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# Prognosis and Outcome for Elderly Patients with Acute Decompensated Heart Failure

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## Abstract

*Background:* Heart failure (HF) is a multifaceted cardiovascular condition manifested by a progressive pathophysiology and an evolving landscape of therapeutic interventions. The under representation of older adults in clinical trials results in limited certainty concerning the effectiveness and safety of evidence-based therapeutic interventions for HF, as findings are frequently derived from studies conducted in younger cohorts. Older adults with acute decompensated heart failure (ADHF) are at a higher risk of hospitalization and often exhibit more severe clinical presentations than younger patients.

*Aim of Study:* This study was conducted with the objective of describing the clinical trajectory of elderly patients admitted with ADHF and to assess their prognosis and outcomes both during hospitalization and at a six-month follow-up.

*Patients and Methods:* This study encompassed 149 hospitalized geriatric patients aged 60 years and above presenting to Alexandria Main University Hospital with clinical manifestations of ADHF throughout a six-month duration.

*Results:* The age range of the studied patients was between 60 and 88 years, with a mean ± standard deviation (SD) of 66.7±5.5 years. 120 patients (80.5%) had heart failure with reduced ejection fraction (HFrEF), 19 patients (12.7%) had heart failure with preserved ejection fraction (HFpEF), and 10 patients (6.7%) had heart failure with mildly reduced ejection fraction (HFmrEF). A significant improvement in ejection fraction (EF) was observed at both discharge and follow-up ($p<0.001$ for both time points). During follow-up, a significant decrease in the degree of dilatation of left ventricle was observed ($p<0.008$), though this did not correspond to reverse LV remodeling. The number of patients receiving optimal medical therapy significantly increased at discharge and at a six-month follow-up ($p=0.0009$ and $p=0.0007$, respectively).

*Conclusion:* The study indicated that elderly patients experienced an elevated prevalence of complications throughout the hospitalization period with many requiring readmission within six months after discharge. HF-related mortality is high among elderly patients, and their responses to pharmacological therapy are variable, necessitating close monitoring. The suboptimal utilization of guideline-directed medical therapy, coupled with the complexities of managing multiple comorbidities, contributes to poorer long-term outcomes.

***Key Words:*** *Elderly patients – Acute decompensated heart failure.*

## Introduction

**THE** morbidity and prevalence of heart failure (HF) progressively increase with advancing age and continue to escalate over time due to population aging and advancements in therapeutic interventions that have improved survival rates **[1]**. Readmission rates among elderly patients within 3 to 6 months following discharge remain high, ranging from 27% to 47%. Approximately 50% of readmissions are attributed to comorbidities, polypharmacy, and disabilities associated with CHF **[2]**. More than 80% of heart failure (HF) patients are aged 65 years and above; **[3]** however, physician recognition of cognitive impairment in this population has remained relatively limited **[4]**.

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***Abbreviations and Acronyms:***

ACE : Angiotensin-converting enzyme.
ACEi : Angiotensin-converting enzyme inhibitors.
ADHF : Acute decompensated heart failure.
AF : Atrial fibrillation.
AKI : Acute kidney injury.
ALT : Alanine aminotransferase.
ARB : Angiotensin receptor blocker.
ARNI : Angiotensin receptor-neprilysin inhibitor.
AST : Aspartate aminotransferase.
BBB : Bundle branch block.
BPM : Beats per minute.
BP : Blood pressure.
BNP : B-type natriuretic peptide.

| | |
|---|---|
| CBC | : Complete blood count. |
| CAD | : Coronary artery disease. |
| CHF | : Chronic heart failure. |
| CKD | : Chronic kidney disease. |
| COPD | : Chronic obstructive pulmonary disease. |
| CRP | : C-reactive protein. |
| CVS | : Cerebrovascular diseases. |
| DCM | : Dilated cardiomyopathy. |
| DM | : Diabetes mellitus. |
| DM | : Diabetes mellitus. |
| EDD | : End-diastolic dimension. |
| EDV | : End-diastolic volume. |
| EF | : Ejection fraction. |
| ECG | : Electrocardiogram. |
| ESD | : End-systolic dimension. |
| ESV | : End-systolic volume. |
| GDT | : Guideline-directed medical therapy. |
| HFrEF | : Heart failure with reduced ejection fraction. |
| HF | : Heart failure. |
| HFmrEF | : Heart failure with mildly reduced ejection fraction. |
| HFpEF | : Heart failure with preserved ejection fraction. |
| HbA1c | : Glycosylated Hemoglobin. |
| HDL | : High-density lipoprotein. |
| HR | : Heart rate. |
| HTN | : Hypertension. |
| KCCQ | : Kansas City Cardiomyopathy Questionnaire. |
| LA | : Left atrium/atrial. |
| LAVI | : Left atrial volume index. |
| LBBB | : Left bundle branch block. |
| LDL | : Low-density lipoprotein. |
| LV | : Left ventricular. |
| LVEF | : Left ventricular ejection fraction. |
| LVIDd | : Left ventricular internal dimension at end-diastole. |
| LVIDs | : Left ventricular internal dimension at end-systole. |
| MI | : Myocardial infarction. |
| MR | : Mitral regurgitation. |
| MRA | : Mineralocorticoid receptor antagonist. |
| NT-proBNP | : N-terminal prohormone of brain natriuretic peptide. |
| NYHA | : New York Heart Association. |
| PHT | : Pulmonary hypertension. |
| PND | : Paroxysmal nocturnal dyspnea. |
| RAAS | : Renin–angiotensin–aldosterone system. |
| RBBB | : Right bundle branch block. |
| RHD | : Rheumatic heart disease. |
| RV | : Right ventricle. |
| RVEF | : Right ventricular ejection fraction. |
| SGLT2 | : Sodium-glucose co-transporter 2 inhibitors. |
| TR | : Tricuspid regurgitation. |
| TSH | : Thyroid-stimulating hormone. |
| WBC | : White blood cell count. |

Approximately 50% of elderly patients with CHF aged over 75 years experience diastolic dysfunction, with long-term prognosis appearing comparable to that of systolic HF *[2]*. A prevailing concept suggests that elderly patients with preserved systolic function and impaired diastolic function are susceptible to HF episodes when exposed to stressors such as infections, renal impairment, anemia, exacerbations of chronic obstructive pulmonary disease (COPD), atrial fibrillation (AF), and inadequately controlled hypertension (HTN) and diabetes mellitus (DM).Careful management of exacerbating factors, associated comorbidities, adequate nutrition, and a supportive social environment may contribute to reducing the burden of HF in elderly patients; however, evidence supporting this remains limited.With disease progression and recurrent cardiovascular insults, left ventricular (LV) dilatation may progressively worsen, ultimately resulting in dysfunction as the final stage *[5]*.

The diagnosis and clinical management of HF in geriatric patients are complex due to the presence of multiple comorbidities, including HTN, AF, DM, chronic kidney disease (CKD), depression, arthritis, sensory impairment, cognitive dysfunction, and frailty. Furthermore, polypharmacy and an increased susceptibility to adverse drug effects further contribute to the challenges of HF care in this population *[3]*. Furthermore, the challenge is compounded by the atypical clinical presentation of HF in older adults. However, with appropriate clinical expertise and experience, the majority of geriatric HF cases can be accurately diagnosed and effectively managed *[6]*. Anemia is a predictor of worse outcomes in HF, contributing to decreased exercise tolerance and the aggravation of myocardial ischemia. Geriatric patients exhibit a heightened risk of developing anemia because of the high prevalence of comorbid conditions and the concurrent use of medications that predispose them to bleeding *[7]*. Frailty is closely linked to the development, clinical presentation, and prognosis of HF. Its core phenotype is characterized by slow gait speed, muscle weakness, physical inactivity, a subjective sense of exhaustion, and unintentional weight loss. Patients with CHF who exhibit frailty have are at heightened risk of one-year mortality and hospital re-admission at twice the rate of non-frail patients *[8]*.

