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A **Study Conducted At A Tertiary Care Teaching Institute in Chennai, on The Clinical And Etiological Profile Of Patients With Acute Heart Failure.**

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I. Introduction

AHF is defined as rapid or gradual onset of signs and symptoms of heart failure that results in urgent unplanned hospitalizations/ office/ Emergency Department visits[1].Heart Failure is one of the most important causes of morbidity and mortality in the industrialized world. During the last decade, there has been growing interest in the field of research with the publication of first randomized, placebo-controlled AHF trials in 2002.[2]

II. Aim of the Study

1. To study the Clinical profile of patients suffering with Acute Heart Failure.
2. To study the etiological factors causing Acute Heart Failure
3. To study the risk and precipitating factors of Acute Heart Failure
4. To study the outcome of patients with Acute Heart Failure

III. Review of Literature

Similar studies on Acute Heart Failure have been done earlier by other authors. In EHFS-II[3] CAD constituted 53.6 percent; DCMP 19.3 percent; Valvular 34.4 percent; Hypertension 62.5 percent among the aetiologies for AHF. In EHFS-II[3] .Decompensated HF constituted 65 percent, Pulmonary Oedema 16 percent, Hypertensive heart failure 11 percent, .In EFICA[5] study group Pulmonary Oedema constituted 82 percent and Cardiogenic shock 29 percent In EHFS-II[3],the mean LVEF was 38%. In ALARM-HF[4], the mean LVEF was 40%, in EFICA[5] the mean LVEF was 35%. The mean ejection fraction in OPTIMIZE-HF[6] study group was 39%.In EHFS-II[3] study group Median length of stay was 9 days. Taking into account only the patients discharged alive, LOS increased in the Cardiogenic Shock group to 13 days and 9 days for Decompensated HFIn all the studies Cardiogenic Shock was single major cause for mortality of around 40%. The figures in different studies are as follows. Mortality was 6.7 percent in EHFS-II [3], 12 percent in ALARM-HF[4] and 29 percent in EFICA[5] study groups. In ADHERE study group the in hospital mortality rate was 4.0 percent.

IV. Methodology

4.1 Place of Study: Dept of General Medicine and Dept of Cardiology, Meenakshi Medical College and Hospital, Kanchipuram

1. Study Sample: 50 patients who met the inclusion criteria were selected randomly for the study.
2. Study Type: Prospective, Observational study
3. Study Period: October 2012 – September 2014

4.2 Inclusion Criteria

1. Age: More than 20 years
2. Sex: Both Genders
3. Acute shortness of breath related to acute failure of either right ventricle or left ventricle are included in the study. History and clinical examination of patients with Acute Heart Failure are done on the basis of Framingham's Heart Failure criteria.

4.3This study recruited patients admitted to hospital (Emergency department; General Medicine and Cardiology department) with dyspnea and verification of Heart Failure (new-onset Heart Failure vs ADCHF) based on:

1. Symptoms (Dyspnea) and Signs (rales, hypotension, hypoperfusion,right ventricular heart failure) of heart failure.
2. Lung congestion on X-ray Chest

Clinical history, symptoms and signs and medication (admission as well as discharge) were included. The pre hospital medical history including previous HF, Coronary Artery Disease, Hypertension, Renal failure, Diabetes and precipitating factors such as Arrhythmias; ACS; and Valvular disorders were also included.
The medical management of HF before and during the hospitalization was registered. The most recent echocardiography data were collected.

4.3 Exclusion Criteria

Other causes of acute shortness of breath like Acute COPD exacerbation, Pneumothorax, Acute Bronchial asthma, Pleural effusion, Metabolic Acidosis, Non-Cardiogenic causes of pulmonary edema like sepsis, Acute Pancreatitis, Cirrhosis, Chronic Kidney disease etc were not included in the study.

4.4 Statistical Analysis:

The data was presented as absolute numbers, percentages, means and medians. The statistical computation were performed by using IBM-SPSS(Statistical Package for Social Sciences) software 21 version were used for data entry and analysis.For age and Ejection Fraction (EF) means and standard deviations are given. A significance level of <0.05 was assumed and all p-values are the results of two-tailed tests.

