

ORIGINAL RESEARCH

The Clinico-Etiological Profile of Elderly Patients Presenting With Heart Failure at a Tertiary Care Hospital

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Abstract

Aim: To analyse the clinico-etiological profile of heart failure in elderly patients.

Material and Methods: This prospective hospital based study was carried out for a period of 18 months among patients >60 years of age with heart failure on the basis of Boston Criteria was included in my study. Detailed history was obtained. Thorough & detailed clinical examination was done for all the patients. Boston criteria was used for screening the patients for Heart Failure. Patients falling in "Possible" category according to Boston Criteria was evaluated on the basis of 2-D Echo for the confirmation of diagnosis of Heart Failure. HFrEF is diagnosed by echocardiography when LVEF is <40%. Patients were followed till either discharge or death. Statistical analysis of data was done using appropriate statistical data.

Data was collected and subjected to statistical analysis.

Results: 67.39% subjects were having reduced ejection fraction (<40%). Patients with hypertension were more prone to heart failure i.e. 39.86% as compared to diabetes, which was found in 15.94%. Most common cardiac finding was secondary mitral regurgitation (36.96%) followed by atrial fibrillation (23.91%). Common clinical symptoms among the study subjects were dyspnea (98.55%) while common clinical signs as observed in the study were fine crepitations at lung bases, dependent oedema, elevated JVP and Gallop. The most common etiology among the study subjects was ischemic heart disease (56.52%).

Conclusion: Heart failure prevalence is increasing among elderly patients with co-morbid factors like coronary artery disease, hypertension, diabetes mellitus and obesity. Early recognition and treatment of these co-morbid conditions can reduce exacerbations of Heart Failure. Screening and counseling of patients with high risk factors is crucial in early diagnosis and treatment of heart failure.

Keywords: Heart failure, Elderly Patients, Mortality

Introduction: American College Of Cardiology Foundation (ACCF)/American Heart Association (AHA) guidelines define heart failure as complex clinical syndrome that results from structural or functional impairment of ventricular filling or ejection of blood, which in turn leads to the cardinal clinical symptoms of dyspnea and fatigue and signs of HF, namely edema and rales.

(1)Heart failure (HF) is the inability of the heart to adequately meet the metabolic demands of tissues, or do so only with elevated filling pressures.

(2)Heart failure (HF) is a complex clinical syndrome resulting from the inability of the heart to adequately supply the metabolic demands of tissues, or do so only with elevated filling pressures. The significant increase of life expectancies over the last few decades has lead to a major change in the morbidity and mortality profile of elders. HF is predominantly a disorder of the elderly with rates increasing exponentially with time. The prevalence of HF approximately doubles with each decade of life¹. This is due to progressive aging of the population, as well as the improvements in the HF survival over the years. In addition to its high prevalence, the disease also has a poor prognosis and high mortality rate in elderly patients. The 5-year mortality rate for 80-year-olds with HF is as high as 54.4%¹.

Patients aged ≥ 60 years with HF have a complex comorbidity and a high number of cardiovascular risk factors, which have a significant impact on the prognosis of the disease. Moreover, the effective treatment of chronic cardiovascular disorders, such as coronary artery disease (CAD), hypertension (HT), and diabetes mellitus (DM), may prevent the progression of HF¹.

Traditionally, HF has been defined as failure of the contractile function of the left ventricle. However, it is recognized that the HF symptoms can occur in the presence of normal or near-normal EF, which is defined as HF with preserved ejection fraction (HFpEF). HFpEF and HFrEF have different clinical characteristics and prognostic factors. Patients with HFpEF are more often female and are more likely to have Hypertension but less likely to have CAD. A recent meta-analysis suggests that patients with HFpEF may have a lower mortality rate than those with HFrEF. Although all these differences are well known to affect the prognosis and the clinical outcome of elderly patients with HF, there is not much evidence, especially considering those issues related to specific characteristics of the elderly with HFrEF and HFpEF¹.

The leading causes of HF in India include coronary artery disease (CAD), diabetes, hypertension, rheumatic valvular heart diseases and primary cardiac muscle diseases. Rheumatic heart disease (RHD) is still a common cause of HF in India, where the prevalence ranges from 6.0 to 11.0/1000, though there has been a significant decline in the prevalence of RHD in developed countries mainly due to improved socioeconomic conditions rather than any modern treatment methods. It is still very much prevalent in all parts of India and other developing and under developed nations of the world. It has been observed that amongst cardiovascular diseases, RHD accounts for 12-65% of all admissions in developing countries².

