

Study of clinical and etiological profile of congestive heart failure in a tertiary care hospital

Shripad Vitthalrao Dhanorkar¹, Rajabhau Vishwanathrao Galande (Patil)^{2*}

¹Professor, Department of General Medicine, Pacific Institute of Medical Sciences, Udaipur, Rajasthan, INDIA.

²Consulting Senior Physician, Washi, Dist. Osmanabad, Maharashtra, INDIA.

Email: svdhanorkar@gmail.com, karadbalasaheb@gmail.com

Abstract

Background: Heart failure is a common cardiovascular disease with high morbidity and mortality. Important risk factors include coronary artery disease, hypertension, diabetes mellitus, valvular heart disease and cardiomyopathies. Patients with HF in India are younger, sicker and have a much higher morbidity and mortality as compared to their western counterparts. Heart failure is associated with shorter life expectancy, increased frequency of hospitalization and poor quality of life (QoL), and is a major public health challenge in India. Present study was aimed to evaluate clinical and etiological profile of congestive heart failure patients in a tertiary care hospital. **Material and Methods:** This prospective, observational study was conducted in department of medicine, on patients aged > 18 years old with a diagnosis of heart failure. Patients with chronic obstructive pulmonary disease, congenital heart disease were excluded. **Results:** Total 112 patients were included in present study. Heart failure was commonly seen after 45 years age (71 %) and in male patients (58 %). Male to female ratio was 1.4:1. Mean age of patients was 53.91 ± 11.23 years. Hypertension (67%), coronary artery disease (53%), diabetes mellitus (47%), hyperlipidemia (42%) was present commonly in heart failure patients. Dyspnea (97%), Orthopnea (77%), Paroxysmal nocturnal dyspnea (61%), Easy fatiguability (58%), Chest pain (47%), Palpitation (35%) were most common symptoms noted in heart failure patients. Common clinical signs were basal lung crepitations (93%), peripheral edema (58%), raised JVP (44%), gallop rhythm (34%) and ascites (19%). Ischemic heart disease (56%), hypertensive heart disease (22%), cardiomyopathy (11%) and valvular heart disease (8%) were most common etiology of heart failure in present study. In present study acute coronary syndrome (26%), non-compliance with medications (19%), uncontrolled hypertension (15%), infection (13%) and unknown (9%) were common precipitating causes of heart failure. We noted 14% mortality in present study. We advised heart transplant in 8% patients. **Conclusion:** Heart failure is nowadays routinely seen, especially in age above 45, with co-morbid factors like coronary artery disease, hypertension, diabetes mellitus, cardiotoxic drugs, valvular heart disease and obesity. **Key Words:** heart failure in India, ischemic heart disease, hypertension, precipitating conditions

*Address for Correspondence:

Dr. Rajabhau Vishwanathrao Galande (Patil), Consulting Senior Physician, Washi, Dist. Osmanabad, Maharashtra, INDIA.

Email: karadbalasaheb@gmail.com

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INTRODUCTION

Heart failure is a complex clinical syndrome that underlines the inability of the heart to perform its circulatory function with the desired efficiency due to

structural and/or functional (systolic or diastolic) alterations¹. Heart failure (HF) is a major problem in the West and is likely to become a major problem in India. As per projections there are at least 8–10 million patients with HF in India with a prevalence of about 1% adult population². Heart failure (HF) has an estimated global prevalence of approximately 26 million and is a leading cause of morbidity and mortality and therefore is a global health care problem^{3,4}. In India prevalence estimates vary widely between 1.3 and 23 million⁵. Heart failure is a common cardiovascular disease with high morbidity and mortality. Important risk factors include coronary artery disease, hypertension, diabetes mellitus, valvular heart disease and cardiomyopathies. HF is predominantly a disorder of the elderly with rates increasing exponentially with time. The prevalence of HF approximately doubles

with each decade of life⁶. Patients with HF in India are younger, sicker and have a much higher morbidity and mortality as compared to their western counterparts. Heart failure is associated with shorter life expectancy, increased frequency of hospitalization and poor quality of life (QoL), and is a major public health challenge even in India⁷. Prevalence of heart failure is increasing in India because of rise of coronary artery disease and persistence of pretransition disease like Rheumatic heart disease (RHD), endomyocardial fibrosis etc⁸. Early identification of the risk factors and initiation of appropriate therapy at early stages prevents development of heart failure. Clinical diagnosis and diagnostic imaging, echocardiogram in particular identifies patients with heart failure. The optimum utilization of the available drugs, general measures and surgical procedures appropriate to the condition improves the outcome of these patients. Present study was aimed to evaluate clinical and etiological profile of congestive heart failure patients in a tertiary care hospital.

