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Original article

Clinical Outcomes in Hospitalized Patients with Decompensated Heart Failure: The Predictive Value of Precipitating Factors

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Abstract
This study assesses the clinical outcomes in hospitalized patients with Decompensated Heart Failure (DHF); the predictive value of precipitating factors. We have analyzed the factors potentially which contribute to Heart Failure (HF) in hospitalization among 125 HF hospitalized patients with DHF in Albyda medical center. New onset HF and worsening HF conditions were observed across several health hypertension, atrial fibrillation, anemia, chronic obstructive pulmonary disease, stroke renal dysfunction, arrhythmia, ischemia. Ejection Fraction showed slight declines in both new onset (35.66 ± 8.021) and worsening (35.52 ± 8.12) scenarios. Mortality rates were starkly higher in worsening cases (90.4%) compared to new onset (9.6%). Among patients with reduced ejection fraction, longer hospital stays correlated with higher mortality rate. Hypertension, history of atrial fibrillation, COPD, stroke, arrhythmia, Patient with low EF longer hospital stay high mortality rate cases.
Keywords. Clinical Outcomes, Hospitalized Patients, Decompensated Heart Failure.

Introduction

Despite remarkable pharmacological and non-pharmacological treatment advances the prevalence, and incidence of heart failure is increasing in the aging population worldwide Heart Failure (HF) still presents with elevated mortality rates [1], re hospitalization frequencies, and contributes significantly to healthcare expenditures [2-3]. While the range of agents available for chronic Heart failure management is expanding, and guideline-directed medical therapies are well-established, the same level of progress is not observed in the treatment of Acute decompensated heart failure (ADHF) [4]. This holds clinical importance as acute HF episodes and recurrent hospitalizations are linked to a poorer prognosis and the development of multiorgan failure [5]. Patients experiencing readmission due to cardiovascular diseases within 90 days post-discharge from HF-related hospitalization face an elevated risk of mortality, irrespective of the specific time from post-discharge [6].

It is widely documented that any hospitalization due to acute compensation represent an additional risk leading to adverse clinical outcomes in patient with heart failure. Various elements of exacerbations are frequently observed such as acute coronary syndrome, myocardial ischemia, tachyarrhythmia infection and renal failure [7,8]. It is considered essential to understand the prevalence of different precipitating factors, as it can guide preventive measures before hospitalization and treatment objectives during the hospital stay. Furthermore, clarifying the correlation between precipitating factors and mortality could offer insights into a subset of patients necessitating intensified management strategies while admitted to the hospital [9, 10]. This study assesses the clinical outcomes in hospitalized patients with DHF; the predictive value of precipitating factors.

Methods

A cross sectional observational study was carried out by obtaining 125 records from hospitalized patients with decompensated heart failure in the cardiology department at Albayda medical center carried out between February 2024and may 2024. We include adult patients aged 18 and above, that had been admitted to the hospital with primary diagnosis of decompensated heart failure. New onset heart failure or chronic heart failure with severe enough to require hospitalization were also included. While we exclude subjects with age of less than 18, patient with non-cardiac causes of hospitalization, and insufficient clinical data.
Baseline demographic information, medical history, clinical characteristic, precipitating factors were collected. Data were analyzed by descriptive statistics.

Results

New onset HF and worsening HF conditions were observed across several health parameters: hypertension (46.2% new onset, 57.9% worsening), atrial fibrillation (38.5% new onset, 61.5% worsening), COPD (41.0% new onset, 59.0% worsening), stroke (50.0% new onset, 50.0% worsening), uncontrolled hypertension (39.3% new onset, 60.7% worsening), renal dysfunction (29.5% new onset, 70.5% worsening), anemia (22.2%

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new onset, 77.8% worsening), ischemia (41.9% new onset, 58.1% worsening), arrhythmia (40.5% new onset, 59.5% worsening), and ACS/MI (42.5% new onset, 57.5% worsening).
Ejection Fraction (EF) showed slight declines in both new onset (35.66 ± 8.021) and worsening (35.52 ± 8.12) scenarios. Mortality rates were starkly higher in worsening cases (90.4%) compared to new onset (9.6%). Among patients with reduced ejection fraction, longer hospital stays correlated with higher prevalence of hypertension (78.9% vs. 21.1%), uncontrolled hypertension (85.7% vs. 14.3%), and renal dysfunction (81.8% vs. 18.2%) in the ≤40% group compared to the 41-49% group (P = 0.022), indicating these factors contribute to increased mortality risk in this sample population.