Also, population aging has clearly changed the epidemiological profile of heart failure patients. The typical elderly patient with comorbidities usually develops HFpEF, while signs and symptoms of heart failure are often non-specific and may not discriminate between heart failure and other medical conditions. The diagnosis of heart failure in elderly patients, especially in overweight and obese individuals, remains cumbersome and validated tools are missing. Furthermore, managing heart failure in the presence of cardiovascular and non-cardiovascular comorbidities brings particular challenges, and their presence has been identified as a major prognostic indicator for increased morbidity and mortality³. The aim of the present study was to analyse the clinico-etiological profile of heart failure in elderly patients.

Material and Methods: This prospective hospital based study was carried out for a period of 18 months among patients >60 years of age with heart failure on the basis of Boston Criteria was included in my study.

EXCLUSION CRITERIA

1. Patients with Chronic Obstructive Pulmonary Disease.
2. Patients not giving written informed consent.

Methodology

Ethical approval was obtained from the Institutional Ethical Committee prior to the data collection. All elderly patients of Heart Failure were enrolled in the study after a written, informed consent. Detailed history was obtained. Thorough & detailed clinical examination was done for all the patients. Boston criteria was used for screening the patients for Heart Failure. Patients falling in "Possible" category according to Boston Criteria was evaluated on the basis of 2-D Echo for the confirmation of diagnosis of Heart Failure.

Criterion	Point value
Category I: history	
Rest dyspnoea	4
Orthopnoea	4
Paroxysmal nocturnal dyspnoea	3
Dyspnoea while walking on level area	2
Dyspnoea while climbing	1
Category II: physical examination	
Heart rate abnormality (1 point if 91 to 110 beats per minute; 2 points if more than 110 beats per minute)	1 or 2
Jugular venous elevation (2 points if greater than 6 cm H ₂ O; 3 points if greater than 6 cm H ₂ O plus hepatomegaly or oedema)	2 or 3
Lung crackles (1 point if basilar; 2 points if more than basilar)	1 or 2
Wheezing	3
Third heart sound	3
Category III: chest radiography	
Alveolar pulmonary oedema	4
Interstitial pulmonary oedema	3
Bilateral pleural effusion	3
Cardiothoracic ratio greater than 0.50	3
Upper zone flow redistribution	2

Table 1: Boston Criteria (No more than 4 points are allowed from each of three categories; hence the composite score (the sum of the subtotal from each category) has a possible maximum of 12 points. The diagnosis of heart failure is classified as “definite” at a score of 8 to 12 points, “possible” at a score of 5 to 7 points, and “unlikely” at a score of 4 points or less)

HFrEF is diagnosed by echocardiography when LVEF is <40%. HFpEF is more difficult to diagnose and the diagnosis includes, in addition to HF symptoms and signs there should be a LVEF ≥50%, structural or functional signs of diastolic dysfunction or LV hypertrophy. These include either left atrial dilation (left atrial volume index ≥34 ml/m²), LV hypertrophy (left ventricular mass index ≥115 g/m² for men and ≥95 g/m² for women).

All the patients who fulfill the inclusion criteria was subjected to following investigations:

- a. CBC
- b. Serum Creatinine
- c. Serum Bilirubin, SGOT, SGPT
- d. Serum Electrolytes
- e. TSH
- f. HbA1c, Fasting Blood Glucose
- g. Chest X Ray
- h. ECG
- i. 2-D Echo.
- j. BNP / NT-pro BNP(as and when indicated)

Patients were followed till either discharge or death. Statistical analysis of data was done using appropriate statistical data.

Data was collected and subjected to statistical analysis.

