The Bioscan
AN INTERNATIONAL QUARTERLY JOURNAL OF LIFE SCIENCES
20(4): 877-882,2025
www.thebioscan.com

Clinical Characteristics of Admitted Heart Failure Patients with Preserved Mid-Range and Reduced Ejection Fraction

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DOI: 10.63001/tbs.2025.v20.i04.pp877-882

KEYWORDS:
Heart failure patients, Acute de novo, HF with preserved ejection fraction, mid-range ejection fraction and reduced EF

Received on:
22-09-2025

Accepted on:
12-11-2025

Published on:
04-12-2025

ABSTRACT

Background: Heart failure (HF) presents a serious burden in India, with estimated prevalence ranging from 1.3 to 4.6 per million populations. Heart failure risk factors are diverse and probably vary by geographical region. It is essential for reducing mortality, preventing rehospitalization, and enhancing quality of life to optimize treatment early on with guideline-directed medical therapies (GDMTs) in patients with HF. The aim of this research is to determine the factors that lead to hospitalization and to identify risk factors associated with each subtype of HF. The research evaluates the clinical traits of hospitalized heart failure (HF) patients categorized into those with preserved ejection fraction (HFpEF; EF ≥50%), mid-range ejection fraction (HFmrEF; EF 41%–49%), and reduced ejection fraction (HFrEF; EF <40%).

Materials and Methods: Cross-sectional prospective study conducted in a Tertiary Care Centre at Puducherry (18 months), enrolling 240 heart failure patients via convenient sampling. Data collected included demographics, medical history, physical exam, chest X-ray, ECG, CBC, renal function, blood sugar, and lipid profile. Comorbidities assessed were hypertension, diabetes, CAD, CVA, chronic renal failure (creatinine ≥2.0 mg/dL or dialysis), anemia (Hb <13 g/dL in men, <12 g/dL in women), and atrial fibrillation. All patients underwent 2-D echocardiography with LVEF measured by Simpson's method. Heart failure was classified as HFrEF (<40%), HFmrEF (41–49%), or heart rate with preserved ejection fraction (HFpEF) (≥50%). Risk factors, hospitalization triggers, and in-hospital outcomes were documented.

Results: In the present study, heart failure patients classified by ejection fraction found HFrEF most common (61.25%), followed by HFmrEF (18.75%) and HFpEF (20%). Mean age was 61.6 years with predominance of males particularly in HFmrEF, whereas HFpEF cases had more females. Acute de novo cases were more frequent. Diabetes (78.8%), hypertension (72.9%), and CAD (67.9%) were major comorbidities, with CAD most prevalent in HFrEF and HFmrEF. Breathlessness (78.3%) and edema (58.8%) were the leading symptoms. Anemia affected 78.3%, mostly in HFrEF. The ECG revealed a sinus rhythm (63.3%), atrial fibrillation (AF) at 21.7%, and left ventricular hypertrophy (LVH) at 25.8%. Cardiomegaly (49.6%) and signs of pulmonary congestion were shown on chest X-rays. The average EF was 38%, and RWMA and valvular issues were prevalent. Drug and dietary non-compliance were major causes. GDMT adherence was moderate, withACEi/ARB/ARNI used in 64.2%, beta-blockers in 56%, and SGLT2 inhibitors highest in HFrEF.

Conclusion: This heart failure registry provides clinical characterization of admitted heart failure patients classified by heart failure subtypes. There were significant differences among each heart failure subgroups when compared to other Indian cohorts. Our study gives an opportunity to improve the care for heart failure patients and increase awareness of modifiable risk factors and precipitating factors for hospital admission.