*Challenges in the clinical management of HF in elderly patients:*

The efficacy and safety of evidence-based HF therapies in older adults remain uncertain due to their underrepresentation in clinical trials, often requiring extrapolation from studies conducted in younger populations. Older adults with acute decompensated heart failure (ADHF) exhibit an increased propensity for hospital admission and tend to present with more severe clinical manifestations compared to younger patients *[9]*. Guideline-directed medical therapy (GDMT) for HF is applicable to elderly adults; nonetheless, treatment should be patient-centered, consistent with individual care goals, appropriately dose-adjusted, and regularly evaluated for effectiveness and tolerability *[10]*.

Several factors contribute to the underutilization and/or suboptimal dosing of GDMT in older adults. These factors can be generally classified into patient-related factors, treatment-related considerations, and healthcare system attributes *[11]*. Patient-related factors that are particularly relevant in the older adults include lower blood pressure, reduced heart rate, decreased body mass index (BMI), and the presence of multiple comorbid conditions, frailty, cognitive dysfunction, polypharmacy, and inadequate social support. Treatment-related factors, including reduced tolerability, contraindications, and adverse effects, are more prevalent among Geriatric and physically frail individuals [12].

*Aim of study:*

The study aimed to delineate the clinical trajectory of elderly patients admitted with ADHF and to assess their prognosis and outcomes both during hospitalization and at a six-month follow-up with a focus on mortality, readmission rates, and functional recovery.

*Ethics Approval:*

Written informed consent was obtained from the patients, and ethical approval was granted by the Ethics Committee of the Faculty of Medicine, Alexandria University, under the approval number 0108021.

## Patients and Methods

*Study population:*

This study recruited 149 geriatric patients aged 60 years and above who were admittedto Alexandria Main University Hospital presenting with signs and symptoms of ADHF over a six-month period, from October 1, 2023, to March 1, 2024.

*Study design:*

This study is a prospective observational cohort study including 149 geriatric patients aged 60 years and above with ADHF, admitted to Alexandria Main University Hospital between October 2023 and March 2024, to assess their outcomes and prognosis.

*Assessment:*

Upon admission and at discharge, all patients underwent the following assessments: (1) Detailed history taking with an emphasis on the clinical manifestations of HF, - coexisting comorbid conditions, including DM, HTN, coronary artery disease (CAD), CKD, and anemia - medication history; - New York Heart Association (NYHA) functional classification; and - assessment using the Kansas City Cardiomyopathy Questionnaire (KCCQ) [13]. The Kansas City Cardiomyopathy Questionnaire (KCCQ) is a 23-item self-administered tool designed to independently evaluate patients' perceptions of their health status, encompassing HF symptoms, their impact on physical and social functioning, and the overall effect on quality of life. (2) Comprehensive clinical examination; (3) Laboratory investigations including complete blood count, blood urea, serum creatinine, serum uric acid, electrolyte levels (sodium and potassium), fasting blood glucose or glycosylated hemoglobin (HbA1c), lipid profile, aspartate aminotransferase (AST), alanine aminotransferase (ALT), and C-reactive protein; (3) Standard 12-lead electrocardiography (ECG) to identify arrhythmias, bundle branch block (BBB), or ST-segment and T-wave abnormalities; and (4) Echocardiographic parameters were evaluated in accordance with the guidelines of the European Society of Echocardiography and included the following: end-systolic and end-diastolic volume indices (ESVI and EDVI), left atrial volume index (LAVI), ejection fraction (EF) assessed by the Modified Simpson's method, estimated pulmonary artery systolic pressure, presence of valvular lesions, and resting regional wall motion abnormalities (RWMA). Follow-up was conducted six months after discharge to assess the following parameters: (a) NYHA functional classification; (b) KCCQ score; and (c) Echocardiographic parameters.

*Statistical analysis:*

Statistical analysis was conducted using SPSS version 26 (IBM Inc., Chicago, IL, USA). Quantitative variables were presented as mean ± standard deviation (SD) and compared between the two groups utilizing an unpaired Student's t-test. Qualitative variables were presented as frequency and percentage (%) and analyzed using the Chi-square test or Fisher's exact test, as deemed appropriate. A two-tailed *p*-value of <0.05 was regarded as indicative of statistical significance.

## Results

*Demographic parameters of the analyzed patient population. (Table 1):*

The study comprised 149 elderly patients aged 60 years or older diagnosed with ADHF who were admitted to Alexandria Main University Hospital between October 2023 and March 2024. The age range of the patients included in the study was between 60 and 88 years, with a mean ± standard deviation (SD) of 66.7±5.5 years. The cohort included 98 male patients (65.7%) and 51 female patients (34.2%). Among the studied patients, HF was attributed to multiple overlapping etiologies, including hypertensive HF in 99 patients (66.4%), ischemic cardiomyopathy (ICM) in 98 patients (65.7%), dilated cardiomyopathy (DCM) in 44 patients (29.5%), and valvular HF in 15 patients (10.0%). The prevalent comorbidities among the studied patients included HTN in 99 patients (66.4%), DM in 81 patients (54.3%), CKD in 44 patients (29.5%), and cerebrovascular disease (CVS) in 20 patients (13.4%). With respect to the onset of HF, 87 patients (58.3%) presented with CHF, while 63 patients (42.2%) had de novo HF. Regarding the classification of HF, 120 patients (80.5%) had HFrEF, 19 patients (12.7%) had HFpEF, and 10 patients (6.7%) had HFmrEF. In terms of smoking status, 57 patients (38.2%) were current smokers, 18 patients (12.0%) were former smokers, and 74 patients (49.6%) were non-smokers. (Table 2).

Laboratory tests Hemoglobin levels varied within the range of 6.9 and 18.1g/dL, with a mean ± standard deviation (SD) of 11.8±2.4g/dL. White blood cell count varied between 2 and 19 × $10^9$/L, with a mean ± SD of 9.9±3.5 × $10^9$/L. Platelet count Platelet count varied between 75 and 563 × $10^9$/L, with a mean ± SD of 276.9±89.5 × $10^9$/L. Low density lipoprotein (LDL) levels spanned from 26 to 208mg/dL, with a mean ± standard deviation (SD) of 67.8±32.6 mg/dL.High density lipoprotein (HDL) levels varied between 16 and 97mg/dL, with a mean ± SD of 35.4±13.6mg/dL. Total cholesterol levels varied within the range of 64 and 389mg/dL, with a mean ± SD of 178.0±72.1mg/dL. Triglyceride (TG) levels varied between 24 and 320mg/dL, with a mean ± SD of 76.3±49.3mg/dL. HbA1c levels ranged between 4.5% and 13.0%, with a mean ± standard deviation (SD) of 7.8±2.0%. TSH levels varied between 0.03 and 29.0mIU/L, with a mean ± SD of 4.3±5.7mIU/L. Serum iron levels ranged between 11 and 55µg/dL, with a mean ± SD of 32.9±10.9µg/dL. High-sensitivity troponin I levels varied within the range of 0 and 10ng/mL, with a mean ± standard deviation (SD) of 0.7±1.6ng/mL. Blood urea levels ranged between 12 and 328mg/dL, with a mean ± SD of 63.8±44.7mg/dL. Serum creatinine levels varied within the range of 0.42 and 13.0mg/dL, with a mean ± SD of 1.4±1.1mg/dL. Serum sodium levels ranged between 115.0 and 139.5mEq/L, with a mean ± standard deviation (SD) of 145.1±103.2mEq/L. Serum potassium levels varied between 2.8 and 5.3mEq/L, with a mean ± SD of 4.3±0.6mEq/L.(Table 3).

