

## A Clinical Study of Chronic Heart Failure in a Tertiary Care Hospital of Telangana

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**Abstract:** Heart failure is the end stage of all diseases of the heart and is a major morbidity and mortality. Unfortunately, heart failure may be difficult to diagnose clinically, as many features of the condition are nonspecific. The overall incidence is likely to increase in the future because of both an aging population and therapeutic advances in the management of acute myocardial infarction leading to improved survival in patients with impaired cardiac function. Aim: the various clinical manifestations of Chronic Heart Failure and to identify the major etiological and risk factors of Chronic Heart Failure. Methods: This study was conducted in the Department of General Medicine and Cardiology, Prathima Institute of Medical Sciences, Naganoor, Karimnagar. Institutional Ethical committee Permission was obtained for the study. A total of 50 patients with symptoms of heart failure were included in the study. All patients selected were subjected to detailed history, clinical examination and investigations. Complete Hemogram, Serum electrolytes - Sodium, Potassium, Calcium, and Magnesium, Blood glucose levels, Renal function tests, Chest X-Ray, ECG, 2D ECHO, Serum fasting lipid profile, BUN, serum uric acid, Liver function tests, and complete urine analysis. Results: The most common sign on examination was pulmonary rales in 34(68%). Next was S3 on auscultation in 31 patients (62%), B/L ankle edema was noticed in 29 patients (58%), raised JVP in 24 (48%), tachycardia HR >120 bpm was noticed in 16 (32%), tachypnea RR >30 was seen in 19 patients (38%). Diabetes was noticed in 9 patients, five of them had and two were having previous h/o of IHD. Broad QRS complexes >120 msec was noticed in 12 patients (24%) had complete LBBB with very broad QRS complexes >140 msec. Calcium was within the normal limits in 54% patients. Hyperkalemia was noticed in 6 patients (12%). Hyperuricemia was observed in 31 patients (62%) (17 males, 14 females) 30 of 32 males were having the cardiothoracic ratio >0.55. 17 of 18 female patients were having increased CTR. Massive cardiomegaly >0.66 is noticed in 6 patients. Conclusion: Chronic heart failure is a frequent complex clinical syndrome, symptoms of HF are relatively non-specific making the clinical diagnosis still difficult. Efforts must be made for the diagnosis of Chronic Heart Failure early, diabetes and strict management of the comorbidities, the compliance of the patients are of importance in prognosis. The physician's knowledge, skill, and judgment are key factors in the treatment and overall outcome.

**Keywords:** Heart Failure, Clinical Study, Tertiary care Hospital.

### INTRODUCTION

Many definitions of heart failure have been put forward over the last 50 years [1], these highlight one or several features of this complex syndrome such as hemodynamics, oxygen consumption, or exercise capacity. HF is a complex clinical syndrome cardiac disorder that impairs the ability of the ventricle to fill with or eject blood. The cardinal manifestations of HF are dyspnea and fatigue, which may limit exercise tolerance, and fluid retention, which may lead to pulmonary congestion and peripheral edema [2]. Heart failure is the only common cardiovascular disease increasing in prevalence and incidence. The overall

prevalence of heart failure is 3-20 per 1000 population, although this exceeds 100 per 1000 in those aged 65 years and over. The annual incidence of heart failure is 1-5 per 1000, and the relative incidence doubles for each decade of life after the age of 45 years. In the United States, more than 5 million people suffer from heart failure [3]. And global estimates of prevalence for those aged 65 yrs or older range from 30 to 130 per 1000 of this population [4]. According to Framingham heart study, the lifetime HF risk for men and women free of HF at age 40 was 21% for men and 20.3% for women [5]. In younger age groups HF is more common in men because the most common cause coronary heart disease