INTRODUCTION

Heart failure (HF) is a clinical syndrome in which patients have typical symptoms and signs resulting from an abnormality of cardiac structure, function, or both.[1] The prevalence of heart failure (HF), a global pandemic that affects over 64.3 million people worldwide, is particularly concerning in India. Heart failure (HF) is categorized by left ventricular ejection fraction (EF). Based on the 2016 European Society of Cardiology (ESC) guidelines on HF, and extensive subsequent research, there are three distinct entities: HF with EF that is reduced (HFrEF; <40%), mid-range or mildly reduced (HFmrEF; 40%–49%) or preserved (HFpEF; ≥50%).[2] A distinct distribution of comorbidities, demographic traits, and possibly a different prognosis and outcome can be used to characterize the specificity of patients with each of these HF subtypes.[3]

The prevalence of HF in the elderly population has increased due to improved survival following myocardial infarction and increased prevalence of co-morbidities including hypertension, diabetes, metabolic syndrome, valvular heart disease, and coronary artery disease. Chronic heart failure (HF) is a global health concern with a poor prognosis that leads to millions of hospitalizations worldwide, despite significant advancements in treatment.[4-6] Heart failure (HF) remains a major cause of death, disease, and hospitalizations worldwide, despite the fact that landmark studies have the potential to greatly influence evidence-based clinical practice.[7] Hence, this study aims to identify the precipitating factors for hospitalization and identify risk factors related to each HF subtype. The study assess the clinical characteristics of hospitalized patients with HF divided into HF with

preserved ejection fraction (HFpEF; EF ≥50%), mid-range EF (HFmrEF; EF 41%–49%), and reduced EF (HFrEF; EF <40%).

AIM AND OBJECTIVES

- To describe the clinical characteristics of hospitalized patients with HF divided into HF with preserved ejection fraction (HFpEF; EF ≥50%), mid-range EF (HFmrEF; EF 41%–49%), and reduced EF (HFrEF; EF <40%).
- To identify precipitating factors for hospitalization and
- To identify risk factors related to each HF subtype.

MATERIALS AND METHODS

This is a cross sectional prospective study conducted in a Tertiary Care Centre at Puducherry (No: 21/SVMCH/IEC-cert/Oct22) for a period of 18 months with a study population of 240 (Convenient Sampling) heart failure patients. All patients admitted with Heart failure who fulfills the Framingham criteria and are aged >18 years are included in the study. Patients with a history of heart transplantation, implantation and pacemaker devices, congenital heart disease, and septicaemia-related heart failure are excluded from the study.

Methodology: Demographic data, medical history, physical examination, chest X-ray, ECG, complete blood count, renal function, blood sugar, and lipid profile were assessed. Past history of hypertension, diabetes mellitus, coronary artery disease, cerebrovascular disease, chronic renal failure (serum creatinine ≥2.0 mg/dL or dialysis/transplant), anemia (Hb < 13 g/dL in men, < 12 g/dL in women), and atrial fibrillation was recorded. After the initial evaluation, all patients underwent 2-D echocardiography, and left ventricular ejection fraction (LVEF) was measured by the Simpson method to classify heart failure as:

- HFrEF: LVEF < 40%
- HFmrEF: LVEF 41–49%
- HFpEF: LVEF ≥ 50%

Risk factors, precipitating causes for hospitalization, and in-hospital clinical outcomes were documented.

Data Collection Methods: Data will be collected using a predesigned proforma, including patient demographics, precipitating factors, comorbidities, laboratory parameters, chest X-ray, ECG, 2D echocardiography findings, in-hospital outcomes, and treatment details.

STATISTICAL ANALYSIS

Data will be entered in excel and analysed using SPSS software version 29.0. Categorical variables will be reported as frequency and percentages and continuous variables as mean and standard deviation. Means for continuous variable will be compared using Chi-square test. P value of <0.05 is considered significant.