Table (1): Demographic characteristics and laboratory findings of the patient population.

| | | | (n = 149) | |
|---|---|---|---|---|
| Age (years) | Mean ± SD | | 66.7±5.5 | |
| | Range | | 60 – 88 | |
| Gender | Male | | 98 (65.7%) | |
| | Female | | 51 (34.2%) | |
| Etiology | Hypertensive | | 99 (66.4%) | |
| | Ischemic | | 98 (65.7%) | |
| | Dilated | | 44 (29.5%) | |
| | Valvular | | 15 (10.0%) | |
| Co morbidities | HTN | | 99 (66.4%) | |
| | DM | | 81 (54.3%) | |
| | CKD | | 44 (29.5%) | |
| | CVS | | 20 (13.4%) | |
| | Chronic HF | | 87 (58.3%) | |
| | De novo | | 63 (42.2%) | |
| Type of heart failure | Reduced | | 120 (80.5%) | |
| | Preserved | | 19 (12.7%) | |
| | Mildly reduced | | 10 (6.7%) | |
| Smoking | Smoker | | 57 (38.2%) | |
| | Ex-smoker | | 18 (12.0%) | |
| | Non-smoker | | 74 (49.6%) | |
| CBC | Hemoglobin | Mean ± SD 11.8±2.4 | | Range 6.9 – 18.1 |
| | WBCS | Mean ± SD 9.9±3.5 | | Range 2 – 19 |
| | Platelets | Mean ± SD 276.9±89.5 | | Range 75 – 563 |
| Lipid profile | LDL | Mean ± SD 67.8±32.6 | | Range 26 – 208 |
| | HDL | Mean ± SD 35.4±13.6 | | Range 16 – 97 |
| | Cholesterol | Mean ± SD 178.0±72.1 | | Range 64 – 389 |
| | Triglycerides | Mean ± SD 76.3±49.3 | | Range 24 – 320 |
| HbA1c | Mean ± SD 7.8±2.0 | | Range 4.5 – 13.0 | |
| TSH | Mean ± SD 4.3±5.7 | | Range 0.03 – 29.0 | |
| Iron | Mean ± SD 32.9±10.9 | | Range 11 – 55 | |
| Troponin I | Mean ± SD 0.7±1.6 | | Range 0 – 10 | |
| Urea | Mean ± SD 63.8±44.7 | | Range 12 – 328 | |
| Creatinine | Mean ± SD 1.4±1.1 | | Range 0.42 – 13.0 | |
| Sodium | Mean ± SD 145.1±103.2 | | Range 115.0 – 139.5 | |
| Potassium | Mean ± SD 4.3±0.6 | | Range 2.8 – 5.3 | |

*Age distribution among the various types of heart failure:*

Patients were stratified into three age groups: Age group 60–70 years: Among this group, 81 patients (81.8%) had HFrEF, 11 patients (11.1%) had HFpEF, and 7 patients (7.0%) had HFmrEF. Age group 70–80 years: This group comprised 35 patients (77.7%) with HFrEF, 7 patients (15.6%) with HFpEF, and 3 patients (6.6%) with HFmrEF. Age group 80–88 years: Among these patients, 4 (80%) had HFrEF, while 1 (20%) had HFpEF. There was an insignificant correlation between heart failure type and age groups.

*Gender distribution among different types of heart failure:*

Among male patients, 89 (90.82%) had HFrEF, 3 (3.06%) had HFpEF, and 6 (6.12%) had HFmrEF. Among female patients, 31 (60.78%) were diagnosed with HFrEF, 16 (31.37%) with HFpEF, and 4 (7.84%) with HFmrEF.

A significant difference in HF type was observed between male and female patients ($p<0.001$).

*Precipitating factors of ADHF in the study population:*

In the elderly HF patients included in this study, various precipitating factors for ADHF were identified. These included non-compliance in 53 patients (35.5%), respiratory infection in 33 patients (22.1%), myocardial ischemia in 28 patients (18.7%), tachyarrhythmia in 14 patients (9.4%), urinary tract infection in 12 patients (8.0%), anemia in 8 patients (5.3%), and acute kidney injury (AKI) in 18 patients (12.0%).

*Clinical characteristics of the studied patient cohort:*

The patients exhibited various clinical manifestations, with exertional dyspnea reported in 147 patients (98.6%). According to the NYHA functional classification, 99 patients (66.4%) were classified as NYHA grade III, 46 patients (30.8%) as NYHA grade IV, and 2 patients (1.4%) as NYHA grade II.Additionally, orthopnea was reported in 107 patients (71.8%), while paroxysmal nocturnal dyspnea (PND) was observed in 110 patients (73.8%). Edema was observed in the study cohort in various forms, including lower limb edema in 54 patients (36.2%), scrotal edema in 15 patients (10.0%), and anasarca in 15 patients (10.0%). Chest pain was the primary presenting symptom in 43 patients (28.8%), with 29 patients (19.4%) experiencing anginal chest pain and 14 patients (9.4%) presenting with atypical chest pain (Fig. 1).

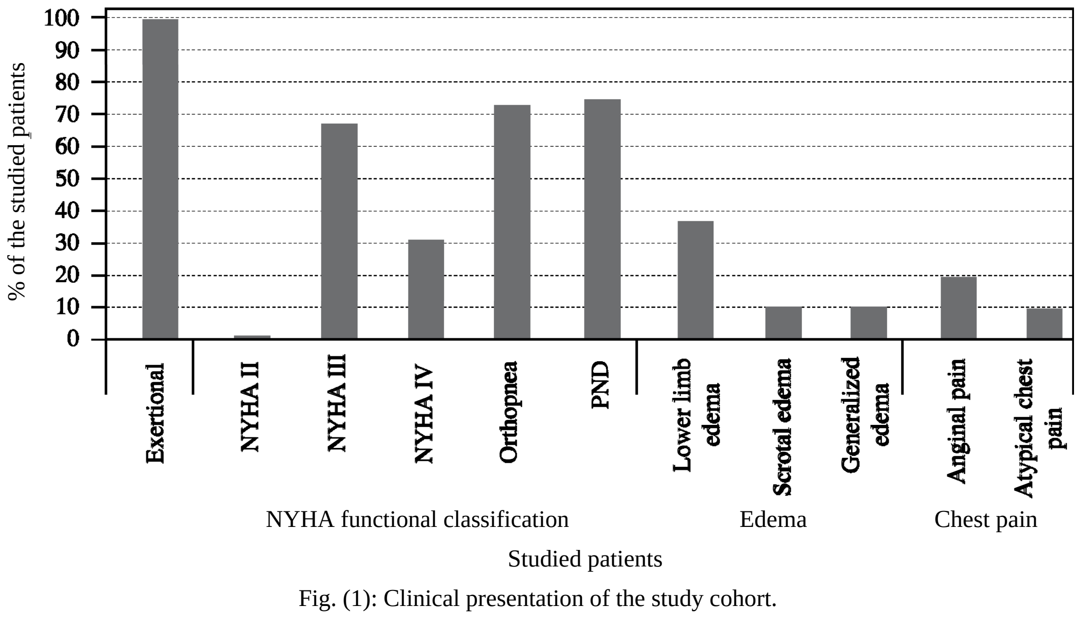


Fig. (1): Clinical presentation of the study cohort.