occurs in earlier decades. In elderly, the prevalence is equal between the sexes. Up to 3-6% of the general population may have asymptomatic left ventricular systolic dysfunction and be at high risk of developing symptomatic HF within 5 years [6]. Reliable estimates of heart failure are lacking in India because of the absence of a surveillance program to track the incidence, prevalence, outcomes and key causes of heart failure. The prevalence of heart failure in India due to coronary heart disease hypertension, obesity, diabetes and rheumatic heart disease to ranges from 1.3 to 4.6 million [7]. Although these risk factors are well recognised, HF does not develop in all patients so exposed. A "multiple hit" hypothesis has been promoted to account for these epidemiological observations in HF pathophysiology analogous to the multiple hit hypothesis advanced in cancer pathophysiology [8]. Of particular importance in clinical research at present are the single or multiple gene defects that may precipitate HF directly [9] or enhance the predisposition to HF given a specific environmental exposure [10]. HF in the elderly is frequently underdiagnosed, as cardinal symptoms of exercise intolerance are often attributed to ageing, co-existing comorbidities, and poor health status. common comorbidities are renal failure, diabetes, stroke, and COPD. We in the present study tried to study the various clinical manifestations of Chronic Heart Failure and to identify the major etiological and risk factors of Chronic Heart Failure in

the patients attending the Cardiology unit of this Tertiary Care Hospital.

## MATERIAL AND METHODS

This study was conducted in the Department of General Medicine and Cardiology, Prathima Institute of Medical Sciences, Naganoor, Karimnagar. Institutional Ethical committee Permission was obtained for the study. A written consent was obtained from all the participants of the study. A total of 50 patients with symptoms of heart failure were included in the study. Of the total 50 patients, n=32 were male and n=18 were female patients. All patients selected were subjected to detailed history, clinical examination and investigations. Inclusion criteria: Patients with symptoms of heart failure for more than 3 months. Exclusion criteria: Acute Heart Failure due to any cause was excluded, Cor Pulmonale, HF secondary to thyroid disorders. Complete Hemogram, Serum electrolytes - sodium, potassium, calcium, and magnesium Blood glucose levels, Renal function tests, Chest X-Ray, ECG, 2D ECHO, Serum fasting lipid profile, BUN, serum uric acid, Liver function tests, and complete urine analysis.

## RESULTS

In Fifty cases of heart failure age and sex wise distribution, etiological, risk factors evaluation, different lab parameters were analyzed.

**Table-1: Age & Sex wise distribution of cases**

Age	Male	Female	Total
20-40	0	3(16.6%)	3
41 - 60	18 (56.25%)	10 (55.5%)	28
61-80	12 (37.5%)	5(27.77%)	17
81-100	2 (6.25%)	0	2
Total	32	18	50

The age group ranged from 35 years to 85 years. Most common age group of patients on presentation are among 41yrs- 60yrs with 18 male

patients (56.2%) and 10 female patients(55.5%) In fifty patients Male were 32(64%), Female were 18 (36%) Male: Female ratio was 1.77: 1.

**Table-2: Symptoms of Heart Failure**

Symptoms	Male (%)	Female (%)
Orthopnea	16 (50%)	7(38.88%)
PND	23(71.87%)	11(61.11%)
Fatigue	32 (100%)	18(100%)
Edema	18 (56.25%)	10(55.55%)
Nocturnal cough	7 (21.87%)	2(11.11%)
palpitations	14 (43.75%)	5 (27.7%)
Syncope	6 (18.75%)	2(11.11%)

Most common symptom was fatigue in 32 male patients (100%) and 18 female patients (100%) followed by paroxysmal nocturnal dyspnoea seen in 23 male patients (71%) and in 11 female patients (61%) Most common NYHA Class of dyspnea was Class III in

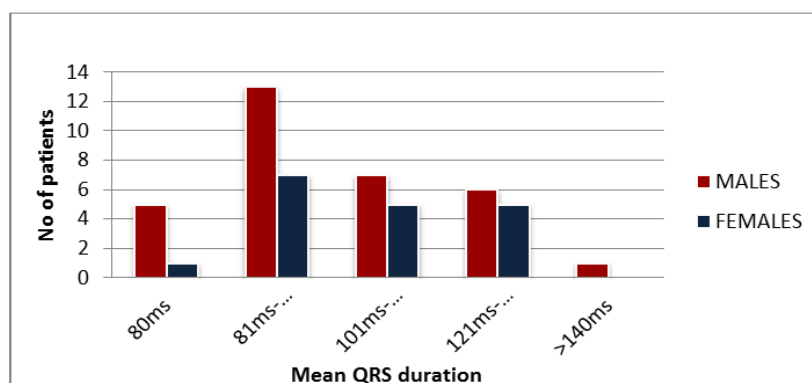
30 patients (60%) Class II in 10 (20%) and Class IV in 10 (20%). The least common clinical feature was syncope shown by 6 male patients (18%) and 2 female patients (11.1%).