V. Observations And Results

Table 1

characteristics	adchf/DENOVOahf		tOTAL
	denovo ahf	adchf	
number of sample	16	34	50
mean age	41.75	57.44	52.42
precipitating factors / risk factors			
anaemia	2	7	9
alocohol abuse	0	2	2
acute coronary syndrome	4	8	12
arrythmias(af/svt/vt)	6	5	11
copd	1	1	2
diet discretion(fluids/salt)	2	2	4
infections	0	5	5
non compliance(drugs)	1	10	11
coronary artery disease	0	5	5
hypertension	7	22	29
diabetes mellitus	7	23	30
cva/tia	0	6	6
valvular disease	7	9	16

Table-2: Age Distribution

	AGE WISE DISTRIBUTION IN BOTH SEXES		
AGE GROUP(Yrs)	FEMALE	MALE	TOTAL
20-30	4	2	6
31-40	2	3	5
41-50	3	8	11
51-60	3	8	11
61-70	3	11	14
71-80	1	2	3
TOTAL	16	34	50

The mean age was 52.4Yrs; range 20-80 Yrs.The commonest age group involved are 50-70 Yrs; No patients were less than 20 Yrs; only 3 patients were >80 Yrs, Mean age of patients with Denovo AHF is 41.75 Yrs and ADCHF is 57.44 Yrs.

Table-3 Sex Distribution

Sex	**Frequency**	**Percent**
Female	16	32%
Male	34	68%
Total	50	100%

Male preponderance was seen in the study.Males constituted about 68% and Females 32%. Sex ratio Male : Female =3:1

Table-4 Body Mass Index

		BMI CLASSIFICATION		Total
		18.5 - 24.9	25-29.9	
DENOVO AHF	Count	10	6	16
	%	27.00%	46.20%	32.00%
ADCHF	Count	27	7	34
	%	73.00%	53.80%	68.00%
Total	Count	37	13	50
	%	100.00%	100.00%	100.00%

All the patients in our study group are in between BMI of 18.5- 29.9. None of them are above >30.0; more number of patients are with BMI of 18.5-24.9 and with ADCHF.

Table-5 Risk Factors

Risk Factors	Number	**%**
Hypertension	29	58%
Diabetes Mellitus	30	60%
Coronary Artery Disease	5	10%
Cva	6	12%
Family H/O	18	36%
Smoking	27	54%
Alcohol	20	40%

Coronary Artery Disease, Hypertension, Diabetes were frequent underlying diseases often co-existent

Table-6 Etiology

Etiology	No.	%
Cad-Stemi	18	36%
Valvular	10	20%
Acclerated Htn	7	14%
Cad-Nstemi	5	10%
Dcmp	6	12%
Myocarditis	3	6%
Pah	1	2%

Acute Coronary Syndrome was the major cause in patients with denovo AHF, present in approximately 45% cases in which ACS was due to STEMI

Arrhythmias were equally prevalent as precipitating factor in AHF patients; regardless of previous history of heart failure. Valvular disorders, infections and non- compliance to medication were common in ADCH