NYHA: New York Heart Associationa

*Vital signs of studied patients at admission, discharge, and follow-up:*

In the studied patients, heart rate varied within the range of 60 and 180 beats per minute, with a mean ± standard deviation (SD) of 100.3±22.3 beats per minute. Systolic blood pressure varied between 70 and 180 mmHg, with a mean ± SD of 111.6±19.5 mmHg, while diastolic blood pressure ranged from 50 to 100 mmHg, with a mean ± SD of 69.3±11.6 mmHg. In the studied patients, heart rate was significantly lower at discharge and at the six-month follow-up in comparison to the heart rate at admission ($p$=0.021 and $p$<0.001, respectively). However, diastolic blood pressure demonstrated a significant reduction at discharge and during the six-month follow-up relative to baseline values ($p$=0.013 and $p$= 0.009, respectively).

*Electrocardiographic analysis of the study cohort:*

Sinus tachycardia was observed in 47 patients (31.5%), while AF was detected in 41 patients (27.5%). Electrocardiographic findings revealed BBB in 25 patients (16.7%), with right bundle branch block (RBBB) present in 11 patients (7.38%) and left bundle branch block (LBBB) in 14 patients (9.4%). In relation to ischemic changes on electrocardiography (ECG), pathological Q waves were identified in 22 patients (14.7%), while ST depression (STD) was observed in 13 patients (8.7%). Additionally, ST elevation (STE) was reported in 15 patients (10.0%), and T-wave inversions (TWI) were documented in 20 patients (13.4%).

*Echocardiographic parameters of the study population (Table 2):*

Upon admission, mitral regurgitation (MR) was diagnosed in 102 patients (68.4%), while tricuspid regurgitation (TR) was noted in 94 patients (63.0%). No statistically significant change was observed in the severity of MR and TR from admission to discharge or at the six-month follow-up, with MR showing *p*-values of 0.424 and 0.23, respectively, and TR showing *p*-values of 0.450 and 0.078, respectively.

Upon admission, EF varied between 12% and 67%, with a mean (± SD) of 33.3±13.8%. Among the study cohort, 120 patients (80.45%) were classified as having HFrEF, 19 patients (12.7%) had HFpEF, and 10 patients (6.7%) had HFmrEF. A significant improvement in EF was observed at both discharge and the follow-up at six months ($p<0.001$ for both time points).

Among the study cohort, 88 patients (59.0%) demonstrated preserved right ventricular global systolic function, while 61 patients (40.9%) exhibited reduced right ventricular global systolic function. Tricuspid annular plane systolic excursionvaried within the range of 0.9 and 3.0cm, with a mean (± SD) of 1.89±0.58cm at the time of admission. There was an insignificant change in tricuspid annular plane systolic excursion during follow-up ($p=0.297$).

In the echocardiographic assessment at admission, EDV varied within the range of 111 and 325 mL, with a mean (± SD) of 167.2±43.7mL and an insignificant change in EDV was observed during the follow-up echocardiographic evaluation ($p=0.756$). On the other hand, ESV varied between 50 and 285 mL, with a mean (± SD) of 116.0±45.9mL without significant changes in ESV at the six-month follow-up ($p=0.814$), and there was no evidence of reverse LV remodeling. At admission, dilated LV dimensions were present in 84 patients (56.38%), without significant improvement at discharge ($p=0.24$). However, at the six-month follow-up, a significant reduction in LV dilatation was observed ($p<0.008$), though this did not correspond to reverse LV remodeling.

RWMA were detected in 98 patients (66.4%), with a significant improvement observed at discharge and during follow-up ($p<0.001$ for both time points).

Pulmonary hypertension (PHT) was identified in 27 patients (18.1%) at admission and an insignificant improvement was observed at discharge or during the six-month follow-up period ($p=0.46$ and $p=0.47$, respectively).

LV apical mural thrombus was detected in 9 patients (6.0%) at admission. Upon discharge, thrombus resolution was observed in 2 patients, with further resolution in 5 patients at the 6-month follow-up. However, these changes were statistically-insignificant ($p=0.607$ and $p=0.569$, respectively).

*Pharmacological management in the study population (Table 3):*

At admission, optimal pharmacological therapy was achieved in 34 patients (22.82%), while suboptimal drug administration was observed in 57 patients (38.26%). Additionally, 58 patients (39.93%) were not receiving any drug therapy.However, the number of patients receiving optimal medical therapy significantly increased at both discharge and follow-up ($p=0.0009$ and $p=0.0007$, respectively). In addition, a significant reduction was shown in the number of patients not receiving any drug therapy at the 6-month follow-up ($p=0.0007$).

Various factors contributing to suboptimal drug administration were identified, including elevated creatinine levels in 15 patients (26.3%), hypotension in 22 patients (38.6%), and bradycardia in 7 patients (12.2%). Additionally, 13 patients (22.8%) demonstrated noncompliance with treatment.During the follow-up period, 57 patients (42.2%) received optimal pharmacological therapy, while 78 patients (57.7%) did not achieve optimal drug management.

*Clinical course of HF population during hospitalization:*

During the hospitalization period, which ranged from 2 to 6 weeks, 42 patients (28.1%) experienced an uncomplicated hospital course. In contrast, 107 patients (71.8%) developed complications during their hospital stay. Severe anemia requiring intervention was observed in 66 patients (44.2%), with 52 patients (34.8%) receiving iron supplementation and 14 patients (9.3%) requiring blood transfusion. Additionally, AKI was reported in 20 patients (13.1%). More severe complications were observed in 7 patients (4.6%) who developed cardiogenic shock and required vasopressor support. Additionally, 14 patients (9.3%) required endotracheal intubation and mechanical ventilation. Mortality was recorded as an adverse outcome, with in-hospital mortality documented in 14 patients (9.3%).

Table (2): Echocardiographic parameters of the study population.

| | Admission (n=149) | Discharge (n = 135) | Follow-up (n=135) |
|---|---|---|---|
| *Valvular lesions:* | | | |
| MR | 102 (68.4%) | 91 (67.4%) | 87 (64.4%) |
| *p*-value | | 0.424 | 0.23 |
| TR | 94 (63.09%) | 80 (59.25%) | 74 (54.8%) |
| *p*-value | | 0.450 | 0.078 |
| *EF (%):* | | | |
| Mean ± SD | 33.32±13.89 | 38.6±5.86 | 39.3±5.23 |
| Range | 12-67 | 28-58 | 29-53 |
| *p*-value | | <0.001* | <0.001* |
| *LVSF:* | | | |
| Reduced LVSF | 120 (80.45%) | | |
| Mildly reduced LVSF | 10 (6.71%) | | |
| Preserved LVSF | 19 (12.75%) | | |
| *TAPSE (cm):* | | | |
| Mean ± SD | 1.89±0.58 | | 1.9±0.5 |
| Range | 0.9-3.0 | 0.9-3 | |
| *p*-value | | | 0.297 |
| *RVGSF:* | | | |
| Preserved RVSF | 88 (59.06%) | | |
| Reduced RVSF | 61 (40.94%) | | |
| *EDV (ml):* | | | |
| Mean ±SD | 167.28±43.7 | | 168±40.7 |
| Range | 111-325 | | 112-322 |
| *p*-value | | | 0.756 |
| *ESV (ml):* | | | |
| Mean ± SD | 116.05±45.91 | | 114±45.91 |
| Range | 50-285 | | 48-283 |
| *p*-value | | | 0.814 |
| Dilated dimensions | 84 (56.38%) | 70 (52.35%) | 57 (42.2%) |
| *p*-value | | 0.24 | <0.008* |
| Regional wall motion abnormalities | 98 (66.44%) | 50 (37.0%) | 36 (26.7%) |
| *p*-value | | <0.001* | <0.001* |
| PHT | 27 (18.12%) | 25 (18.51%) | 24 (17.8%) |
| *p*-value | | | |
| LV apical thrombus | 9 (6.04%) | 7 (4.7%) | 4 (3.96%) |
| *p*-value | | 0.46 | 0.47 |