RESULTS

Heart failure categories differed statistically considerably in terms of age and sex distribution ($p<0.01$); HFmrEF had a male predominance, HFpEF had a female predominance, and mean age varied significantly between groups ($p=0.002$). While the distributions of CKD and COPD were non-significant ($p>0.05$), those of CAD ($p<0.004$), atrial fibrillation ($p<0.001$), and thyroid illness ($p<0.05$) varied significantly among HF groups. Chest discomfort, edema, palpitations, and syncope did not significantly differ between HF groups ($p>0.05$), while smoking, alcohol use, and dyspnea did ($p<0.01$, $p<0.005$, and $p<0.005$, respectively). (Table 1)

Acute de novo presentations were significantly more common than acute decompensated cases in all HF groups ($p<0.05$), although there was no significant difference in the distribution of hypertension among HF types ($p>0.05$), and diabetes and hypertension were very common comorbidities. Heart rate ($p<0.05$), systolic blood pressure ($p<0.005$), high JVP ($p<0.001$), and NYHA class III–IV distribution ($p<0.009$) were all significantly different between HF groups, whereas diastolic blood pressure, respiration rate, and temperature did not differ significantly ($p>0.05$). (Table 2)

Platelet count, urea, RBS, and NT-proBNP levels did not differ significantly ($p>0.05$), whereas hemoglobin ($p<0.001$) and creatinine ($p<0.001$) levels differ significantly. Sodium, potassium, and lipid profile parameters did not significantly differ across groups ($p>0.05$), whereas anaemia was significantly associated with HF phenotype ($p<0.001$) and gender ($p<0.05$), being more common in HFrEF and among males. Among the HF groups, there were significant differences in creatinine ($p<0.05$), sodium ($p<0.005$), and potassium ($p<0.05$) levels; patients with HFrEF were more likely to have higher creatinine, hyponatremia, and electrolyte abnormalities. HDL levels varied considerably ($p<0.05$), with poor HDL more common in HFrEF and borderline HDL predominate in HFmrEF and HFpEF, total cholesterol and triglyceride levels did not significantly differ among HF groups ($p>0.05$). (Table 3)

Atrial fibrillation and sinus rhythm did not differ significantly ($p>0.05$), ECG abnormalities such as LBBB/RBBB ($p<0.01$), LVH ($p<0.001$), broad QRS/ST-T alterations ($p<0.001$), extended QTc ($p<0.01$), and poor R-wave progression ($p<0.001$) varied significantly among HF groups. Echocardiographic parameters such as ejection fraction, LA diameter, and LVEDD ($p<0.001$), as well as chest X-ray findings such as cardiomegaly ($p<0.001$), blunt costophrenic angles ($p<0.004$), pulmonary venous congestion ($p<0.002$), Kerley B lines ($p<0.002$), and alveolar edema ($p<0.001$). Drug non-compliance ($p<0.05$) and dietary non-compliance ($p<0.05$) were major precipitating factors for hospitalization, particularly in HFrEF, while RWMA ($p<0.01$), LVH ($p<0.01$), TR ($p<0.01$), and MR distribution varied considerably among HF groups. GDMT adherence patterns varied by HF phenotype, with Class I–IV drug use ranging among groups. Acute coronary syndrome, infections, and other precipitating causes also showed substantial variance among HF hospitalizations ($p<0.05$), as did the use of inotropes and diuretics ($p<0.05$). (Table 4)

DISCUSSION

In the present study, distribution of heart failure types among the study population was as follows: HFrEF at 61.25%, HFmrEF at 18.75% and HFpEF at 20.0%. Similarly, in a study by Shukkoor et al., among the south Indian population, distribution of HFrEF (65.9%), HFmrEF (20%), and HFpEF (14.03%) in a.[8] The study conducted by Onteddu et al., on a North Indian population revealed the following distribution: HFrEF at 77%, HFmrEF at 12%, and HFpEF at 11%.[9]

The average age of the study population was 61.59 ± 11.78 years, comprising 58.3% males and 41.7% females. In the HFrEF group, there was no gender predominance; however, the HFmrEF group exhibited male predominance peaking in the fifth decade, while the HFpEF group showed female predominance peaking in the sixth decade.