**Table-3: Major Signs of Heart Failure**

Sign	Male	Female	Total	Percentage
Tachycardia	10	6	16	32%
Raised JVP	14	10	24	48%
Positive HJR	7	3	10	20%
Pulmonary rales	20	14	34	68%
Tachypnea	11	8	19	38%
S <sub>3</sub>	21	10	31	62%
Hepatomegaly	12	9	21	42%
Ankle edema	19	10	29	58%
Ascites	4	2	06	12%
Pleural effusion	10	5	15	30%

Most common sign on examination was pulmonary rales in 34(68%). Next most common was S<sub>3</sub> on auscultation in 31 patients (62%), B/L ankle edema was noticed in 29 patients (58%), raised JVP in 24 (48%), tachycardia HR >120 bpm was noticed in 16 (32%), tachypnea RR >30 was seen in 19 patients (38%). The most common minor sign was cardiomegaly on examination in 33 patients (66%) followed by MR murmur in 19 (38%) and hypotension was noticed in 2 patients. AF was present in 4 patients and it was the exacerbating feature of heart failure in them. The common risk factor was smoking in 38 patients (76%), alcohol intake in 29 patients (58%). Hypertension as a risk factor was present in 26 patients (52%). Patients with age group >65 years were 18 (36%) (10 Males, 3 females) Patients who were overweight constituted 30% of the present study (13 male, 2 female) Obesity seen in

12 (24%) (9 females, 3 males) IHD as a risk factor was present in 13 patients (26%). Diabetes as a risk factor was noticed in 9 patients, five of them had concomitant hypertension and two were having previous h/o of IHD. Diabetes as a sole risk factor is present in only two patients Male gender as a risk factor of HF (64%). H/O Smoking is seen in 28 males (87.5%) and in 10 females (55.55%). In this study 22 patients were normotensive (44%) 11 patients (22%) were having stage I hypertension 140-159/90-99 mm hg BP. 8 patients (16%) were having stage II hypertension >160/100 mm Hg, 6 patients were previously known hypertensive and were non-complaint, thus precipitating heart failure in them. 6 (12%) were hypotensive, two of them were previously hypertensive and were on diuretics and ACEI.

**Graph-1: mean QRS duration in ECG**

Broad QRS complexes > 120 msec was noticed in 12 patients (24%) one patient had complete LBBB with very broad QRS complexes > 140 msec. Most of the patients were having a normal QRS duration (40%). LVH by ECG criteria was present in 31(62%) patients overall, in male patients (68.7%) 9 females (50%). Dilated LA indicating increased left

atrial overload and pressure in the left heart was noticed in 30 patients by echocardiography. All patients with the left atrial size of 5- 6 cm were having Atrial Fibrillation clinically with LA clot in two of them. Preserved EF i.e 45 -50% was seen in 7 patients. Severe LVD EF < 30% was noticed in 33 patients overall (66%).

**Table-4: Regional Wall Motion Abnormality**

Regional Wall Motion Abnormality	Males	Females	Total
Global Hypokinesia	23 (71.8%)	14(77.77%)	37
Akinetic Wall	4(25%)	2(11.11%)	6
No RWMA	5(15.6%)	2(11.11%)	7

**Table -5: Serum Potassium, Calcium and Magnesium Levels**

Serum Electrolyte mg/dl	< normal	Within normal	> normal
Serum Sodium	13 (26%)	16 (32%)	21 (42%)
S.Calcium	27 (54%)	23(46%)	0
S .Magnesium	1(2%)	48(96%)	1(2%)
S Potassium	5(10%)	39(78%)	6(12%)

Calcium was within the normal limits in 54% patients. Hyperkalemia was noticed in 6 patients (12%). All the six patients were on Spironolactone. Hyperuricemia was observed in 31 patients (62%) (17 males, 14 females) 30 of 32 males were having a cardiothoracic ratio >0.55 17 of 18 female patients were having increased CTR. Massive cardiomegaly >0.66 is noticed in 6 patients. Patient with >0.70 CTR had the apex impulse in the 7<sup>th</sup> intercostal space. Ischaemic heart disease (previous MI) in 13 patients (26%), hypertension and diabetes in 22 patients (44%), valvular heart disease in 8 (16%). Other in 07 (14%) alcoholic cardiomyopathy in 4 patients idiopathic dilated cardiomyopathy in 3 patients. During the study period, four patients expired and three are of refractory heart failure and one patient of alcoholic cardiomyopathy.