*Significant as *p*-value ≤0.05.
ECHO: Echocardiogram.
MR : Mitral regurgitation.
TR : Tricuspid regurgitation.
PHT : Pulmonary hypertension.
LVSF: Left ventricular systolic function.
RVGSF: Right ventricular global systolic function.

*HF Hospital Readmission:*

Among the 149 patients, 50 patients (33.5%) did not require readmission, while 99 patients (66.4%) were re-hospitalized due to ADHF within 1 to 2 months following discharge.The causes of hospital readmission included sepsis in 28 patients (18.7%), AKI in 25 patients (16.7%), non-compliance with medications in 17 patients (11.4%), AF in 14 patients (9.3%), ischemia in 9 patients (6.2%), and anemia in 6 patients (3.8%), (Fig. 2).

*Clinical assessment during follow-up:*

A comparison of patients at discharge based on the NYHA functional classification for exertional dyspnea revealed a statistically significant improvement in NYHA functional class ($p<0.001$). This improvement was sustained throughout the six-month follow-up period ($p<0.001$). In regard to the KCCQ score, a significant improvement was noted from admission to discharge. At admission, the KCCQ score was classified as poor (0–<25), ranging from 14 to 40, with a mean of 27±13. By discharge, the score had significantly improved to fair (25–<50) and good (50–<75), ranging from 48 to 69, with a mean of 58±10 ($p<0.001$). However, the improvement in the KCCQ score from admission to the six-month follow-up period was statistically insignificant ($p<0.010$). No mortality was observed throughout the follow-up period.

Table (3): Pharmacological therapy in the study cohort.

| | Admission (n=149) | Discharge (n = 135) | Follow-up (n=135) | *p*-value |
|---|---|---|---|---|
| *Drug administration:* | | | | |
| Optimum drug administration | 34 (22.8%) | 54(40.0%) | 57 (42.2%) | $p1 = 0.0009$* <br> $p2 = 0.0007$* |
| Non optimum drug administration | 57 (38.2%) | 40 (29.6%) | 49 (36.3%) | $p1 = 0.06$ <br> $p2 = 0.36$ |
| No drug administration | 58 (38.9%) | 41 (30.3%) | 29 (21.4%) | $p1 = 0.064$ <br> $p2 = 0.0007$* |
| | Admission (n = 57) | Discharge (n=40) | Follow-up (n=49) | |
| *Causes of non-optimum drug administration:* | | | | |
| High creatinine | 15 (26.3%) | 10 (25.0%) | 13 (26.5%) | $p1 = 0.21$ <br> $p2 = 0.25$ |
| Low blood pressure | 22 (38.6%) | 12 (30.0%) | 14 (28.6%) | $p1 = 0.192$ <br> $p2 = 0.140$ |
| Low heart rate | 7 (12.2%) | 12 (30.0%) | 15 (30.6%) | $p1 = 0.016$* <br> $p2 = 0.011$* |
| Non-compliance | 13 (22.8%) | 8 (20.0%) | 7 (14.2%) | $p1 = 0.370$ <br> $p2 = 0.130$ |

*p*1: Compare study group at admission and at discharge. *p*2: Compare study group at admission and at follow- up.

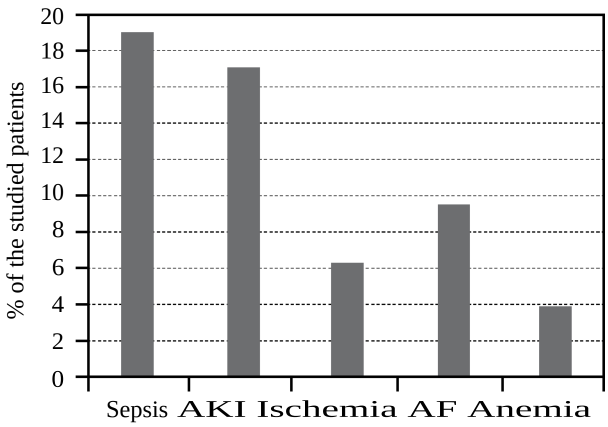


Fig. (2): Causes of HF Readmission in the Study Population.

## *Discussion*

HF is a multifaceted cardiovascular syndrome that disproportionately affects the elderly population, with its prevalence and incidence increasing due to the aging demographic trends. HF management in elderly patients *[14]* is further challenged by age-related physiological alterations, including endothelial dysfunction, chronic inflammation, atherosclerosis, reduced cardiac output, and impaired diastolic function.

This study utilized a prospective cohort design to analyze 149 elderly patients presented to Alexandria Main University Hospital with signs and symptoms of ADHF. The present study showed that the mean age of the study patients was 66.7 years, with a predominance of male patients (65.7%). Contrary to our findings, patients with ADHF in developed regions typically present with a median age exceeding 75 years. Conversely, in other regions, such as Latin America and Africa, the median age at presentation is up to 20 years lower. This disparity may be attributed to inadequately managed hypertension, ischemic heart disease (IHD), and late-diagnosed rheumatic heart disease, leading to HF presentation at a younger age *[15]*, predominantly in males. However, the lifetime risk of HF remains comparable between males and females, as females generally have greater longevity. Consistent with our findings, Vaartjes et al. (2010) *[16]* demonstrated that men have an increased risk of both short- and long-term complications, as females exhibit more favorable physiological remodeling compared to males [17].

In our study, the most prevalent etiology of HF was hypertensive HF, followed by ICM and DCM secondary to myocarditis and autoimmune disorders. Additionally, valvular HF was commonly observed, attributed to the high prevalence of rheumatic heart disease in our country, as well as in Africa and other developing regions [18]. In Egypt, HTN is highly prevalent among the elderly population and serves as a primary contributing factor to the onset of ischemic heart disease (IHD).

In the present study, HFrEF was the most prevalent subtype, affecting 80.5% of elderly patients. This observation is in accordance with previous studies, which have shown that HFrEF is more common, especially in individuals with significant comorbidities such as HTN and coronary artery disease (CAD). HFrEFis often linked to worse clinical outcomes, including elevated mortality rates and higher incidences of hospital readmission. This observation is corroborated by a study conducted by Dunlay et al. [19], which demonstrated that patients with HFrEF Exhibited a poorer prognosis compared to individuals with HFpEF. These resultss emphasize the significance of implementing more aggressive management strategies to mitigate adverse outcomes in this patient population. Although HFpEF was less prevalent in the present study (12.7%), it is increasingly acknowledged in HF research, particularly among older adults and individuals with comorbid conditions such as HTN and obesity. In contrast to our findings, prior studies have demonstrated that HFpEF is the dominant phenotype of HF among the elderly population [20].