MATERIAL AND METHODS

This prospective, observational study was conducted in department of medicine, XXX medical college, XXX. Study duration was 12 months. Ethical approval was obtained from Institutional Ethics Committee. Patients aged > 18 years old with a diagnosis of heart failure were included in present study. Patients with chronic obstructive pulmonary disease, congenital heart disease were excluded. Subjects satisfying inclusion and exclusion criteria were recruited in the study after obtaining written informed consent. A detailed history was recorded in addition to a thorough clinical examination, and routine and specific laboratory investigations were done. Patients demographic data, comorbidities, risk factors, clinical presentation, investigations, medication history, interventions, etiology, and precipitating factors for heart failure were recorded. Patients were all followed till either discharge or death. Descriptive statistics were used to summarize the data. For categorical variables, frequencies and percentages were reported. For continuous variables, mean and standard deviation (SD) were used to summarize the data.

RESULTS

Total 112 patients were included in present study. Heart failure was commonly seen after 45 years age (71 %) and in male patients (58 %). Male to female ratio was 1.4:1. Mean age of patients was 53.91 ± 11.23 years.

Table 1: Age and gender distribution

Age group (in years)	Male (%)	Female (%)	Total (%)
18-25	3 (3%)	2 (2%)	5 (4%)
26-35	6 (5%)	3 (3%)	9 (8%)
36-45	11 (10%)	7 (6%)	18 (16%)
46-55	14 (13%)	11 (10%)	25 (22%)
56-65	18 (16%)	13 (12%)	31 (28%)
66-75	9 (8%)	8 (7%)	17 (15%)
>75	4 (4%)	3 (3%)	7 (6%)
Total	65 (58%)	47 (42%)	112
mean ±SD	53.91 ± 11.23		

Hypertension (67%), coronary artery disease (53%), diabetes mellitus (47%), hyperlipidemia (42%) was present commonly in heart failure patients. Other less common factors were valvular heart disease (13%), CKD/dialysis (12%), smoking (12%), atrial fibrillation (10%), stroke/TIA (8%), alcohol (3%).

Table 2: Medical history

Medical history	Number of patients	Percentage
Hypertension	75	67%
Coronary Artery Disease	59	53%
Diabetes mellitus	53	47%
Hyperlipidemia	47	42%
Valvular heart disease	14	13%
CKD/dialysis	13	12%
Smoking	13	12%
Atrial fibrillation	11	10%
Stroke/TIA	9	8%
Alcohol	3	3%

Dyspnea (97%), Orthopnoea (77%), Paroxysmal nocturnal dyspnoea (61%), Easy fatiguability (58%), Chest pain (47%), Palpitation (35%) were most common symptoms noted in heart failure patients.

Table 3: Clinical features- Symptoms

SYMPTOMS	Number of patients	percentage
Dyspnea	109	97%
Orthopnoea	86	77%
Paroxysmal nocturnal dyspnoea	68	61%
Easy fatiguability	65	58%
Chest pain	53	47%
Palpitation	39	35%
Weight gain	14	13%

Common clinical signs were basal lung crepitations (93%), peripheral edema (58%), raised JVP (44%), gallop rhythm (34%) and ascites (19%).

Table 4: Clinical features- Signs

SIGNS	Number of patients	Percentage
Basal lung crepitations	104	93%
Peripheral edema	65	58%
Raised JVP	49	44%
Gallop	38	34%
Ascites	21	19%
Signs of pleural effusion	16	14%
Enlarged tender liver	15	13%

According to New York heart Association criteria 6%, 14%, 46%, 29% and 4% were belonging to class I.II.III.IV and unknown class respectively.