Shukkoor et al., reported a mean age of 59.9 ± 13.3 years, comprising 65.9% males and 34.1% females, demonstrating male dominance in HFrEF and HFmrEF and female

dominance in HFpEF.[8] Onteddu et al. noted a mean age of 61 ± 14 years, and Chioncel et al. observed a similar female predominance in HFpEF within a European population.[9,5]

Our study found that 66.3% of patients had an acute de novo presentation, while 33.8% were acute decompensated. Among HFpEF patients, the acute de novo presentation rate was 73.3%. In a similar vein, Shukkoor et al. discovered that 67% were acute de novo and 32.9% were acute decompensated, with 93.6% of HFpEF patients being classified as acute de novo.[8]

In the present study, the top three comorbidities were Type 2 DM (78.8%), hypertension (72.9%), and CAD (67.9%). CAD was common in HFrEF and HFmrEF, Type 2 DM and hypertension were prevalent across all phenotypes. Chioncel et al. reported ischemic etiology in HFrEF and Type 2 DM, hypertension, and AF were common in HFpEF.[5] Harikrishnan et al. found ischemic heart disease (72%), dilated cardiomyopathy (13%), and rheumatic heart disease (8%).[10]

In the current study, breathlessness and edema were prevalent across all heart failure groups, whereas chest pain was observed only in HFmrEF and HFpEF. According to Shukkoor et al., breathlessness is the most common symptom in HFrEF and HFpEF, while tiredness and weight gain are presenting symptoms in HFmrEF.[8]

NYHA class III-IV was observed in 43.3% of admissions in the present study. In the earlier research by Harikrishnan et al. noted a figure of 32.87% for NYHA class IV, whereas Chioncel et al. found it to be 26% for NYHA class III/IV.[10,5] Smoking and alcohol consumption were observed in 27.9% and 32.5% in the present study population respectively, compared to 16% for tobacco use and 19% for alcohol in Harikrishnan et al.[10]

The mean heart rate was 86 ± 20 beats per minute, the average SBP was 123.61 ± 22.65 mmHg, and the average respiratory rate was 21 ± 5 breaths per minute. In the study by Shukkoor et al. reported an average SBP of 119 ± 25 mmHg, while Chioncel et al. reported SBP as 124.3 ± 20.8 mmHg and HR as 72.9 ± 15.4 beats/min.[8,5] Gok et al. observed that HFrEF patients had lower SBP.[11]

In the present study, the mean Hb was 10.80 ± 1.92 g/dL, with 78.3% of patients being anaemic, equally distributed across all HF groups. Shukkoor et al. reported anaemia in 41.6% (55.5% HFmrEF, 52.3% HFpEF, 35.13% HFrEF), while Onteddu et al. found 54% prevalence.[8,9]

Creatinine <1.2 mg/dL and >1.2 mg/dL were seen in 46.3% and 53.8% of patients, with high creatinine most common in HFmrEF (68.9%). Shukkoor et al. reported 19.8% of males and 10.2% of females with high creatinine.[8] Harikrishnan et al. reported a mean creatinine of 1.4 ± 0.9 mg/dL.[10]

The mean sodium was 132.38 ± 8.02 mEq/L, with hyponatremia in 42.9% and hypernatremia in 1.7%, hyponatremia being more prevalent in HFrEF ($p<0.005$). Similarly in 2.2% hyponatremia was reported by the earlier study Shukkoor et al.[8]

The mean potassium was 3.93 ± 0.87 mEq/L, with hypokalemia in 36.7% and hyperkalemia in 12.5%; 57.8% of HFmrEF patients were hypokalemic. According to the previous study by Shukkoor et al. the incidence of hypokalemia was 20.4% and hyperkalemia 7.5%, with hypokalemia more common in HFrEF.[8]