Table 1. Comparison according to Heart failure status

Medical history	HF status		P value
	New onset	Worsening	
Hypertension	24 (46.2%)	33 (57.9%)	1.000
History of Atrial fibrillation	15 (38.5%)	24 (61.5%)	0.698
COPD	16 (41.0%)	23 (59%)	1.000
Stroke	9 (50%)	9 (50%)	0.450
Uncontrolled hypertension	11 (39.3%)	17 (60.7%)	0.477
Renal dysfunction	13 (29.5%)	31 (70.5%)	0.057
ischemia	36 (41.9%)	50 (58.1%)	1.000
arrhythmia	15 (40.5%)	22 (59.5%)	1.000
ACS/MI	37 (42.5%)	50 (57.5%)	0.453
EF (%)	35.66±8.021	35.52±8.12	0.925
Infection	18 (36%)	32 (64%)	0.356
Anemia	6(22.2%)	21(77.8%)	0.027
Length of hospital stay	5.52±3.7	5.45±2.8	0.909
Mortality	5 (9.6%)	47 (90.4%)	0.613

COPD; Chronic Obstructive Pulmonary Disease. ACS/MI; Acute Coronary Syndrome/Myocardial Ischemia. EF; Ejection Fraction

Table 2. Comparison according to EF anemia, ischemia, arrhythmia, baseline hemoglobin, length of hospital stays, new onset, (%)

Demographic	≤40	41–49	P value
Age	63.64±12.16	59.95±10.967	0.110
Gender	61 (70.9%)	25 (29.1)	0.390
BMI	21.60±6.51	21.0±5.80	0.627
Smoking	45 (72.6%)	17 (27.4%)	0.300
Medical history			
Hypertension	45 (78.9%)	12 (21.1%v)	0.029
History of Atrial fibrillation	26 (66.7%)	13 (33.3%)	0.390
COPD	30 (76.9%)	9 (23.1%)	0.161
Stroke	14 (77.8%)	4 (22.2%)	0.303
Uncontrolled hypertension	24 (85.7%)	4 (14.3%)	0.027
Renal dysfunction	36 (81.8%)	8 (18.2%)	0.022
Anemia	21 (77.8%)	6 (22.2%)	0.212
ischemia	60 (69.8%)	26 (30.2%)	0.555
arrhythmia	25 (67.6%)	12 (32.4%)	0.453
Baseline creatinine (md/dl)	1.445±0.73	1.142±0.23	0.014
Baseline Hemoglobin (gm/dl)	11.508±2.04	12.282±2.16	0.058
Length of hospital stay	5.43±3.40	5.61±2.84	0.776
New onset	35 (67.3%)	17 (32.7%)	0.391
Worsening	49 (70.0%)	21 (30.0%)	0.533
Mortality	11 (91.7%)	1 (8.3%)	0.070

BMI; Basal Mass Index. COPD; Chronic Obstructive Pulmonary Disease.