Table 5: Distribution according to NYHA class

NYHA class	Number of patients	Percentage
NYHA I	7	6%
NYHA II	16	14%
NYHA III	52	46%
NYHA IV	32	29%
NYHA not known	5	4%

Ischemic heart disease (56%), hypertensive heart disease (22%), cardiomyopathy (11%) and valvular heart disease (8%) were most common etiology of heart failure in present study.

Table 6: Etiology of heart failure

Etiology	Number of patients	percentage
Ischemic heart disease	63	56%
Hypertensive heart disease	25	22%
Cardiomyopathy	12	11%
Valvular heart disease	9	8%
Pulmonary hypertension	2	2%
Myocarditis	1	1%

In present study acute coronary syndrome (26%), non-compliance with medications (19%), uncontrolled hypertension (15%), infection (13%) and unknown (9%) were common precipitating causes of heart failure.

Table 7: Precipitating causes

Precipitating causes	Number of patients	%
Acute coronary syndrome	29	26%
Non-compliance with medications	21	19%
Uncontrolled hypertension	17	15%
Infection	14	13%
Unknown	10	9%
Uncontrolled arrhythmias	8	7%
Worsening renal failure	7	6%
Anemia	5	4%
Pulmonary embolism	1	1%

Patients required multiple interventions during hospitalisation. We noted infection requiring therapy (19%), inotropes (17%), intubation/ventilation (14%), blood transfusion (8%), NIV (7%), AF/VT requiring therapy (7%), acute dialysis/ultrafiltration (5%), valve repair/replacement (4%) and IABP (1%) interventions in present study.

Table 8: Interventions needed

Interventions required during treatment	Number of patients	Percentage
Infection requiring therapy	21	19%
Inotropes	19	17%
Intubation/ventilation	16	14%
Blood transfusion	9	8%
NIV	8	7%
AF requiring therapy	8	7%
Acute dialysis/ultrafiltration	6	5%
VT/VF requiring therapy	5	4%

Valve repair/replacement	5	4%
IABP	1	1%

We noted 14% mortality in present study. We advised heart transplant in 8% patients.

DISCUSSION

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 pressures¹⁰. Acute HF is the rapid onset or worsening of HF, has a very high mortality in India and is commonly due to systolic dysfunction due to ischemic heart disease (IHD) or cardiomyopathies (commonly dilated cardiomyopathy), uncontrolled hypertension or other causes, and valvular heart disease commonly rheumatic. By the Global Burden of Disease 2001 Estimates, the mortality due to hypertensive heart disease in South Asia region is about 90,000/annum and a significant proportion of which is likely to be due to HF (other major reason being sudden cardiac death)¹¹. The classical clinical symptoms of heart failure are exertional 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%¹². Clinical findings alone are usually inadequate to differentiate systolic heart failure from diastolic heart failure. There is an inconsistent relationship of the symptoms and signs of heart failure to hemodynamic parameters like left ventricular end-diastolic pressure, cardiac index and ventricular function. The diagnosis of heart failure is mainly clinical but various investigations help us to understand the underlying cause and assessment of severity of heart failure. The most useful and widely used test to establish the diagnosis of HF is echocardiography¹³. A detailed echocardiographic examination would provide information about the structure and function of the heart hence, 2D echocardiography is the cornerstone of HF diagnosis. Patients with acutely decompensated HF commonly present in the emergency setting and require urgent management. Admission to hospital for ADHF is a powerful predictor of readmission and post discharge death in patients with chronic HF^{14,15}. Therefore, identification and appropriate management of these patients is crucial for improving outcomes. In a study from the UK, about 20% of the community surveyed were above 65 years of age. However, 80% of incident HF were in this age group¹⁶. Similarly, in the USA, the population above 65 years of age is about 12%¹⁶. In India,