The mean total cholesterol was 242 ± 63 mg/dL (HFrEF 246 ± 63, HFmrEF 236 ± 64, HFpEF 237 ± 63). In the earlier study by Gok et al., reported lower values (HFrEF 157 ± 51, HFmrEF 155 ± 63, HFpEF 149 ± 39 mg/dL).[11]

On ECG, sinus rhythm was seen in 63.3% of the population (72.9% in HFpEF), 40.4% had poor R-wave progression, LVH was predominant in HFpEF (45.8%), and AF was present in 21.7% overall (31.3% in HFpEF). Chioncel et al. reported 62.4% sinus rhythm equally across HF types, with AF 32.2% and LVH 48.2% in HFpEF.[5] Shukkoor et al. found 80.6% sinus rhythm and 10.4% of HFrEF had LBBB.[8]

The mean ejection fraction was 38(±11) % on entire study population. The mean EF of HFrEF; HFmrEF and HFpEF were 31(±6)%; 44(±3)%, and 54(±2)% repectively($p<0.001$). In the study by Shukkoor et al., the mean ejection fraction was 37.8(±10.6). The mean EF of HFrEF; HFmrEF and HFpEF were 32.02(±5.9)%; 43.3(±2.9)%, and 57.7(±5.3)%.[8] In the study by Chioncel et al., mean EF% of HFrEF-29.1±7.6; HFmrEF-44.0±5.3; HFpEF- 59.7±7.7.[5]

In the present mitral regurgitation was seen in 58.3% of the study population, predominant on HFrEF-HFmrEF, whereas in the study by Chioncel et al., MR seen in 31.2% of the population and more predominant in HFrEF group (35.6%).[5] Drug non-compliance and dietary non-compliance were most common precipitating factors for heart failure admissions. The study by Shukkoor et al., shows 93% of total admissions due to poor dietary compliance and 42.3% of them were poor drug compliance.[8] Inotropes were used in half of the population with equal distribution among all three HF phenotypes. About two thirds of the study population exhibited the use of GDMT for all heart failure patients. In the HFmrEF and HFrEF groups, there was a higher prevalence of Class 1 and Class 3 drug use. As per Shukkoor et al., Class 3-MRA was utilized in 80% of the HFrEF group, followed by ACEi/ARB/ARNI and Beta-blocker.[8] In the study by Shiga et al., beta blockers were most commonly used among HFrEF groups.[12] According to research conducted by Rywik et al., more than 90% of HFrEF participants received ACEIs, BBs, and diuretics, while the administration of MRAs approached 85%.[13]

REFERENCES

1. James SL, Abate D, Abate KH, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 354 Diseases and Injuries for 195 countries and territories, 1990 2017: a systematic analysis for the Global Burden of Disease Study 2017. The Lancet. 2018;392:17891858.
2. Ponikowski P, Voors AA, Anker SD, Bueno H, Cleland JG, Coats AJ, et al. 2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). Developed with the special contribution of the Heart Failure Association (HFA) of the ESC. Eur Heart J. 2016;37(27):2129–200.
3. Chioncel O, Lainscak M, Seferovic PM, et al. Epidemiology and one-year outcomes in patients with chronic heart failure and preserved, mid-range and reduced ejection fraction: an analysis of the ESC Heart Failure Long-Term Registry. Eur J Heart Fail. 2017; 19: 1574-1585.
4. Levy D, Larson MG, Vasan RS, Kannel WB, Ho KK. The progression from hypertension to congestive heart failure. JAMA 1996; 275(20): 1557-62.
5. Rich MW. Epidemiology, pathophysiology, and etiology of congestive heart failure in older adults. J Am Geriatr Soc 1997; 45(8): 968-74.

