



## Clinical and Etiological Profile of Heart Failure

### KEYWORDS

Heart failure ,hypertension, rheumatic heart disease,diabetes.

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### ABSTRACT

*Heart failure is a common cardiovascular condition with increasing incidence and prevalence. It is known to be caused by various risk factors. There is a contrast in the scenario with regards to the risk factors and the age of presentation between the western population and the Indian population. In India it affects a relatively younger age group due to some specific causes found less frequently in the western population. Rheumatic heart disease still is a common cause of heart failure in Indians. Around 30-40%of the patients die from heart failure within 1 year after receiving the diagnosis. heart failure is disabling and severely reduces the quality of patients life. The present study evaluates the etiological factors of the heartfailure in patients admitted to government general hospital Kurnool,over a period of 1 year.*

### Introduction:

The worldwide prevalence and incidence rates of heart failure (HF) are approaching epidemic proportions, as evidenced by the relentless increase in the number of HF hospitalizations, the growing number of HF-attributable deaths, and the spiraling costs associated with the care of HF patients. The epidemiology in India has changed from that reported by the vakil in 1949 describing hypertension-coronary and rheumatic, syphilis and pulmonary causes as the primary factors for the heart failure. Owing the successes in the communicable diseases, the population of India is ageing and with ageing population the burden of heart failure also rises.

Besides this, in India, the risk factors like obesity, hypertension, diabetes, coronary artery disease, are on a rise owing to rapid urbanization and influence of western culture. More recent evaluations have provided limited insight into the broader HF landscape in India, since these have focused on the specific etiologies of HF and HF outcomes in selected patients at the level of tertiary care centers, rather than community based surveillance. Unlike the previous trends of etiology there has been a shift in the leading causes of heart failure in India

### Study

In this study prospective analysis of 50 cases of heart failure admitted into the wards of Government General Hospital, Kurnool the study evaluated the causes of heart failure in the various age groups, the clinical presentation of the heart failure, the pattern of distribution of heart failure in both sexes and socioeconomic strata the present study is based on the clinical, etiological profile of Heart Failure in patients above 15 years age, who are admitted in Government General Hospital, Kurnool during the period. All the classical cases of Heart Failure according to Framingham Criteria with right sided or left sided independently or in combination (bi-ventricular failure) were included

Patients below age of 15 years & already diagnosed cases of congenital heart diseases were excluded from this study. Diagnosis of heart failure was confirmed by "Framingham Criteria" and in some cases with 2-D echocardiography. Clinical presentation and etiology of the patients of heart failure was analysed.

### Out of 50 cases of heart failure the common causative factors are:

Coronary artery disease	14 (28%)
Hypertension	10 (20%)
Rheumatic heart disease	8 (16%)
Corpulmonale	6 (12%)
Anemia	4 (8%)
Cardiomyopathy	3 (6%)
Miscellaneous	5 (10%)

**Sex Ratio:** Male (29) to Female (21)1.38 : 1

**Age Distribution:** The incidence of heart failure is common in the age groups 46-65 years which amounts about 42% (21/50).

**Socio Economic Distribution:** Heart failure is common 40/50 (80%) in low socio economic individual as compared to high socio economic groups 10/50 (20%) but in contrary, coronary artery disease causing heart failure in more commonly seen in high socio economic groups

**Commonest presentation (according to Framingham Study):** Paroxysmal nocturnal dyspnea 38 (6%), Orthopnea 24 (48%), Gallop rhythm 22 (44%), Hepatomegaly 13 (26%) Acute pulmonary oedema 43 (86%), Increased JVP 40 (80%) Ankle oedema 38 (6%)Pleural effusion 30 (60%) ,Tachycardia 41 (82%)

### The distribution of the cases as per the etiology

**RISK FACTORS ASSOCIATED WITH CAD IN PRESENT STUDY**Hypertension is most common risk factor 64% risk factor, followed by smoking 57%, diabetes mellitus 50%

followed by obesity 35%, family history of CAD 21%. Echocardiography was done in 14 patients, 11 patients had regional wall motion abnormality. The presence of RWMA by 2DE had an 83% sensitivity, a 57% specificity, and a 77% predictive accuracy in detecting CAD in patients with DCM and thus in distinguishing ischemic from idiopathic DCM