Chart-1 Risk Factors For Acute Heart Failure

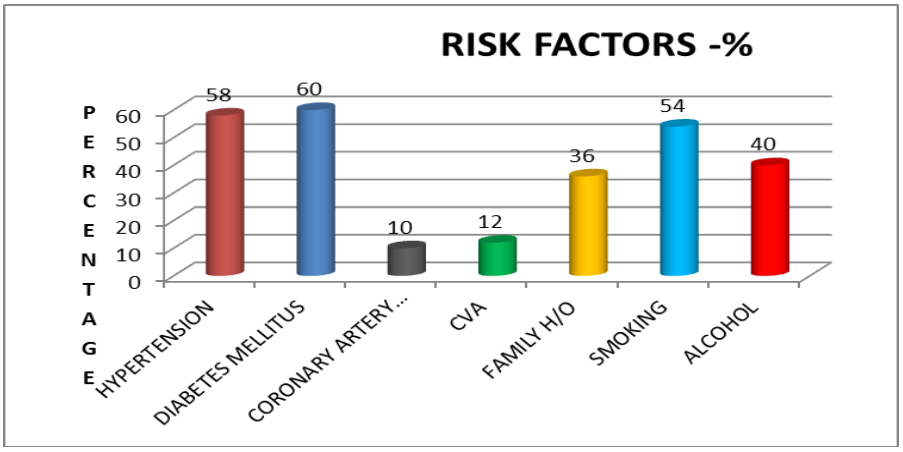


Chart-2 Etiological Factors For Acute Heart Failure

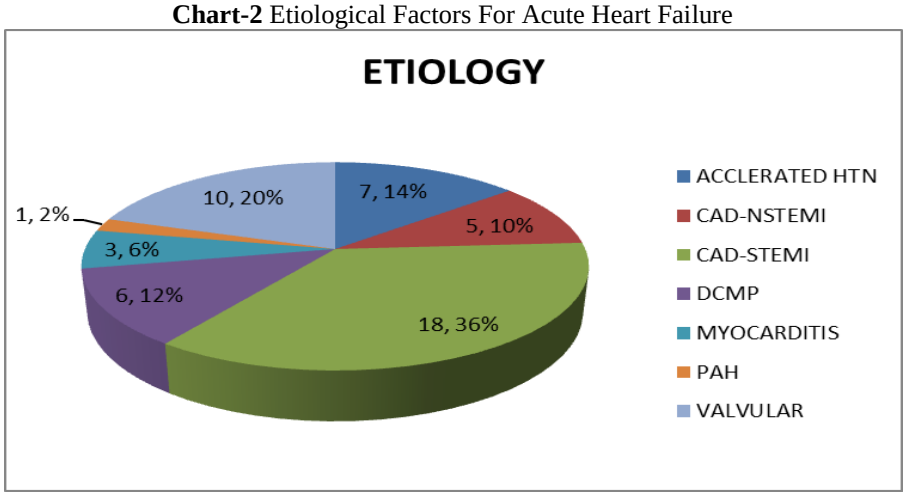


Table-7 Clinical Scenario

Clinical Scenario	Frequency	Percent
Cardiogenic Shock	7	14%
Pulmonaryedema	14	28%
Decompensated Hf	25	50%
Hypertensive Hf(With Preserved Lvsystolic Function)	3	6%
Right Hf	1	2%
Total	50	100%

Decompensated Heart Failure was the most common clinical presentation accounting for 50% of cases Pulmonary Oedema and Cardiogenic Shock were present in 28percent and 14 percent patients respectively. Hypertensive Heart Failure with preserved LV systolic function was seen in 6percentpatients andRight Heart Failure in 2 percent patients (CHART-5)In Decompensated HF , over two third had a history of Heart Failure (ADCHF)Non compliance to medication was also assessed to cause decompensation of heart failure in about 23 percent patients in this groupPulmonary Oedema and Cardiogenic Shock were precipitated by an acute coronary event,often with Myocardial Infarction(MI). STEMI was the cause of ACS in 43% of with Cardiogenic Shock

Almost all patients presenting with Hypertensive Heart Failure had a previous history of Hypertension In the Right Heart Failure, Pulmonary Artery Hypertension and COPD were prevalent as both precipitating factors and underlying conditions.