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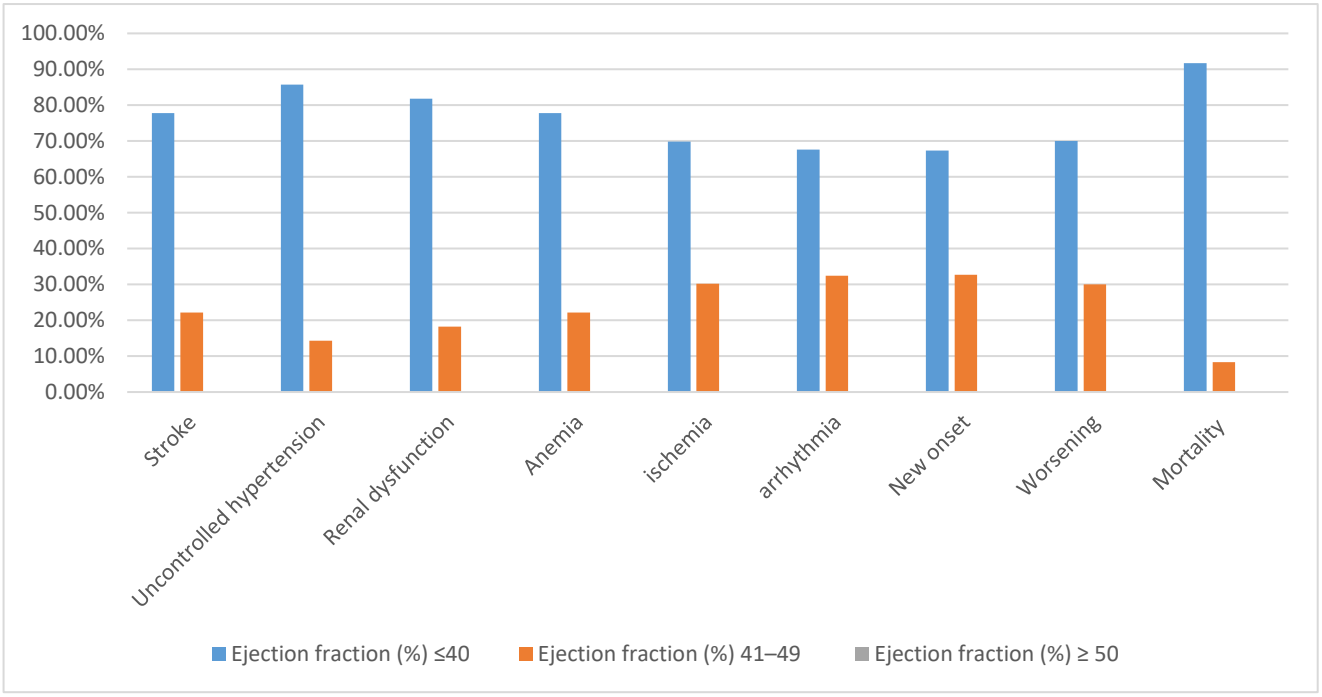

Figure 1. Comparison according to EF (%)

Discussion

This study examines the precipitins factors for acute decompensating of heart failure in Libyan population in Albayda medical center. In this study, precipitating factors are analyzed for HF hospitalization patients stratified by their HF status and ejection fraction) %. In the present study, precipitating factors include hypertension, history of atrial fibrillation, COPD, stroke, arrhythmia, ejection fraction, and length of hospital stay, BMI, smoking, diabetes, new onset, ischemic and non-ischemic conditions, acute coronary syndrome, infection, uncontrolled hypertension, renal dysfunction, anemia, and baseline lab values (creatinine and hemoglobin) are studied.

In this study, new onset and worsening conditions were observed across several health parameters: hypertension (46.2% new onset, 57.9% worsening), atrial fibrillation (38.5% new onset, 61.5% worsening), COPD (41.0% new onset, 59.0% worsening), stroke (50.0% new onset, 50.0% worsening), uncontrolled hypertension (39.3% new onset, 60.7% worsening), renal dysfunction (29.5% new onset, 70.5% worsening), anemia (22.2% new onset, 77.8% worsening), ischemia (41.9% new onset, 58.1% worsening), arrhythmia (40.5% new onset, 59.5% worsening), and ACS/MI (42.5% new onset, 57.5% worsening). EF showed slight declines in both new onset (35.66 ± 8.021) and worsening (35.52 ± 8.12) scenarios. Mortality rates were starkly higher in worsening cases (90.4%) compared to new onset (9.6%). Among patients with reduced ejection fraction, longer hospital stays correlated with higher prevalence of hypertension (78.9% vs. 21.1%), uncontrolled hypertension (85.7% vs. 14.3%), and renal dysfunction (81.8% vs. 18.2%) in the ≤40% group compared to the 41-49% group (P = 0.022), indicating these factors contribute to increased mortality risk in this population. In this study heart failure "cases were" divided into three groups in this study according to ejection fraction: They are heart failure preserved EF >50%, heart failure with reduced EF<40%, heart failure with mildly reduction (41-49%).