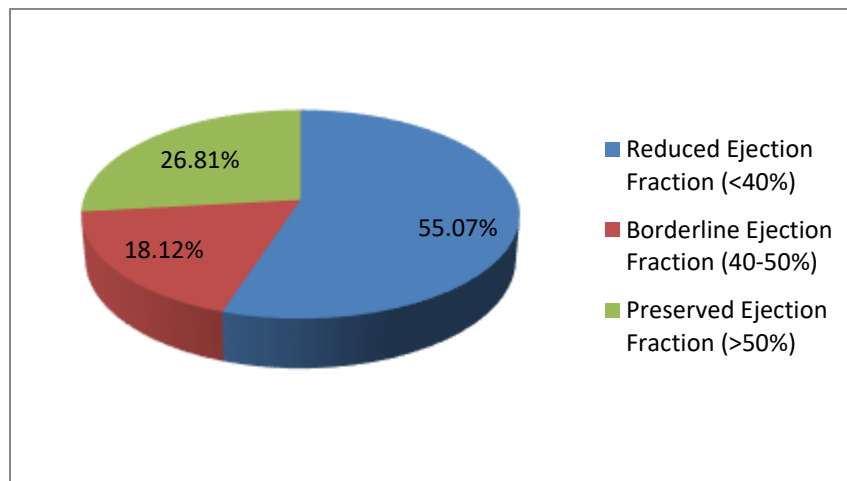
Statistical analysis: Data so collected was tabulated in an excelsheet, under the guidance of statistician using SPSS version 22.00 for windows; SPSS inc, Chicago, USA).

Results: The study population included 138 elderly patients admitted in emergency, medicine wards and ICU having symptoms of heart failure. Maximum subjects were males (70.29%) as compared to females (29.71%). 37.68%, 41.30% and 21.01% of the subjects belonged to age group of 61-65, 66-70 and >70 years respectively. NYHA class I, II, III and IV was reported among 8.70%, 16.67%, 47.83% and 26.81% of the subjects respectively (table 2).

Table 2: Gender, age and NYHA class among the study subjects

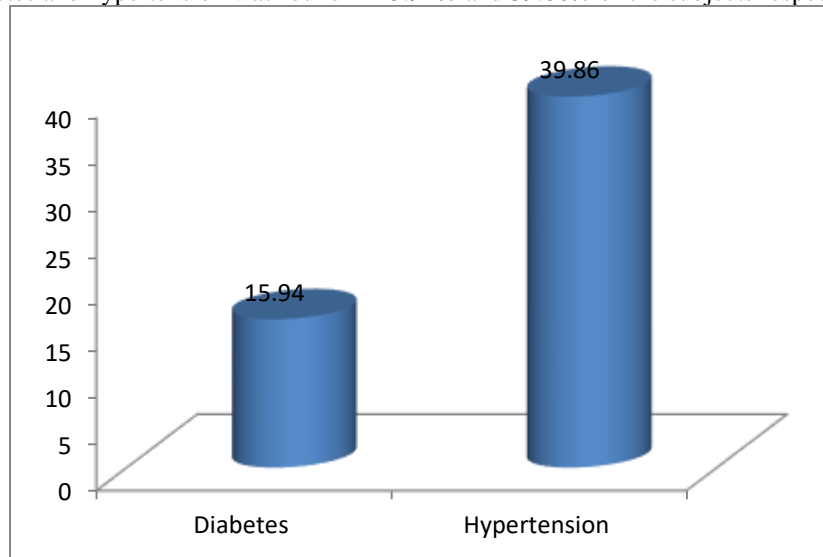
Gender	N=138	%
Male	97	70.29
Female	41	29.71
Age Group (in years)		
61-70	52	37.68
71-80	57	41.30
>80	29	21.01
NYHA class		
I	12	8.70
II	23	16.67
III	66	47.83
IV	37	26.81

Maximum subjects were having ejection fraction <40% (55.07%) followed by 40-50% (18.12%) while 26.81% of the subjects were having ejection fraction of >50% as shown in graph 1.



GRAPH 1: Ejection fraction among the study subjects

Diabetes and hypertension was found in 15.94% and 39.86% of the subjects respectively (graph 2).



Graph 2: Co-morbidities among the study subjects

Table 3 shows the cardiac findings on ECG and ECHO among the study subjects. Most common cardiac finding was secondary mitral regurgitation (36.96%) followed by atrial fibrillation (23.91%). Primary valvular heart disease was reported in 17.39% of the subjects respectively.