In the present study, Cor pulmonale as a cause of HF, was seen in 12% as the 4<sup>th</sup> cause with a male predominance (M:F=2:1), due to smoking and environmental exposure. 2DEchocardiography is a bedside tool found to be effective in diagnostic and prognostic evaluation of the patients on treatment. 90% of hypertensive patients with heart failure were found to have left ventricular hypertrophy. In this study moderately severe anemia was a contributory factor to heart failure which occurred at severely hemoglobin levels of less than 7gm/dl in contrast to other studies (Tanner ET al<sup>7</sup>, 15% at Hb <12gm/dl). Rheumatic heart disease showed a preponderant involvement of mitral valve as a dominant cause of heart failure in this study. Scorpion sting associated heart failure were seen in 4% of the cases in this study. The burden of the heart failure was seen in patients from the low socioeconomic social group (80%) in the present study, owing to the fact that the patient load to the hospital is predominantly formed by the poor strata.

### Discussion

HF is a complex clinical syndrome that results from any structural or functional impairment of ventricular filling or ejection of blood<sup>1</sup> "Defined as the pathophysiological state in which an abnormality of Cardiac function is responsible for the failure of heart, to pump blood at a rate commensurate with the requirements of the metabolizing tissues and or to be able to do so only from an elevated filling pressure<sup>2</sup>.

In physiological terms heart failure may be defined as circumstances in which heart does not deliver the Oxygen to the tissues at a rate to maintain their Oxygen requirement or demand. Most cases of Heart failure are due to coronary artery disease or long standing Hypertension, Coronary artery disease was found in 46% of the Heart failures in men and 27% in women with vast majority of these patients it is associated with Hypertension. Blood pressure of 160/95 mm. Hg or more is noted in more than 75% of Heart failure caused by Hypertension.

Rheumatic Heart disease is now an uncommon cause of Heart failure in adults. It was a major cause of serious valvular Heart disease and myocarditis leading to heart failure. Rheumatic Fever and Rheumatic Heart disease also an important Cardiovascular problem in tropical and subtropical parts of the world. Cardiomyopathy accounted for only 2% in men and 6% in women. The occurrence of alcoholic cardiomyopathy appears appears to be 8% and it is 2.5 times more frequent in blacks than whites.

Long standing COPD viz., Bronchitis, Bronchial, Asthma, Emphysema and Rheumatic heart disease once considered as the leading cause of cardiac failure have become the next in order to Coronary Artery Disease. Diabetes Mellitus predisposes to cardiac failure because of the accelerated Atherosclerosis and Hypertension. Moreover it appears to damage the myocardium. Impaired Glucose tolerance increases risk 2 to 7 fold, with greater impact in women than men directly, especially in the age group of 65 or more.

**CLINICAL FEATURES: DYSPNOEA:** Commonest symptoms of heart failure, initially occurs only on unaccustomed exertion

or with exercise with worsening the level of activity resulting in dyspnoea may even be present at rest. With increasing left ventricular failure the pressure in left atrium pulmonary veins and capillaries rises. The raised hydrostatic pressure results in a shift of fluid from the vascular to extra compartment making the lungs stiff and non compliant with consequent increased work of breathing and development of dyspnoea.

**ORTHOPNEA:** It develops due to severe left sided failure. It refers to difficulty in breathing in supine position and results from increased venous return with increased pulmonary venous congestion, reduced vital capacity because high position of diaphragm, which may be further displaced upwards by ascites or an enlarged liver.

**PAROXYSMAL NOCTURNAL DYSPNOEA:** This manifests as episodes of dyspnoea of sudden onset occurring in middle of the night. Patients gets up suddenly feeling excessively breathless and chokes and longs for fresh air. Shortness of breath is associated with cough with pink and frothy sputum.

**MECHANISM OF PAROXYSMAL NOCTURNAL DYSPNOEA** Absorption of oedema fluid with increase in right ventricular output over filling the lungs. Diminished sympathetic drive of sleep decreasing left ventricular contractility. Nocturnal arrhythmias.

**FATIGUE:** It is relative low cardiac output compromising perfusion of skeletal muscles. Exercise capacity is reduced by the limited ability of the failing heart to increase its output and deliver oxygen to the exercising muscle. Anorexia, nausea associated with abdominal pain and fullness are frequent complaints which may be due to congested stomach, liver and portal venous system<sup>3</sup>.

**OLIGURIA / NOCURIA:** During the day there is reduced renal perfusion and increased retention of sodium and water with oliguria. At night renal perfusion increase because of a shift of fluid from the extra vascular to the intra vascular compartment thereby resulting in renal excretion of sodium and water and nocturia.