Chart-3 Clinical Presentations Of Acute Heart Failure

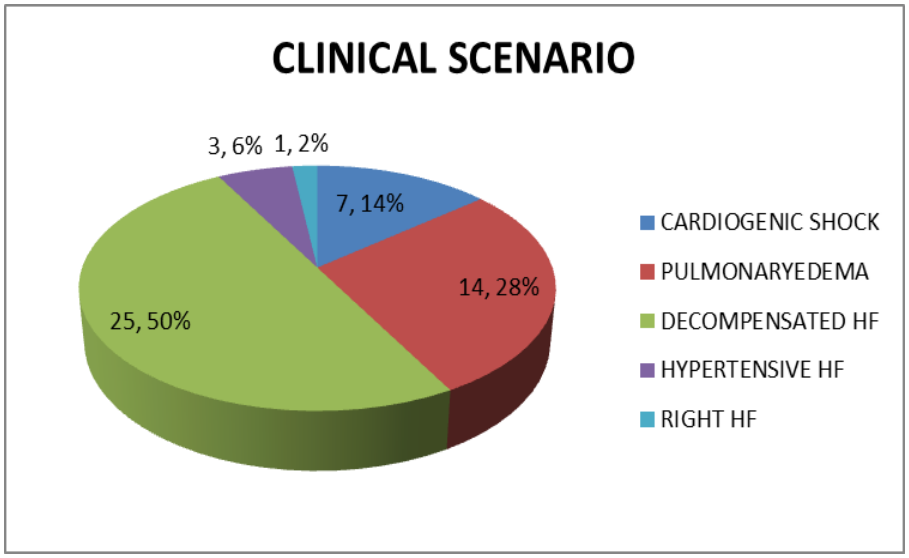


Chart-4 Valuvlar Disorders Causing Acute Heart Failure

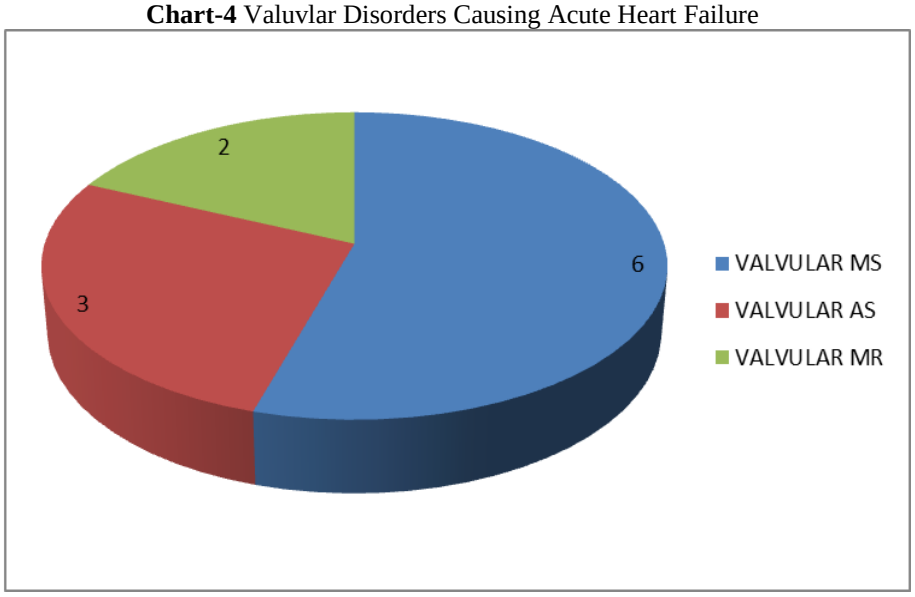


Table-8 Echocardiographic Findings

Group Statistics					
		Number	Mean	Std. Deviation	Std. Error Mean
Ef%	Adchf	34	44.47	6.819	1.169
	Denovoahf	16	48.44	3.741	.935

The mean EF for ADCHF and denovo HF were compared, using t-test (t value-2.171, df-48, p=0.035), shows significant difference in mean EF; The EF for denovo AHF is significantly higher than that of ADCHF Overall mean LVEF was 45 percent, but denovo AHF patients had slightly higher mean LVEF(48 percent) compared to ADCHF patients.Depressed LV function (LVEF <40 percent) was more common in the ADCHF group.Preserved LV function (LVEF >45 percent) was present in nearly 46% percent patients

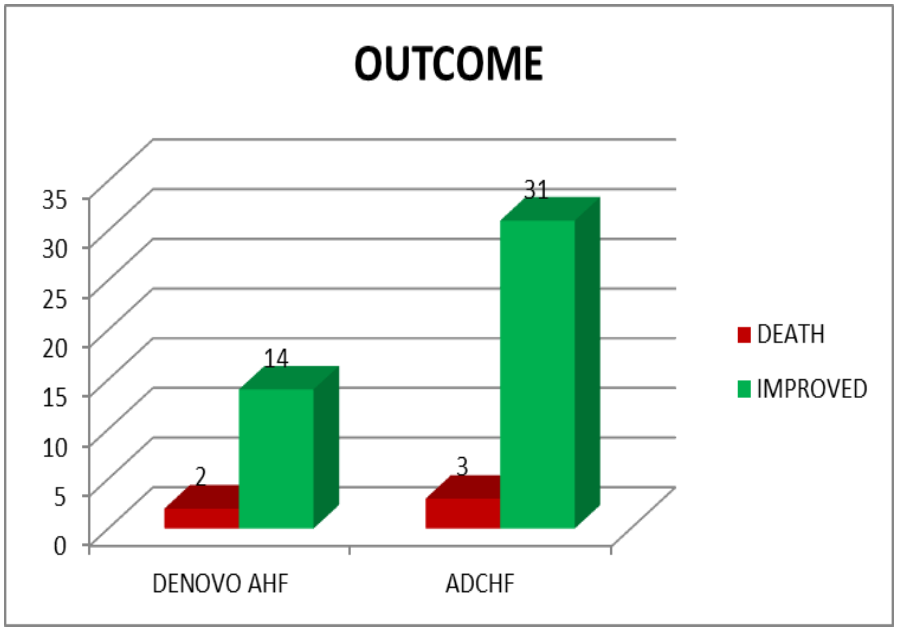
Valvular disorders were common.Mitral Stenosis was more frequent.MS was followed in prevalence by Mitral Regurgitation and Aortic Stenosis (CHART-6)Patients were managed conservatively with diuretics, inotropes, digoxin, Beta-blockers, Angiotensin converting enzyme inhibitors or Angiotensin receptor blockers,vasodilators, Antiarrhythmics, Anti platelets, statins, ventilatory support.Diuretics, vasodilators, and inotropes were widely used according to merit of the patient.Patients with pulmonary oedema or persistent hypoxia required ventilator support