Table 3: Cardiac findings on ECG and ECHO among the study subjects

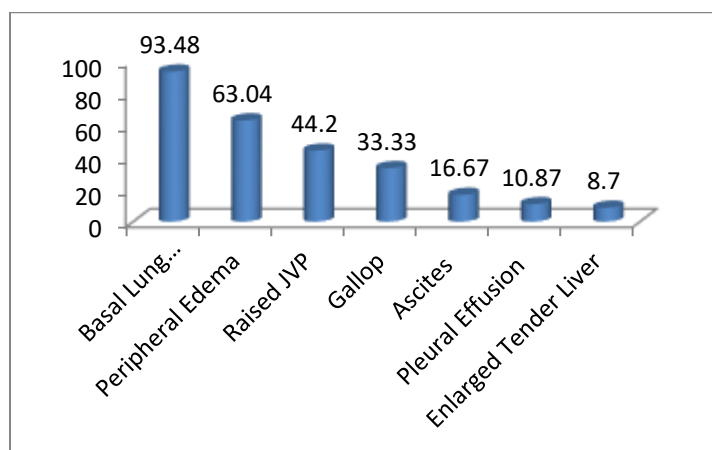
Cardiac Findings	N	%
Primary valvular heart disease	24	17.39
IHD	51	36.96
Atrial fibrillation	33	23.91
LBBB	12	8.69
RBBB	5	3.62

Common clinical symptoms among the study subjects were dyspnea followed by orthopnea, paroxysmal nocturnal dyspnea and fatigue. Weight gain was observed in 12.32% while palpitation was present in 34.78% of the subjects respectively (table 4).

Table 4: Clinical symptoms among the study subjects

Symptoms	N	%
Dyspnea	136	98.55
Orthopnea	113	81.88
Paroxysmal Nocturnal Dyspnea	77	55.80
Fatigue	63	45.65
Chest Pain	62	44.93
Palpitation	48	34.78
Weight Gain	17	12.32

Basal lung crepitations, peripheral edema, raised JVP, gallop, ascites, pleural effusion and enlarged tender liver was found in 93.48%, 63.04%, 44.20%, 33.33%, 16.67%, 10.87% and 8.70% of the subjects respectively. Hence the most common clinical sign was basal lung crepitations (graph 3).



GRAPH 3: Clinical signs among the study subjects

The most common etiology among the study subjects was ischemic heart disease (56.52%) followed by hypertensive heart disease (19.57%) and cardiomyopathy (11.59%). Chronic corpulmonale and myocarditis was reported among 2.90% and 1.45% of the subjects respectively (table 5).

Table 5: Etiology among the study subjects

Etiology	N	%
Ischemic Heart Disease	78	56.52
Hypertensive Heart Disease	27	19.57
Cardiomyopathy	16	11.59
Chronic CorPulmonale	4	2.90
Myocarditis	2	1.45

Discussion:

Heart failure is a common cardiovascular condition with increasing incidence and prevalence, which is a frequently encountered illness but conflicting data exists about its rate of occurrence in general population, relative frequencies of predisposing Heartdisease and the prognosis for the patients in whom Heart Failure develops.

Heart failure is a worldwide health problem predominantly in elderly persons. Unlike western countries where heart failure is predominantly a disease of elderly; in India it also affects younger age group. The prevalence and aetiology of heart failure has been previously incompletely described in Indian population due to absence of surveillance programmes to track incidence, prevalence, causes etc⁴.

Maximum subjects were males (70.29%) as compared to females (29.71%) in this study. Similarly Sohan Kumar Sharma et al⁵ in their study mentioned male dominance. Ewa A. Jankowska too revealed more males as compared to females⁶. ShripadVithalraoDhanorkaret al⁷ in their study similarly found that male to female ratio was 1.4:1.

In the present study; 37.68%, 41.30% and 21.01% of the subjects belonged to age group of 61-65, 66-70 and >70 years respectively. Ewa A. Jankowska too revealed mean age of 61 years among the study subjects⁶. Sohan Kumar Sharma et al⁵ too in their study reported that mean age of the study subjects was 63.3±14.4 years. Vishal Gupta et al⁸ in their study found that 51.79% patients were in the age group of 60-70 yrs, 42.86% were in the age group of 71-80 yrs and 5.35% were in the age group of >80 years.

In this study; maximum subjects were having ejection fraction <40% (55.07%) followed by 40-50% (18.12%) while 26.81% of the subjects were having ejection fraction of >50%. In a study by Sohan Kumar Sharma et al⁵, mean EF was 38±12%. Vishal Gupta et al⁸ in their study found that based on Ejection fraction on 2D Echocardiography Diastolic HF (EF >40%) was seen in 30 patients (53.57%) while systolic dysfunction was seen in 26 patients (46.43%). Diabetes and hypertension was found in 15.94% and 39.86% of the subjects respectively.