## DISCUSSION

Chronic heart failure is a complex clinical syndrome, which is common and the only cardiovascular disease with an increasing prevalence. HF has no territorial boundaries, unlike the coronary artery disease. The modern clinical approach to the diagnosis of heart failure contrasts with the methods used in many early epidemiological studies. Diagnosis of CHF requires the simultaneous presence of at least 2 major criteria or 1 major criterion in conjunction with 2 minor criteria [11]. Minor criteria are acceptable only if they cannot be attributed to other medical conditions (such as Pulmonary Hypertension, Chronic Lung Disease, Cirrhosis, Ascites or Nephrotic Syndrome). The Framingham heart study criteria are 100 % sensitive and 78% specific for identifying patients with definite congestive heart failure. This study of chronic heart failure in 50 patients has been carried out in order to evaluate the clinical presentation, different etiological factors and to determine the various Lab, ECG, 2D ECHO parameters of the patients. There was male predominance with M:F 1.77 : 1 in this study as reported by other similar studies in Europe and the United States [12]. In our study the most common age of presentation was 40-60 yrs, with the mean age group being  $59.04 \pm 0.94$  years. The youngest patient was of 35 years, the oldest being 85 years. As HF is a disease that increases in prevalence with increased age, most of the patients were in the age group 40-60 years. Among the study of etiological factors in the present study, it was found that 44% of patients had hypertension and IHD Ischaemic heart disease (previous MI) in 13 patients (26%) and diabetes in 22 patients (44%). Hypertension is associated with an increased risk of heart failure, although the relative risk is lower than for

myocardial infarction. However, because the prevalence of hypertension is much higher than myocardial infarction, the proportion of cases of heart failure in the population that might be attributed to hypertension is higher [13]. The presence of hypertension in most of the patients in this study is probably due to the more prevalence of hypertension in the population. The coronary heart disease may be clinically asymptomatic in these patients, secondary to hypertension. Diabetes mellitus is associated with an increased risk of heart failure, particularly in women and after myocardial infarction. Diabetes can induce structural and functional changes in the myocardium that increases the risk of HF [14]. Part of this risk due to DM2 can be attributed to concomitant hypertension, obesity, and dyslipidemia. Out of 9 patients with diabetes in the present study, 5 were having concomitant hypertension, one patient had diabetes and CAD, one patient had both HTN and CAD along with Type 2 DM a single female patient had diabetes of 7 years duration and was morbidly obese. Diabetes as a sole risk factor was noticed in two males. LVH by ECG criteria is present in 31 patients (62%) with heart failure thereby indicating itself as a risk factor for HF as published in Eur Heart Journal, 1999. Cowie MR *et al.*, [12] Smoking (76%) and alcohol intake (58%) as the risk factor was noticed concomitantly in most of the patients with other risk factors, but not as a single risk factor. Overweight and obesity as a risk factor noticed concomitantly along with other factors in 54% patient. A family H/O of HF was noted in eleven of our patients, this indicates the probable genetic determinant of the disease. Most common major sign of HF was pulmonary rales seen in 34 (68%) patients. Pulmonary rales have a specificity of 99% for HF, as described by Harlan *et al.*, [15] S3, the ventricular gallop sound, indicative of systolic dysfunction, was noted in 62% of patients in the present study. Right heart failure signs noted were edema followed by raised JVP and congestive hepatomegaly. Tachycardia (HR >120 bpm significant for HF) was present in 14% patients. QRS Duration >120msec was seen in 12 patients (24%) with one patient having a broad QRS complex >140 msec indicating a complete LBBB. The patient had a low EF. LVH by ECG criteria was seen in 31 patients (62%). Atrial fibrillation was seen in 4 patients. Global hypokinesia was the common finding seen on 2D Echo, followed by regional wall motion abnormality indicating previous IHD. EF<30% was present in patients who were having symptoms of long duration, major symptoms of HF and presence of more than two risk factors. These patients needed to be followed up regularly and they are the one to be

benefited by cardiac resynchronization therapy as recommended by ACC/AHA guidelines, 2009. EF>40 indicating preserved systolic function is present in 7 patients, these patients were of older age and hypertensive. Deaths occurred in 4 patients, 3 were of refractory heart failure and one was of Alcoholic Cardiomyopathy.

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