6. Deedwania PC. The progression from hypertension to heart failure. Am J Hypertens 1997; 10.
7. Tomasoni D, Adamo M, Lombardi CM, Metra M. Highlights in heart failure. ESC Heart Failure [Internet]. 2019 Dec 1;6(6):1105–27.
8. Shukkoor, A.A., George, N.E., Radhakrishnan, S. et al. Clinical characteristics and outcomes of patients admitted with acute heart failure: insights from a single-center heart failure registry in South India. Egypt Heart J **73**, 38 (2021).
9. Onteddu SH, Wangchuk G, Sharma AJ, Mohan JC. Acute decompensated heart failure in a North Indian community hospital: Demographics, clinical characteristics, comorbidities and adherence to therapy. Indian Heart Journal. 2020 Jan;72(1):27
10. Harikrishnan S, Sanjay G, Anees T, Viswanathan S, Vijayaraghavan G, Bahuleyan CG, et al. Clinical presentation, management, in-hospital and 90-day outcomes of heart failure patients in Trivandrum, Kerala, India: the Trivandrum Heart Failure Registry: Trivandrum heart failure registry. Eur J Heart Fail. 2015 Aug;17(8):794–800
11. Gok G, Kılıç S, Sinan ÜY, Turkoglu E, Kemal H, Zoghi M. Epidemiology and clinical characteristics of hospitalized elderly patients for heart failure with reduced, mid-range and preserved ejection fraction. Heart & Lung. 2020 Sep;49(5):495–500.
12. Shiga T, Suzuki A, Haruta S, Mori F, Ota Y, Yagi M, et al. Clinical characteristicsof hospitalized heart failure patients with preserved, mid range, and reduced ejection fractions in JAPAN. ESC Heart Failure. 2019 Jun;6(3):475–86.
13. Rywik TM, Doryńska A, Wiśniewska A, Cegłowska U, Drohomirecka A, Topór-Mądry R, et al. Epidemiology and clinical characteristics of hospitalized patientswith heart failure with reduced, mildly reduced, and preserved ejection fraction. Pol Arch Intern Med. 2022 May 30;132(5):16227.

TABLES:

Table 1. Distribution of the Heart Failure Based on Age & Sex

VARIABLE	ALL (n = 240)	HFrEF (n = 147)	HFmrEF (n = 45)	HFpEF (n = 48)	P-Value
Age, mean ± SD	61.59 ± 11.78	59.70 ± 12.79	64.76 ± 11.14	64.40 ± 7.27	0.002
Male n (%)	140 (58.3%)	84 (57.1%)	31 (68.9%)	25 (52.1%)	< 0.01
Female n (%)	100 (41.7%)	63 (42.9%)	14 (31.1%)	23 (47.9%)	< 0.01
Diabetes	189 (78.8%)	119 (81%)	37 (82.2%)	33 (68.8%)	0.164
Hypertension	175 (72.9%)	113 (76.9%)	30 (66.7%)	32 (66.7%)	0.223
CAD	163 (67.9%)	107 (72.8%)	33 (73.3%)	23 (47.9%)	0.004
CKD	31 (12.9%)	24 (16.3%)	4 (8.9%)	3 (6.3%)	0.131
COPD	6 (2.5%)	5 (3.4%)	1 (2.2%)	0 (0.0%)	0.420
Atrial Fibrillation	52 (21.7%)	42 (28.6%)	8 (17.8%)	2 (4.2%)	0.001
Thyroid Disease	21 (8.8%)	19 (13%)	0 (0.0%)	2 (4.2%)	0.012
Smoker	67 (27.9%)	51 (34.7%)	10 (22.2%)	6 (12.5%)	0.008
Alcohol	78 (32.5%)	58 (39.5%)	13 (28.9%)	7 (14.6%)	0.005

Table 2. Distribution Based on Heart Failure, Symptoms, NYHA Class, and Vital Signs