Hypertension was more prevalent in the ≤40% group compared to the 41–49% group. Atrial fibrillation showed similar prevalence in both groups. Chronic obstructive pulmonary disease (COPD) was slightly more prevalent in the ≤40% group than in the 41– 49% group, while stroke prevalence was similar between the groups. Uncontrolled hypertension was more common in the ≤40% group. Renal dysfunction was also higher in the ≤40% group compared to the 41– 49% group. Anemia had similar prevalence in both groups without significant difference. Ischemia and arrhythmia showed similar prevalence in both groups. Baseline creatinine levels were significantly higher in the ≤40% group, whereas baseline hemoglobin levels were lower. Length of hospital stay did not differ significantly between the two groups. New onset and worsening heart failure had similar prevalence in both groups. Mortality was higher in the EF ≤40% group compared to the EF 41–49% group.

Another study involving 101 individuals from low socioeconomic status revealed that noncompliance with a low sodium diet non adherence to medication (64%) uncontrolled HTN (44%) and cardiac arrhythmia (29%) were the primary precipitating factors of heart failure [11]. Another study with 328 heart failure hospitalization cases identified arrhythmia (24%), infections (23%), poor adherence to treatment (15%), and angina (14%) as primary precipitating factors [12]. Also a study in Germany study involved 179 patients

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identified dietary sodium excess (43%), non adherence to medication (24%), ischemia (13%), and uncontrolled hypertension (8%), as prominent precipitating factors [13].

Conclusion

Hypertension, history of atrial fibrillation, COPD, stroke, arrhythmia, ejection fraction, and length of hospital stay stand out as appear to be the significant predictors of clinical outcomes. Effectively managing these factors necessitates a multidisciplinary approach that integrates lifestyle modifications and pharmacological treatments.

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Conflicts of Interest

No conflicts of interest.

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المستخلص

تقيم هذه الدراسة النتائج السريرية لدى المرضى المقيمين في المستشفى المصابين بقصور القلب غير المعوض؛ والقيمة التنبؤية للعوامل المسببة. لقد قمنا بتحليل العوامل التي قد تساهم في قصور القلب في المستشفى بين 125 مريضًا مصابًا بقصور القلب غير المعوض في المستشفى في مركز البيضاء الطبي. لوحظت حالات قصور القلب الجديدة وتفاقم حالات قصور القلب في العديد من الحالات الصحية مثل ارتفاع ضغط الدم والرجفان الأذيني وفقر الدم ومرض الانسداد الرئوي المزمن والسكتة الدماغية واختلال وظائف الكلى وعدم انتظام ضربات القلب ونقص التروية. أظهرت نسبة القذف انخفاضًا طفيفًا في كل من سيناريوهات البداية الجديدة (35.66 ± 8.021) والتفاقم (35.52 ± 8.12). كانت معدلات الوفيات أعلى بشكل صارخ في الحالات المتفاقمة (90.4٪) مقارنة بالبداية الجديدة (9.6٪). بين المرضى الذين يعانون من انخفاض نسبة القذف، ارتبطت فترات الإقامة الطويلة في المستشفى بارتفاع معدل الوفيات. ارتفاع ضغط الدم، تاريخ من الرجفان الأذيني، مرض الانسداد الرئوي المزمن، السكتة الدماغية، عدم انتظام ضربات القلب، مريض لديه انخفاض كسر القذف ومدة إقامة أطول في المستشفى ومعدل وفيات مرتفع.

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