Regarding gender differences, a significant variation was observed in the distribution of HF subtypes between males and females ($p$<0.001). HFrEF was more prevalent among elderly male patients, affecting 90.82% of them, likely due to the higher prevalence of IHD as an underlying etiology in this group. Consistent with our findings, previous research has shown that men are more likely to develop systolic HF, often attributed to underlying IHD and HTN [21]. Conversely, HFpEF was significantly more prevalent among female patients (60.7%). This higher prevalence in elderly women may be attributed to physiological differences in cardiovascular aging, including postmenopausal hormonal changes and distinct patterns of ventricular remodeling. In alignment with our findings, studies have indicated that women are more susceptible to diastolic dysfunction, which may increase their risk of developing HFpEF [22].

The findings of this study demonstrated elevated HbA1c levels, with a mean value of 7.8%, indicating poor glycemic control. This supports the role of DM as a significant comorbidity in the studied patients. DM is a recognized risk factor for the development of HF, with even borderline glycemic control contributing to disease progression through mechanisms including elevated oxidative stress and impaired endothelial function [23].

Elevated levels of troponin I, a biomarker indicative of myocardial injury, suggest ongoing cardiac stress or damage in a substantial proportion of patients with ICM identified in 65.7% of the study population. Elevated troponin levels are commonly observed in HF due to increased myocardial strain and the presence of underlying CAD [24]. This finding highlights the potential benefit of close monitoring of troponin levels to recognize patients at increased risk for adverse cardiac outcomes, enabling timely intervention.

Concerning the precipitating factors of ADHF, non-compliance was identified as the primary cause, accounting for 35.5% of cases in the study population. Non-compliance poses a substantial challenge in the management of chronic conditions such as HF, where strict adherence to prescribed medication regimens is essential for preventing disease progression and clinical deterioration. Wu et al. [25] identified multiple factors contributing to non-compliance, including limited understanding of the condition, cognitive decline, complex medication regimens, adverse drug effects, and insufficient social support. Non-compliance with treatment plans increases the likelihood of symptom exacerbation, leading to acute decompensation that frequently necessitates hospitalization [25]. A systematic review by McAlister et al. [26] highlighted the importance of comprehensive patient education and enhanced access to support systems to improve adherence to prescribed therapies across diverse social and educational backgrounds. The implementation of home-based care programs and routine outpatient monitoring may play a pivotal role in mitigating these challenges, thereby reducing hospital readmission rates and mortality.

Respiratory tract infections represented the second most prevalent precipitating factor for ADHF within the study cohort, accounting for 22.1% of cases. Respiratory infections can aggravate HF by elevating pulmonary pressures and compromising gas exchange, thereby imposing further stress on the already impaired myocardium. Peng and Yang [27] reported that elderly patients with HF are particularly vulnerable to pulmonary infections, which can readily precipitate decompensation due to their diminished cardiovascular reserve.

Ischemia was determined to be the third most common precipitating factor for ADHF in our study, contributing to 18.7% of cases. This result is in accordance with prior studies that have identified ischemia as a significant precipitating factor for heart failure exacerbations, particularly in individuals with a history of CAD. Ural et al., [28] highlight that the optimal management of ischemia through revascularization and pharmacological therapy is crucial in mitigating the risk of HF exacerbations. Notably, a recent study by Veskovic et al., [29] presents findings that contradict our results, suggesting that psychological factors, including depression and anxiety, may Assume a more prominent role in precipitating ADHF than previously acknowledged etiologies. Their results suggest that patients with increased levels of depression findings indicate that patients with elevated levels of depression and anxiety had an increased likelihood of rehospitalization due to heart failure decompensation. This discrepancy may be attributable to differences in study populations, as our cohort may have been predominantly characterized by traditional risk factors and influenced by the nature of our community, where significant emphasis is placedon the management of older patientss. Conversely, the study by Veskovic et al. [29] incorporated a more comprehensive evaluation of psychosocial determinants [29]. Further investigation into additional contributing factors, including psychosocial stressors, may provide a more thorough understanding of the etiologies of ADHF and enhance strategies for its prevention and management.

The predominant clinical presentation in the study cohort was exertional dyspnea (98.6%), with a majority classified under the NYHA functional classification (66.4%), followed by PND (73.8%) and orthopnea (71.8%). A study involving 5,771 older adults aged 65 years and above residing in the community yielded similar findings, with 660 participants (approximately 11.4%) reporting PND. This study further demonstrated that the absence of PND and orthopnea exhibited a high negative predictive value (exceeding 97%) in ruling out heart failure within this population.(30)Another study involving 276 patients diagnosed with heart failure reported a higher prevalence of self-reported PND at 23.6% among outpatients. These findings suggest that PND is more frequently observed in elderly individuals with preexisting cardiac conditions [31].

The most frequently observed electrocardiographic abnormality in our study was sinus tachycardia, detected in 31.5% of patients. Sinus tachycardia typically represents a compensatory response to heightened sympathetic activity secondary to reduced cardiac output. However, sustained tachycardia may have detrimental impact on cardiac function, potentially contributing to the development of tachycardia-induced cardiomyopathy. Although data on the incidence of sinus tachycardia in HF elderly patients remain limited, it is well established that advancing age serves as a distinct risk factor for the development of various arrhythmias, including tachyarrhythmias. Structural and electrical remodeling of cardiac tissue in patients aged 80 years and above contributes to their heightened susceptibility to arrhythmias [32]. However, in elderly patients, sinus tachycardia is often a physiological response to underlying conditions such as anemia, infection, or HF itself, rather than a primary arrhythmia.AF was the second most prevalent electrocardiographic abnormality, identified in 27.5% of patients. As age advances, the prevalence of atrial fibrillation (AF) increases, making it the most common arrhythmia in individuals over 65 years. AF in HF patients is of significant concern due to its reciprocal impact on cardiac function, as HF increases the risk of AF, while AF further deteriorates HF symptoms. Verhaert et al., [33] examined the complex interplay between AF and HF, highlighting that AF significantly elevates the risk of stroke and negatively affects the prognosis in patients with HF. Notably, in our cohort, electrocardiographic ischemic changes and AF were more frequently observed in patients with HFpEF.

Echocardiographic evaluation demonstrated a high prevalence of MR (67.4%) and TR (59.2%), with no significant improvement observed during follow-up. The elevated incidence of valvular incompetence among patients with heart failure is consistent with the the findings of Tribouilloy et al., [34] who determined significant valvular disease as a major contributor to adverse HF outcomes.

The mean EF demonstrated a significant improvement throughout the hospitalization period, increasing from an average of 33.3% at admission to 39.3% at follow-up ($p$<0.001 for both time points). Although the improvement in EF was statistically significant, a substantial proportion of patients remained classified within the HFrEF category, underscoring the chronic nature of systolic dysfunction in the studied population. This distribution highlights the predominance of reduced systolic function within this cohort, In accordance with the findings of Lam et al., [21] who documented that HFrEF is the most prevalent form among patients with multiple comorbidities, particularly in older adults.