VARIABLE	ALL	HFrEF	HFmrEF	HFpEF	P-Value
Distribution of presentations of heart failure					
Acute de novo	159 (66.3%)	93 (63.3%)	33 (68.8%)	33 (73.3%)	0.421
Acute decompensated	81 (33.8%)	54 (36.7%)	12 (26.7%)	15 (31.3%)	0.421
Presenting symptoms among phenotypes					
Breathlessness	188 (78.3%)	125 (85%)	32 (71.1%)	31 (64.4%)	0.005
Chest Pain	37 (15.4%)	17 (11.6%)	10 (22.2%)	10 (20.8%)	0.114
Palpitations	12 (5%)	3 (2%)	3 (6.7%)	6 (12.5%)	0.103
Edema	141 (58.8%)	94 (63.9%)	24 (53.3%)	23 (47.9%)	0.105
Syncope	11 (4.6%)	9 (6.1%)	1 (2.1%)	1 (2.2%)	0.358
NYHA Class					
NYHA I–II	73 (30.4%)	46 (31.3%)	14 (31.1%)	13 (27.1%)	0.854
NYHA III–IV	104 (43.3%)	75 (51.0%)	13 (28.9%)	16 (33.3%)	0.009
Vital Signs					
HR (bpm)	86 ± 20	86 ± 18	87 ± 18	84 ± 26	0.015
SBP (mmHg)	123.61 ± 22.65	123.61 ± 23.80	124.78 ± 18.06	127.79 ± 23.03	0.005
DBP (mmHg)	77.69 ± 13.19	77.86 ± 14.18	76.98 ± 11.56	77.85 ± 11.64	0.469
RR (bpm)	21 ± 5	21 ± 5	22 ± 5	20 ± 5	0.466
Temp (°F)	98.62 ± 0.92	98.62 ± 0.90	98.41 ± 1.01	98.82 ± 0.87	0.336
Elevated JVP n (%)	150 (62.5%)	105 (71.4%)	20 (44.4%)	25 (52.1%)	0.001

Table 3. Distribution of Lab Parameters, Anaemia, Creatinine, and HDL Abnormalities

VARIABLE	ALL	HFrEF	HFmrEF	HFpEF	P-Value
HB (g/dl)	10.80 ± 1.92	10.55 ± 1.90	10.56 ± 2.22	11.80 ± 1.32	< 0.001
PLT (lakhs/mm³)	2.22 ± 1.56	2.05 ± 0.52	2.45 ± 0.40	2.75 ± 0.80	0.503
Urea (mg/dl)	41.1 ± 24.9	41.3 ± 23.9	50 ± 30.8	32.2 ± 18.1	< 0.001
Creatinine (mg/dl)	1.55 ± 1.13	1.60 ± 1.26	1.80 ± 1.13	1.60 ± 2.23	< 0.001

RBS (mg/dl)	195 ± 110	252 ± 180	165 ± 210	142 ± 155	0.315
NT Pro BNP (pg/dl)	4635 ± 6525	6954 ± 4732	3954 ± 2982	3344 ± 2545	0.115
Sodium (mg/dl)	132.38 ± 8.02	131.12 ± 8.64	132.98 ± 7.90	135.67 ± 4.54	0.130
Potassium (mg/dl)	3.93 ± 0.87	4.00 ± 0.89	3.74 ± 0.79	3.90 ± 0.88	0.455
Total Cholesterol (mg/dl)	242 ± 63	246 ± 63	236 ± 64	237 ± 63	0.547
TGL (mg/dl)	168 ± 62	169 ± 68	173 ± 47	161 ± 56	0.457
HDL (mg/dl)	44 ± 9	42 ± 9	46 ± 8	45 ± 9	0.343
LDL (mg/dl)	128 ± 38	130 ± 39	126 ± 42	124 ± 34	0.466
VLDL (mg/dl)	33 ± 17	34 ± 17	30 ± 16	35 ± 18	0.413
Anaemic (Hb < 12 g/dl)	188 (78.3%)	126 (85.7%)	32 (71.1%)	30 (62.5%)	0.001
Non-Anaemic (Hb > 12 g/dl)	52 (21.7%)	21 (14.3%)	13 (28.9%)	18 (37.5%)	0.001
Creatinine < 1.2 mg/dl	111 (46.3%)	67 (45.6%)	14 (31.1%)	30 (62.5%)	0.010
Creatinine > 1.2 mg/dl	129 (53.8%)	80 (54.4%)	31 (68.9%)	18 (37.5%)	0.010
HDL > 60 mg/dl	2 (0.8%)	1 (0.7%)	1 (2.2%)	0 (0%)	0.010
HDL 40–60 mg/dl	136 (56.7%)	71 (48.3%)	33 (73.3%)	32 (66.7%)	0.010
HDL < 40 mg/dl	102 (42.5%)	75 (51.0%)	11 (24.4%)	16 (33.3%)	0.010