Table-9 Length Of Stay/ In-Hospital Mortality

Outcome * ADCHF/Denovoahf					
			ADCHF/denovoAHF		TOTAL
	OUT COME		DENOVO AHF	ADCHF	
	DEATH	No.of patients	2	3	5
		%	12.5%	8.8%	10.0%
	IMPROVED	No.of patients	14	31	45
		%	87.5%	91.2%	90.0%
	TOTAL	No.of patients	16	34	50
		%	100.0%	100.0%	100.0%

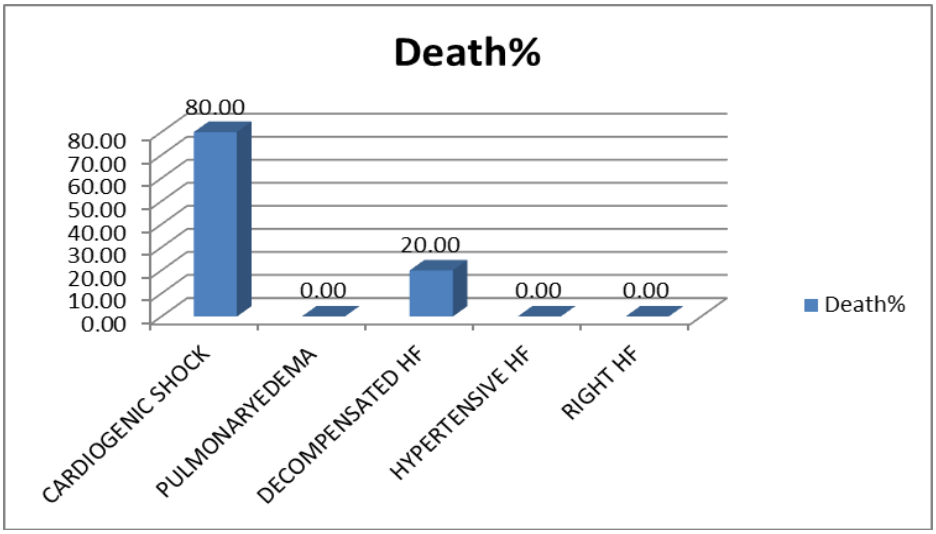
Median Length of stay in hospital in all patients was 6 days. Nearly two-third of patients were treated in ICU or CCU, and their median stay in ICU/CCU was 2 days. Pulmonary Oedema and Hypertensive Heart Failure patients needed ICU/CCU treatment in a higher proportion compared with other clinical classes.

Chart-5



The in-hospital mortality rate in the study was 10 percent. Among them patients with Cardiogenic Shock dominated the mortality rate of about 80%. In Pulmonary Oedema and Decompensated HF, prognosis was also worse.The best survival was seen in Hypertensive HF, as almost all patients were discharged alive

Chart-6



VI. Limitations of the study

The present study has some limitations. As this study was a single hospital-based study conducted on different clinical and risk factor profile, these results cannot be applied to the general population.

VII. Conclusion

1. Fifty patients of Heart Failure were studied clinically in which male preponderance was found with a mean age of 52.4 years
2. Coronary Heart Disease, Hypertension, Diabetes Mellitus, Anaemia, Arrhythmias are common risk factors
3. The clinical syndrome of AHF may present as denovo AHF or as decompensated CHF. Acute Heart Failure has to be considered both in patients with denovo presentation and previous decompensation states irrespective of preserved Left Ventricular Ejection Fraction, and prompt identification of precipitating factors and management of the same results in a better outcome
4. Decompensated Heart Failure was the most common clinical presentation in the study
5. Coronary Artery Disease is the most common aetiology of AHF particularly in elderly population.Acute Coronary Syndrome was the major precipitating factor in patients with denovo AHF.
6. A patient with AHF requires immediate diagnostic evaluation and care, and frequent resuscitative measures to improve symptoms and survival.
7. Adherence to treatment guidelines and the use of HF medication have improved the morbidity and prevented the mortality
8. Mortality for patients presenting with cardiogenic shock was highest.Low systolic blood pressures at hospital admission identifies patients with poorer prognosis

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