**PHYSICAL SIGNS:** In moderate heart failure patient appears to be in no distress at rest except that he or she may be uncomfortable when lying flat for more than few minutes. In more severe heart failure patient is dyspnic orthopnic with increased heart rate and diminished pulse pressure reflecting reduction in stroke volume. Hands and feet may be cold, there may be peripheral cyanosis and central cyanosis (Cor pulmonale). In acute heart failure hypotension may be prominent systemic venous pressure is often abnormally elevated in heart failure and may be recognized by observing the extent of jugular veins. Cardiac enlargement is usually present pulsation of the hypertrophied right ventricle may be appreciated at the lower left parasternal region and the epigastrium. S<sub>1</sub> may be variable P<sub>2</sub> is accentuated, S<sub>3</sub> and S<sub>4</sub> may be audible. Right ventricular dilatation may lead to tricuspid regurgitation manifesting as a pansystolic murmur at lower left sternal border increasing on inspiration. Patient with valvular lesion have auscultable cardiac murmurs depending on the valvular involvement.

**PULMONARY RALES:** Inspiratory crepitant rales and dullness to percussion over the lung bases are common with heart failure and elevated pulmonary venous and capillary pressures. In case of pulmonary oedema, rales may be heard widely over both lung fields. They are fre-

quently coarse and sibilant and accompanied by expiratory wheeze. Some patients with longstanding heart failure have no rales because of increased lymphatic drainage of alveolar fluid.

**CARDIAC OEDEMA:** It is usually dependent occur symmetrically in legs particularly region and ankle in ambulatory patients in whom it is most prominent in the evenings, edema of arms and face occur rarely and then only late in course of Heart Failure.

**HYDROTHORAX AND ASCITES:** Plural effusion in Heart Failure results from elevation of pulmonary capillary pressure and transudation of fluid into plural cavity. It is more frequently seen in right than left.

Ascites occur as consequence of transudation and results from increased pressure in hepatic veins and the veins draining the peritoneum. Marked ascites occur in patient with tricuspid valve disease and constrictive pericarditis.

**CONGESTIVE HEPATOMEGALY:** An enlarged tender pulsating liver is observed in severe conditions with ascites and also milder forms of Heart Failure of any cause. Hepatomegaly as in patients with tricuspid valve disease or chronic constrictive pericarditis enlargement of spleen i.e., congestive splenomegaly also may occur .

#### COMPARISON OF PRESENT STUDY WITH OTHER STUDIES

S.NO	CAUSE	FRAMINGHAM HEART STUDY <sup>4</sup>	HILLINGDON STUDY <sup>5</sup>	BROMLEY HF STUDY <sup>6</sup>	PRESENT STUDY
1.	ISCHEMIC	59%(M), 48%(F)	36%	52%	28%
2.	HYPERTENSIVE	70% 78%	14%	4%	20%
3.	VALVULAR	22% 31%	7%	10%	16%
4.	ALCOHOL			4%	2%
5.	OTHERS	7% 7%	4	5	10%

This pattern of etiology of heart failure in the present study is on par with that of the previous studies and included few rare causes that were pertinent to the Indian subcontinent which were least or not reported in the western literature.

#### Conclusion:

Heart failure is a ever growing problem of the human race at the cost of improved living and prolonged age besides the lifestyle patterns with various causes leading to this morbid cardiovascular disease and which when not addressed timely can be fatal. Recognition of the causative factors for this can be a useful tool in focusing the resources both manual and technical in the preventive aspects of the disease. This study has thrown some light on the pattern and the etiology to provide a insight into the same.

**JAUNDICE:** It is late finding associated with elevation of both direct and indirect reacting bilirubin. It is due to impairment of hepatic function secondary to hepatic congestion and the hepatocellular hypoxia.

**CARDIAC CACHEXIA :**In sever Heart Failure there may be serious weight loss and cachexia because of elevation of circulating concentration of TNF, elevation of metabolic rate, anorexia, nausea, vomiting due to central causes, impairment of intestinal absorptions due to congestio

**TREATMENT:** Treatment of Heart Failure may be divided into 3 components. Removal of precipitating causes, Correction of the underlying cause, Control of the congestive Heart Failure (Reduction of cardiac workload, Control of excessive retention of sodium and water )

The present study evaluated the etiological profile of patients and in comparison with the other landmark studies the findings are as follows

The various landmark studies that studied the etiological basis of the heart failure are the Framingham heart study, the Hillingdon heartfailure study, Bromley heart failure study.

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