In addition to EF, other parameters, including left ventricular volumes and dimensions, were increased, indicating significant cardiac remodeling. However, despite a significant reduction in left ventricular internal dimensions during the follow-up period ($p$<0.008), no evidence of reverse cardiac remodeling was observed. Yancy et al., [35] recognized ventricular dilatation as a significant prognostic indicator of negative clinical outcomes in HF, highlighting the importance of early and aggressive intervention to mitigate ventricular remodeling. Several studies have investigated the correlation between reductions in dilated cardiac dimensions and reverse remodeling in patients with DCM. Merlo et al., reported that LV reverse remodeling occurred in approximately 37% of patients using individualized medical treatment and demonstrated an association with a more favorable prognosis. Additionally, Certain baseline predictors, including elevated systolic blood pressure and no evidence of LBBB, were associated with LV reverse remodeling, indicating that patient-specific factors influence the extent of cardiac remodeling. These findings underscore that while certain patients with dilated cardiac dimensions experience significant reverse remodeling in response to medical therapy, others may exhibit only modest improvements that do not achieve statistical significance *[36]*.

PHT was present in 18.1% of patients at admission, with a minimal reduction to 17.8% at the 6-month follow-up, which was not statistically significant. The persistence of PHT despite treatment indicates sustained right ventricular pressure overload and elevated pulmonary venous pressure. PHT in patients with HF is linked to poorer clinical outcomes. Even in the absence of statistical significance, any improvement in PHT is a favorable indicator, as elevated pulmonary pressures are strongly correlated with worse outcomes in patients with HF *[37]*.

The significant improvement in RWMA observed in the cohort at discharge and during follow-up ($p$<0.001 for both periods) with both revascularization and optimal medical therapy aligned with studies demonstrating that a considerable proportion of patients demonstrate improvement in wall motion abnormalities, both at rest and during exercise following successful angioplasty. This indicates that revascularization not only relieves ischemia but also improves myocardial contractility during physical activity *[40]*. Pharmacological therapy is essential in the management of RWMA, especially in cases where revascularization is not a viable option *[38]*.

Concerning medication adherence, the proportion of patients maintained on optimal pharmacotherapy significantly increased at discharge (40.0%) and during the follow-up period (42.2%) compared to admission (22.82%), with a clinically significant and statistically validated difference ($p$=0.0009 and $p$=0.0007, respectively). Furthermore, the patient population size unable to achieve the optimal drug dosage due to non-compliance during the follow-up period demonstrated a noticeable but statistically insignificant decline. Additionally, at follow-up, a substantial decrease was observed in the proportion of patients not receiving any pharmacological therapy ($p$=0.0007).

Conversely, suboptimal drug administration remained a concern, as 36.3% of patients did not achieve the maximum tolerated doses of optimal medical therapy at the 6-month follow-up. This was attributed to various factors, including elevated creatinine levels and low blood pressure, underscoring the ongoing challenges in optimizing HF treatment while mitigating potential adverse effects in the elderly study cohort with multiple comorbidities at admission *[37,39]*.

In our study, bradycardia observed during follow-up was a primary factor limiting the optimization of HF GDMT. Elderly patients with HF were more likely to exhibit lower heart rates and impaired renal function compared to their younger counterparts *[40]*.

Similar findings were reported in a study conducted in an urban emergency department, which found that 6.2% of older adults presented with symptomatic bradycardia, with 16% of these cases classified as unstable *[41]*. In the management of HF, certain medications may contribute to the exacerbation of bradycardia. β-blockers, which are frequently prescribed for HF treatment, are well known for their heart rate-lowering effects. In older patients, this effect may require dose adjustments to optimize therapeutic benefits while minimizing the risk of significant bradycardia *[42]*. Furthermore, the concomitant use of β-blockers with other medications, such as digoxin, may further elevate the risk of bradycardia. Therefore, vigilant monitoring and appropriate dose adjustments are crucial in the clinical management of elderly patients with HF to mitigate the risk of exacerbating bradycardia *[43]*.

Our study revealed a notably low utilization of GDMT among HF patients, with only 42.6% undergoing treatment with angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) and 48% receiving β-blockers. This trend of underutilization is in alignment with the findings of Parajuli et al., *[44]* who reported that a significant proportion of ambulatory HF patients did not undergo optimal therapeutic management despite the existence of well-established guidelines. The hesitation to fully implement these therapies may be attributed to patient complexities, including the presence of comorbidities and polypharmacy, which pose challenges to adherence to standard treatment protocols.

Our study demonstrated an increased incidence of complications during hospitalization, along with a high mortality rate, among elderly HF patients. This population exhibited greater vulnerability to intubation and mechanical ventilation, AKI, cardiogenic shock, and the need for vasopressor support, as well as prolonged hospital stays. Additionally, there was a high rate of HF readmission within one to two months post-discharge.Conversely, no mortality was observed post-discharge or throughout the follow-up period.

Aligned with our findings, research has indicated that elderly patients have an increased likelihood of requiring invasive respiratory support due to reduced physiological reserves and the presence of multiple comorbidities. A multicenter cohort study of patients in critical condition requiring mechanical ventilatory support demonstrated that individuals aged ≥70 years had significantly higher in-hospital mortality rates (50%) compared to younger patients (23%). Additionally, the study found that elderly patients who underwent invasive mechanical ventilation (IMV) experienced worse outcomes than those managed with non-invasive respiratory support (NIRS) [45].

The use of vasopressors in HF patients is frequently required to manage hemodynamic instability and cardiogenic shock. Older patients often require vasopressors more frequently due to age-related reductions in cardiac function and vascular compliance. Although age-stratified data on vasopressor use in HF patients remain limited, the higher prevalence of comorbidities, such as sepsis, in older adults with HF indicates an elevated likelihood of vasopressor administration. The therapeutic approach to sepsis in patients with preexisting HF typically necessitates the judicious administration of vasopressors, such as norepinephrine, to ensure adequate tissue perfusion [46].

Findings from the ALARM-HF registry indicated that the in-hospital mortality rate is estimated to be around 11%.The latest data from the National Heart Failure Audit [47] in the UK (7) provides a more comprehensive overview. Among the 56,915 hospital admissions recorded in the audit from April 2014 to March 2015, the total in-hospital mortality rate was recorded at 9.6%. Nevertheless, a notable variation in mortality rates was observed, with patients younger than 75 years exhibiting a mortality rate of 4.8%, compared to 12% in those older than 75 years. Post-discharge mortality remains elevated and has shown no significant improvement over time.

Our findings indicated that 33.5% of patients did not require readmission, whereas 66.4% were rehospitalized for ADHF within 1–2 months post-discharge. The leading causes of readmission, in descending order, were sepsis (18.7%), AKI (16.7%), non-compliance with treatment (11.4%), and AF (9.3%). Consistent with our findings, a study by Chaudhry et al., [48] emphasized that the risk of readmission is particularly elevated within the first 30 days post-discharge, often attributed to insufficient follow-up care and the progression of preexisting conditions.

Readmission was linked to poorer clinical outcomes, irrespective of patient age and renal function status. Psychosocial factors, including anxiety, depression, cognitive impairment, and social isolation, are linked to an elevated risk of unanticipated recurrent hospital readmission or death in patients after hospitalization for ADHF [49]. These findings highlight the necessity of implementing structured post-discharge care strategies to enhance patient outcomes.

Furthermore, our findings highlight the complexities of managing elderly patients with HF, as short-term stabilization during hospitalization does not necessarily translate into sustained long-term improvement. Research has demonstrated that patients with HF frequently experience recurrent exacerbations, resulting in repeated hospitalizations. For instance, Dharmarajan et al., [50] reported that a considerable proportion of HF readmissions occur within the first 60 days, emphasizing the importance of early interventions and continuous monitoring after discharge. The implementation of enhanced follow-up care, including telemedicine and outpatient HF clinics, may help reduce the high incidence of early readmissions.

