and percentage findings on CXR, ECG and ECHO**

Sl. No.	Risk Factor	Number	Percentage
<b>CXR</b>			
1	Cardiomegaly	20	76.9
2	Failure changes	6	23.1
3	No changes	8	30.7
<b>ECG</b>			
1	LVH	7	
2	Arrythmias	7	
	Arterial Fibrillatin	5	
	Premature beats	2	
3	Ischemic changes	6	
4	Others	5	
5	RVH	2	
6	LBBB	1	
7	RBBB	1	
<b>ECHO</b>			
1	EF		
	≥40	18	69.2
	<40	7	26.9
2	Hypokinesia	12	46.9
3	Chamber enlargement	8	30.8

**Table 6:Data on the prevalence of congestive heart failure in medical OPD and community setting**

Age	Number screened	Heart failure	Percentage
<b>Medical OPD</b>			
25-59	718	12	1.67
≥60	56	3	5.35
Total	774	15	1.91
<b>Geriatric OPD</b>			
≥60	309	15	4.85
<b>Emergency OPD</b>			
25-59	179	8	4.46
≥60	22	6	27.27
Total	201	14	6.96
<b>Field survey data on 150 households</b>			
25-59	389	2	0.51
≥60	59	1	1.69
Total	448	3	0.67
<b>Old age homes</b>			
≥60	63	2	3.17

### Discussion

The present study sought to examine the clinical profile of the patients with heart failure. The results clearly indicate that the most susceptible for developing HF was > 60 years and our results were in best agreement with the findings from Framingham study [6]. The common risk factors associated with HF was found to be smoking, alcohol abuse, ischemic heart disease and hypertension. Though the data from Framingham study shows that systolic arterial hypertension and CAD were the main risk factors for the development of HF, but in our HF patients smoking and alcoholism preceded over the hypertension and ischemic heart disease. Similar observations were reported by Firmida, et al. [7] and Nogueira,

Discussion et al[5]. Ferreira, et al. [8] study reported that valvular disease, CAD and HTN were the predominant risk factors for developing HF. The relative risk of death in patients with decompensated HF was low pulse pressure [9]. On the other side high pulse pressure may lead to unrecognized thyrotoxicosis or anemia. An increase in respiratory rate (usually > 16 breaths/minute) accompanies dyspnoea, and may signal the onset of acute decompensation of stable HF [10].

In the present sample average respiratory rate was found to be 26.3. Dyspnoea and edema were the predominant symptoms besides fluid overload with which the patients presented themselves to the hospital as observed by ADHERE study and Euro Heart Failure survey. This establishes the primacy

of breathlessness, as a presenting symptom of Heart failure. The cardinal symptoms of HF were shortness of breath and fatigue that occur either with rest and/or with exertion [10]. Hence, elucidating the history and physical examination to determine whether the patient is in natural history of syndrome or will have sizeable effect in offering treatment. Non-productive cough was the next most prevalent symptom, which is a dyspnoea equivalent and may suggest LVD [11]. Cough was present in 57.7% of patients in the present study against 69% in a US National Health Interview Survey [11].

The other important symptom was palpitation. This may be a presenting symptom in patients with decompensated HF. The character of palpitation may serve to identify the nature of underlying arrhythmias. Sensation of pauses and skipped or forceful beats suggest premature atrial or ventricular complexes. Rapid palpitations can be irregular as with atrial arrhythmias, such as atrial flutter, fibrillation or tachycardia or regular suggesting sinus supraventricular, or ventricular tachycardia. Arrhythmias are well known precipitants of HF (especially AF) and in the present study arrhythmias were seen in 26.9% and AF in 19.2% of patients.

In the present study, chest pain was found in 34.6% of patients. Fatigue was another common complaint in patients with HF. Evangelesta, et al. [12] study observed 50.4% of men and 51.2% of women with heart failure reported with fatigue. Measuring the heart rate is critical in the initial assessment of patients because decompensation may be due to bradycardia or tachycardia. But tachycardia is said to be too insensitive to have any useful predictive value [13].

The strength of pulse is also important for assessing the adequacy of cardiac output. Alteration in intensity of the pulse from strong to weak (mechanical alternans) has been shown to be common in HF and is associated with abnormal cardiac structure and function. Inequality of peripheral pulses may give a clue about the presence of CAD.