Similar distribution of co-morbidities was revealed by Sohan Kumar Sharma et al⁵ in their study.

According to Shripad Vithalrao Dhanorkaret al⁷, hypertension (67%), coronary artery disease (53%), diabetes mellitus (47%), hyperlipidemia (42%) was present commonly in heart failure patients. Hypertension is the most common cause of heart failure according to Framingham cohort study. The prevalence of other risk factors of heart failure is also increasing in India. In addition to the older population as explained above, the prevalence of hypertension is estimated to increase from 118 million (2000) to 214 million (2025). If the annual incidence of heart failure in patients with a systolic blood pressure (SBP) of 144-154 mmHg is 0.1% to 0.6%, as established in the hypertension optimal treatment (HOT) and United Kingdom prospective diabetes study (UKPDS) trials, respectively, then the number of new heart failure cases due to hypertension may increase from 118000-708000 per year in 2000 to 214000-1.3 million per year in 2025⁹.

Most common clinical symptoms among the study subjects was dyspnea followed by orthopnea, paroxysmal nocturnal dyspnea and fatigue. Weight gain was revealed in 12.32% while palpitation was shown in 34.78% of the subjects respectively. Vishal Gupta et al⁸ in their study found that the most common symptom was dyspnea seen in all patients followed by fatigue (58.9%) and pedal edema (53.6%). The other symptoms were Orthopnea and paroxysmal nocturnal dyspnea (PND) seen in 42.9% each. Similar clinical symptoms were reported by ShripadVithalraoDhanorkaret al⁷ in their study. Dyspnea (97%), Orthopnoea (77%), Paroxysmal nocturnal dyspnoea (61%), Easy fatigability (58%), Chest pain (47%), Palpitation (35%) were most common symptoms noted in heart failure patients.

The classical clinical symptoms of heart failure are exertion dyspnoea, orthopnea, paroxysmal nocturnal dyspnoea, fatigue and the signs are elevated jugular venous pressure, pulmonary rales, third heart sound and peripheral oedema. No single symptom or sign is pathognomic of heart failure. Symptoms of heart failure are exertional dyspnea, orthopnea, paroxysmal nocturnal dyspnea, sensitivity of these symptoms is 23–66%, specificity 50–80%¹⁰.

The most common etiology among the study subjects was ischemic heart disease (56.52%) followed by hypertensive heart disease (19.57%) and cardiomyopathy (11.59%). Pulmonary hypertension and myocarditis was reported among 2.90% and 1.45% of the subjects respectively. According to ShripadVithalraoDhanorkaret al⁷, ischemic heart disease (56%), hypertensive heart disease (22%), cardiomyopathy (11%) and valvular heart disease (8%) were most common etiology of heart failure. Vishal Gupta et al⁸ in their study found that the most common risk factor for heart failure was hypertension (seen in 73.21%), Ischemic heart disease (seen in 52% patients) and Diabetes mellitus (seen in 26.78%). Since patients have uneven and limited access to healthcare in India, the healthcare infrastructure itself may play a role in the rising burden of HF. The public healthcare system is often overloaded, which makes access to basic services difficult. India has <2% penetration of health insurance (government employee are an exception), making the out of-pocket costs for prevention of HF relatively expensive. Emergency services are not widely available in India, such that patients who experience acute cardiac events, such as acute coronary syndrome (ACS), typically have longer symptom-to-door and door-to-needle times than in other countries. This combination of inaccessibility, unaffordable treatment and treatment delay possibly increases the incidence of HF in India².

Limitations of the study

This study was a single-center study conducted at a tertiary care center. India being a vast country with different cultures and food habits, it is difficult to generalize the findings necessitating multicenter larger studies. Secondly, the observational character of our study needs to be acknowledged. No controls were taken to compare in subjects with or without HF.

Conclusion: Heart failure prevalence is increasing among elderly patients with co-morbid factors like coronary artery disease, hypertension, diabetes mellitus and obesity. Early recognition and treatment of these co-morbid conditions can reduce exacerbations of Heart Failure. Screening and counseling of patients with high risk factors is crucial in early diagnosis and treatment of heart failure. The results of this study can help in facilitating early recognition, better long term management and prevention of exacerbations of heart failure. Clinical and etiological profile of heart failure in elderly patients in this region as identified in this study is likely to enhance understanding of heart failure and thus facilitate early recognition and better management of heart failure.

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