the prevalence of old age >65 years is about 5.5% or about 70 million individuals¹⁷. The Trivandrum HF registry (THFR) enrolled 1205 admissions for HF (834 men, 69%). The mean age was 61.2 years. The most common etiology of HF was ischemic heart disease (72%). HF with preserved ejection fraction (HF_pEF) constituted 26%¹⁸. Patients with HF in the Trivandrum HF registry were younger, and had a higher prevalence of CAD¹⁸. In another study from AIIMS¹⁹, adults of six villages in Northern India were screened, and cases of dyspnea were identified by trained health workers. Of 10,163 cases screened, chronic breathlessness was present in 128 (1.3%). Echocardiography was performed in all and HF was diagnosed in 12 of them. Thus, the prevalence of HF in this rural community was estimated to be 1.2/1000. Two-thirds of the patients had HF_pEF and all of them had uncontrolled hypertension (HTN). The important risk factors for heart failure include coronary artery disease, hypertension, diabetes mellitus, cardiotoxic drugs, valvular heart disease and obesity. In India coronary artery disease, diabetes, hypertension, valvular heart diseases, rheumatic heart disease and primary muscle diseases are the leading causes for heart failure²⁰. Ischemic heart disease (56%), hypertensive heart disease (22%), cardiomyopathy (11%) and valvular heart disease (8%) were most common etiology of heart failure in present study. Euro Heart Failure Survey II (EHFS II) and the Italian registry, which showed that younger HF patients frequently presented with acute pulmonary edema, cardiogenic shock, and uncontrolled hypertension, with ACS as a predominant precipitating factor^{21,22}. The majority of patients presented with acute HF and old age with co-morbidities such as hypertension, coronary artery disease, diabetes mellitus, hyperlipidemia, atrial fibrillation, valvular heart disease, and prior stroke/transient ischemic stroke, indicating uncontrolled severe comorbid conditions and precipitating factors leading to recurrent hospitalizations with decompensated acute HF. In a study of admitted patients of HF²³, most common etiology was CAD (55%) followed by valvular heart disease (13%), idiopathic dilated cardiomyopathy (10%), and hypertensive heart disease (6%). HF of unknown etiology was present in 12% of all patients. In a reported study of 100 new or operated RHD patients from Chennai, the prevalence of CHF was 24%²⁴. In present study, non-compliance with medications was noted in 19%. With all the available therapies available in India, medication adherence is a major problem, appropriate medications are given to only 25% of the patients, and mortality of admitted patients is as high as 30%. Therefore, we need to put the treatments together for each patient, and disease management programs,²⁵ HF nurses, and HF clinics are useful in this

direction. We noted 14% mortality in present study. In a study from North India in patients with ADHF, in-hospital mortality was 30.8% and the majority of in-hospital deaths was due to progressive HF. Cumulative 1- and 3-month mortality rates of discharged patients were 15.8% and 26.3, respectively²⁶. In the Framingham follow-up study, the 30-day and 5-year rates of HF were 23% and 32 in the decade 1990–1999 after MI%, respectively²⁷. The ACC/AHA guidelines²⁸ emphasize (i) careful history and physical examination, (ii) laboratory investigations including complete blood count, test of renal and hepatic functions, urine-analysis, electrocardiogram and chest x-ray, (iii) two dimensional and Doppler echocardiogram (iv) careful exclusion of coronary artery disease and thyroid disease in all patients, and (v) selective use of other diagnostic tests including serologic studies in selected patients based upon the clinical characteristics, risk factors, past medical and family history. We have to identify the risk factors for the development of heart failure and their prevention with an aim to reduce the incidence and burden of heart failure. Hypertension, diabetes mellitus, coronary artery diseases and rheumatic heart diseases are the most important risk factors. Physical activity, dietary control and lifestyle modification can drastically bring down some of these modifiable risk factors and reduce the load of heart failure²⁹.

CONCLUSION

Heart failure is nowadays routinely seen, commonly in age above 45, with co-morbid factors like coronary artery disease, hypertension, diabetes mellitus, cardiotoxic drugs, valvular heart disease and obesity. Heart failure is definitely preventable condition. Screening of high-risk patients and counselling of patients with high risk factors is crucial in early diagnosis and treatment of heart failure.

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