Physical examination revealed tachycardia in 57.7% in the present study. Watson, et al [13] opined that edema is too insensitive to have any useful predictive value. All of the patients in the study reported with edema. JVP is the most useful physical finding for detecting decompensated HF and has high specificity. Elevated JVP is independently associated with adverse outcomes, including progression of HF as observed in the present study [14].

Francis [15] study reported third heart sound in patients with advanced heart failure as noticed in the present study. Further increased cardiothoracic ratio was noticed in our patients. A complete

normal ECG has a high negative predictive value for HF (> 90%) [16].

In Euro Heart Failure survey, 10% of patients presented with AF14 against 19.2% in the present study, and the results were in accordance with CHARM trials [17]. ECHO evidence of LVH will remain an independent predictor of adverse events. Thus, it is possible to define a pattern of signs and symptoms and a profile of investigations in patients with HF. The reported data on anthropometry of the study population is in line with other population groups [18].

## Conclusion

This study provides a fairly comprehensive clinical profile of the patients with heart failure. Ischemic heart disease and hypertension are the leading risk factors, apart from smoking and alcoholism and the management of comorbid conditions may have sizeable effect in the clinical management.

## References

1. Hunt SA., et al. "2009 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* 119.14 (2009): e391-e479.
2. Schocken DD., et al. "Prevalence and mortality rate of congestive heart failure in the United States". *Journal of the American College of Cardiology* 20.2 (1992): 301-306.
3. Vasan R and Levy D. "Defining diastolic heart failure. A call for standardized diagnostic criteria". *Circulation* 101.17 (2000): 2118-2121.
4. Masoudi FA., et al. "The burden of chronic congestive heart failure in older persons: magnitude and implications for policy and research". *Heart Failure Reviews* 7.1 (2002): 9-16.
5. Nogueira PR., et al. "Epidemiological, clinical and therapeutic profile of heart failure in tertiary hospital". *Arquivos Brasileiros de Cardiologia* 95.3 (2010): 392-398.
6. Ho KKL., et al. "The epidemiology of heart failure: the Framingham study". *Journal of the American College of Cardiology* 22.4A (1993): 6A-13A.
7. Firmida CC and Mesquita ET. "O paradoxo do tratamento da ICC com beta bloqueadores: implicações para pacientes hipertensos". *Revista Brasileira De Hipertensão* 8.4 (2001): 458-465.
8. Ferreira A., et al. "Epidemiologic features of congestive heart failure. Retrospective analysis of 2561 hospitalizations". *Revista Portuguesa de Cardiologia* 15.5 (1996): 395-410.

9. Petrie CJ., et al. "Low pulse pressure as a poor-man's indicator of a low cardiac index in patients with severe cardiac dysfunction". *Journal of Cardiovascular Medicine* 15.4 (2014): 315-321.
10. Hummel A., et al. "De Novo Acute Heart Failure and Acutely Decompensated Chronic Heart Failure". *Deutsches Ärzteblatt International* 112.17 (2015): 298-310.
11. Hanyu Ni. "Prevalence of Self-Reported Heart Failure Among US Adults: Results from the 1999 National Health Interview Survey". *American Heart Journal* 146.1 (2003): 121-128.
12. Evangelista LS., et al. "Correlates of Fatigue in Patients with Heart Failure". *Progress in Cardiovascular Nursing* 23.1 (2008): 12-17.
13. Watson RD., et al. "ABC of heart failure. Clinical features and complications". *British Medical Journal* 320.7229 (2000): 236- 239.
14. Drazner MH., et al. "Prognostic importance of elevated jugular venous pressure and a third heart sound in patients with heart failure". *New England Journal of Medicine* 345.8 (2001): 574-581.
15. Francis GS. "Pathophysiology of chronic heart failure". *American Journal of Medicine* 110.7A (2001): 37S-46S.
16. Remme WJ and Swedberg K. "Guidelines for the diagnosis and treatment of chronic heart failure". *European Heart Journal* 22.17 (2001): 1527-1560.
17. Hawkins NM., et al. "Prevalence and prognostic implications of electrocardiographic left ventricular hypertrophy in heart failure: evidence from the CHARM programme". *Heart* 93.1 (2007): 59-64.
18. Reddy TM., et al. "Metabolic Profile and Body Fat Distribution in Diabetic Hypertensives and Normotensives". *Journal of Life Science* 5.1 (2013): 23-28.