The follow-up data in this study reveal notable improvements as well as ongoing challenges in the management of older adults with HF following hospital discharge. Notably, both EF and RWMA demonstrated significant improvement from admission to six-month follow-up ($p$<0.001 and $p$=0.006, respectively). This improvement indicates effective management during hospitalization and the subsequent recovery period, potentially reflecting the benefits of optimized HF therapies [31].

Finally, follow-up clinical assessments exhibited a substantial enhancement in NYHA functional classification, with the majority of patients transitioning from more severe functional classes at admission (77.1% in class III and 18.1% in class IV) to milder classifications at follow-up. Specifically, at follow-up, 98.8% of patients were categorized as NYHA Class I, suggesting a substantial improvement in symptoms and functional status following discharge ($p$<0.001). These findings highlight the beneficial effects of close follow-up and the systematic implementation of therapeutic strategies in elderly HF patients, emphasizing lifestyle modifications, adherence to treatment, and routine medical evaluations to prevent decompensation [39].

In our study group, the KCCQ demonstrated a substantial difference between hospital admission and discharge ($p$<0.001), indicating timely and effective treatment as well as successful decongestion of patients. Research has shown that KCCQ scores can undergo significant improvement between hospital admission and discharge, highlighting the effectiveness of in-hospital treatments [51].The extent of improvement in KCCQ scores is correlated with patient outcomes. Higher KCCQ scores at discharge have been correlated with lower rates of 30-day readmission and mortality. Specifically, patients with higher KCCQ scores at discharge were observed to have a lower risk of hospital readmission within 30 days. Tracking KCCQ scores from admission to discharge offers valuable insights into patient progress and the efficacy of therapeutic interventions administered during hospitalization. Substantial improvements in these scores reflect positive treatment responses and serve as predictors of favorable short-term outcomes, including lower readmission rates **[52].**

*Conclusion:*

ADHF in elderly patients remains a significant contributor to morbidity and mortality worldwide. Evaluating outcomes with a focus on both clinical presentation and therapeutic interventions provides valuable insights for optimizing HF management in this high-risk population. Elderly patients with HF exhibited high rates of complications and in-hospital mortality, with a substantial proportion requiring readmission within six months following discharge. Elderly patients exhibit variable responses to HF pharmacotherapy and require close monitoring to ensure optimal therapeutic outcomes.The suboptimal utilization of GDMT, combined with the complexities of managing multiple comorbidities, substantially contributed to adverse long-term outcomes.

*Recommendation:*

The development of personalized care plans that take into consideration individual patient risk factors, such as comorbidities and functional status, is essential for optimizing HF management and minimizing complications. Enhancing adherence to GDMT through patient education and regimen simplification is crucial, particularly for older adults with multiple comorbidities. The integration of multidisciplinary teams, including cardiologists, geriatricians, and primary care physicians, along with the implementation of comprehensive post-discharge follow-up programs such as telemedicine and regular outpatient monitoring plays a crucial role in reducing readmissions, improving survival rates, and providing essential support to optimize long-term outcomes for HF patients.

*Study limitation:*

The relatively small sample size constrained the statistical power to detect minor differences between subgroups or identify less frequent outcomes. The follow-up period was limited to six months, which may not adequately reflect long-term trends in readmissions, mortality, or the progression of HF. The lack of N-terminal pro-B-type natriuretic peptide (N-T Pro-BNP) assessment in our study represents a limitation, as it is a recognized predictor of 30-day readmission.

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*Conflict of interest:*

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# علاج مرض فشل عضلة القلب الحاد
# ورصد نتيجته المستقبلية فى كبار السن

تتزايد نسبة السكان الذين تزيد أعمارهم عن الثمانين عاماً بسرعة. كما يتزايد متوسط العمر المتوقع فى جميع الأعمار. حيث يتراوح متوسط العمر المتوقع فعمرخمسهوستون عام ما بين ١٤,٩ الى ١٨,٩عام. بينما يتراوح متوسط العمر عند سن الثمانين ما بين ٦,٩ الى ٩,١ عام للرجال والنساء على حد سواء.

وتعد أمراض القلب والأوعية الدموية السبب الأكثر شيوعاً للوفاة بين الأشخاص الذى تزيد أعمارهم عن خمسه وستون عام، والأهم من ذلك أنها مسئولة عن معدلات مرضية كبيره مما يمثل عبء مجتمعى كبير. حيث يساهم فشل عضله القلب بشكل كبير فى زيادة معدلات الإصابة والوفيات لدى كبار السن، وهو مرض مزمن تقدمى يتم تعريفه على أنه «متلازمة سريريه معقدة يتكون من أعراض مثل ضيق التنفس وتوابعه وكذلك الإعياء العام مصحوباً بعلامات جسدية لإرتفاع ضغط الوريد الوداجى والإرتشاح الرئوى وتورم الأطراف وذلك نتيجة لوجود خلل فى بنية القلب أو وظيفته.

يعتبر ضعف عضلة القلب المزمن مرض يصيب كبار السنعلى عكس أمراض الشرايين التاجية حيث يرتفع معدل الإصابة به مع التقدم فى العمر. وتمثل نسبه الاشخاص المصابين بضعف عضله القلب البالغين اقل من خمسه وستون عام سبعه عشر نسبه مئوية فقط .

ويشكل مرضى ضعف عضله القلب كبار السن والذين يعانون من أمراض مصاحبة متعددة تحدياً مهماً لأنظمة الرعاية الصحية. ويختلف كبار السن المصابون بضعف عضله القلب عن نظرائهم الأصغر سناً حيث يعانون من معدلات أعلى من الأمراض المصاحبة، وتعدد الادويه، وضعف الإدراك والوهن، وقابلية أكبر للتعرض للآثار الجانبيه للأدوية. كما أن التجارب العشوائية الخاضعة للرقابة لهذه الفئة السكانية محدودة والمبادئ التوجيهية مستمدة من البيانات الخاصة بالمرضى الأصغر سناً. ومع ذلك فإن الحجم المتزايد لهذه الفئة السكانية يتطلب مزيداً من المعلومات حول التعامل الامثل.

كبار السن الذين يعانون من فشل حاد بالقلب أكثر عرضة للدخول والحجز بالمستشفى من المرضى الأصغر سناً ويعانون من ضيق تنفس بتصنيف سيئ طبقا لجمعية القلب فى نيويورك (NYHA) ومعدل ضربات قلب أقل وضغط دم أعلى ووظائف كلوية أسوأ.

هدفت هذه الدراسة إلى وصف المظاهر الديموغرافية والسريرية للمرضى الذين دخلوا المستشفى بسبب فشل عضله القلب.

وقد تم التركيز بشكل خاص على الأمراض المصاحبة ذات الصلة سريرياً، وتم تسجيل الأساليب التشخيصية والعلاجية المتبعة فى الممارسة الروتينية أيضاً وتقييم ومتابعه هؤلاء المرضى فى المستشفى وبعد ستة أشهر.

تم إجراء هذه الدراسة الاستعادية على ١٤٩مريضاً تتراوح أعمارهم بين ٦٦,٧٥ ± ٥,٥٢ سنة. أجريت الدراسة على مرضى من كلا الجنسين يعانون من فشل بعضله القلب.