Table 4. Distribution of ECG, Chest X-ray, and Echocardiography Parameters

VARIABLE	ALL	HFrEF	HFmrEF	HFpEF	P-Value
Sinus Rhythm	152 (63.3%)	91 (61.9%)	26 (57.8%)	35 (72.9%)	0.269
AF	52 (21.7%)	26 (17.7%)	11 (24.4%)	15 (31.3%)	0.134
LBBB	43 (17.9%)	31 (21.1%)	9 (20.9%)	3 (6.3%)	0.061
RBBB	17 (7.1%)	5 (3.4%)	4 (8.9%)	8 (16.7%)	0.007
LVH	62 (25.8%)	27 (18.4%)	13 (28.9%)	22 (45.8%)	< 0.001
Wide QRS	25 (10.4%)	16 (10.9%)	6 (11.1%)	4 (8.3%)	0.869
ST-T Changes	17 (7.1%)	1 (0.7%)	8 (17.8%)	8 (16.7%)	< 0.001
Prolonged QTC	13 (5.4%)	2 (1.4%)	4 (8.9%)	7 (14.6%)	0.004
Poor R Wave	97 (40.4%)	70 (47.6%)	19 (42.2%)	8 (16.7%)	< 0.001
Cardiomegaly	119 (49.6%)	87 (59.2%)	13 (28.9%)	19 (39.6%)	< 0.001
Upper Zone Vessel Enlargement	110 (45.8%)	80 (54.4%)	12 (26.7%)	18 (37.5%)	0.002
Kerley B Lines	118 (49.2%)	84 (57.1%)	14 (31.1%)	20 (41.7%)	0.005
Airspace Shadowing	97 (40.4%)	73 (49.7%)	10 (22.2%)	14 (29.2%)	< 0.001
Blunt Costophrenic Angle	125 (52.1%)	89 (60.5%)	16 (35.6%)	20 (41.7%)	0.004
LVEF % Mean (SD)	38 ± 11	31 ± 6	44 ± 3	54 ± 2	< 0.001
LA Size (mm)	41.65 ± 5.99	42.57 ± 5.90	40.10 ± 6.16	40.27 ± 5.62	0.049
LVEDD (mm)	62.35 ± 15.1	65.52 ± 8.93	58.23 ± 15.94	48.28 ± 9.01	< 0.001
RWMA n (%)	123 (51.2%)	86 (58.5%)	21 (46.7%)	16 (33.3%)	0.008
LVH n (%)	71 (29.6%)	29 (19.7%)	14 (31.1%)	28 (58.3%)	< 0.01
RVH n (%)	9 (3.8%)	3 (2.0%)	4 (8.9%)	2 (4.2%)	0.105
MR n (%)	140 (58.3%)	95 (64.6%)	27 (60.0%)	18 (37.5%)	0.004
TR n (%)	37 (15.4%)	18 (12.2%)	14 (31.1%)	5 (10.4%)	0.005
AS n (%)	5 (2.1%)	1 (0.7%)	0 (0%)	4 (8.3%)	0.003