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ORIGINAL ARTICLE

To Access the Clinical Outcomes at Three Months amongst Patients Presenting with Acute De-Compensated Heart Failure

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ABSTRACT

Aim: To determine the 3-month clinical outcome in patients with acute decompensated heart failure (ADHF).

Study Design: A cross-sectional descriptive study.

Place and Duration: This study was conducted at Cardiology department of Liaquat University of Medical and Health Sciences Jamshoro for six-months duration from July 2021 to December 2021.

Methodology: Patients with acute de-compensated heart failure (ADHF) were involved and followed for the consequences in the form of worsening functional class, re-admission and mortality. The exercise test was performed according to the modified Bruce protocol on treadmill, with incessant on-line respiratory gas. The slope of the association between CO2 production (VCO) ventilation (VE) was evaluated by computer graphical analysis (VE / VCO2 slope).

Results: 79(54.1%) of 146 patients were male. Patients' age ranged from 15 to 85 years, and the mean age was 52.10 ± 19.54 years. The patients were alienated into four age groups. Overall, 94(64.4%) of patients showed adverse clinical outcomes at three months of follow-up. Overall readmission rates were 16.7% higher in patients 51-70 years of age. Deterioration in the functional class occurred in 32.9%, less frequently in 14.6% of patients in 71-85 years of age. Mortality was found in 16.4% of patients and 37.5% of patients aged 71-90 years in the three-month follow-up.

Conclusions: During the three-month follow-up period, readmissions for acute decompensated heart failure were significantly higher at a younger age, while functional class deterioration and mortality were higher at an older age.

Keywords: Rehospitalization, Acute decompensated heart failure, Mortality and Functional class.

INTRODUCTION

Heart failure (HF) is a condition that results from the inability to pump the right amount of blood throughout the body and can arise from any structural or functional heart defect that causes the symptoms of HF[1-2]. ADHF is a rapid inception or alteration in the signs and symptoms of HF that requires urgent treatment. The causes of the heart failure symptoms are not completely understood[3]. Obstruction symptoms may be related to increased left or right ventricular filling pressure. Pulmonary and systemic obstruction from increased right and left heart filling pressures is an almost common symptom of ADHF[4]. Increased pressure in pulmonary capillaries with symptoms of fluid overload is responsible for pulmonary edema and dyspnoea in acute heart failure. About half of hospitalized heart failure patients have moderate to severe reduced ejection fraction (LVEF) < 40% and left ventricular systolic function (LVF)[5-6]. HFPEF is more common in older adults, women, and 3 people with high blood pressure or diabetes. More recent studies have shown that the prognosis is broadly similar to that of systolic HF[7]. The prevalence of HF is 2-3% and increases with age. At the beginning of the eighth decade, it rises sharply. The incidence is 10-20% in the age of 70-80 years. In younger age groups, HF is communal in males because coronary artery disease, the utmost communal source, transpires in earlier decades[8-9]. ADHF is one of the most common syndromes in cardiology, associated with a shorter life expectancy, frequent and long hospitalizations, and high healthcare costs[10]. ADHF accounts for 5% of emergency hospital admissions, 10% of hospital bed occupancy and about 2% of national health expenditure. It is the communal reason of cardiovascular hospitalization in the USA, with an average extent of stay of 3 to 4 days[11]. Patients with ADHF are 3.5 times more likely to die, spend six times as many days in hospital, and face four times more healthcare costs than patients of the same age and sex[12]. One-third of these patients are re-admitted to hospital within 90 days for recurrent decompensation. The purpose of this study is to find out about the three-month treatment outcome in ADHF patients. This study will provide local data on the short-term outcomes of ADHF patients. This will help to plan strategies to further improve care and outcomes for such patients.

METHODOLOGY

This descriptive cross-sectional study was conducted at Cardiology department of Liaquat University of Medical and Health Sciences Jamshoro for six-months duration from July 2021 to December 2021. The sample size was 146 with a 10% readmission rate for ADHF patients, with a 95% confidence level and a 5% margin of error using the sample with WHO sample size software. The hospital's ethics committee approved the study. The informed consent in written form was taken from all subjects explaining the purpose and benefits of the study. Eligible for registration were patients of all ages and both genders admitted to the department of Cardiology. ADHF was defined as dyspnoea at rest and met any of the following four criteria: increased pressure in the jugular veins (greater than 5 cm from the sternum angle with the patient lying at a 45-degree angle), peripheral edema (edema with the appearance of an ankle patting with thumb pressure for 5 seconds), enlargement of the liver (felt 2 cm below the right costal edge of the liver), ascites (fluid in the peritoneal cavity, confirmed by dementia), rales (sounds of Crackling in the lower chest with a stethoscope), S3 gallop (early diastolic heart sound detected with a stethoscope). Functional class degradation has been defined as the transformation of a functional class into a severe form. Defined as a class; Class I: Dyspnoea when walking on smooth surfaces for more than six or six minutes. Class II: Dyspnoea when walking for more than three and less than six minutes on level ground. Class III: Dyspnoea when walking on level ground for less than three or three minutes. Class IV: Dyspnoea at rest. Readmission was defined as readmission due to ADHF within three months of discharge. Mortality was defined as death from any cause within three months of discharge from hospital. Patients admitted to the outpatient clinic or the emergency department were enrolled in the study by matching samples without any probability. Strict exclusion criteria were followed to check for misleading and biased research results. Patients with acute left ventricular failure, chronic renal failure, chronic liver disease and chronic obstructive pulmonary disease were omitted from the analysis. A detailed history of the patient was prepared. A complete physical examination including a general physical examination and a systemic examination was performed. Relevant studies have been performed, including

electrocardiography and echocardiography. All patients were treated according to the ACC / AHA guidelines for heart failure. After stabilizing and recovering in the NYHA class, patients were discharged on standard medications and followed at monthly intervals for up to three months through follow-up visits and telephone calls. Score was measured in terms of re-admission, functional deterioration after discharge, and death. All information was saved in a previously designed form. The collected data was stored and analyzed using SPSS version 21.0. The mean ± SD was calculated for numerical variables such as age. The percentages and frequencies were calculated for categorical variables such as gender, readmission, functional class deterioration, and death.

RESULTS

146 total ADHF patients were registered in the study. No patient was lost during follow-up. Of these, 79(54.1%) are men and 67 (45.9%) are women. Patients' age ranged from 15 to 85 years, and the mean age was 52.10 ± 19.54 years. The patients were alienated into four age groups: group A 15-30 years old, group B 31-50, group C 51-70 and group D 71-85. The number of patients in each group was as follows: Group A = 30(20.5%), Group B = 33 (22.6%), Group C = 49 (33.6%), Group D = 34 (23.2%).

Table 1: Baseline Features Of The Patients

Variables	Number (%age)
Gender	
Male	79(54.1%)
Female	67 (45.9%)
Mean Age	52.10 ± 19.54 years
Group A(13-30)	30(20.5)
Group B(31-50)	33(22.6)
Group C(51-70)	49(33.6)
Group D(71-85)	34 (23.2)
Coronary Artery Disease	78(53.4)
Rheumatic Heart Disease	31(21.2)
Cardiomyopathy	26(17.8)
Atrial Fibrillation	11(7.5)

The indicator of functional class deterioration depending on age was 29.2% in group A, 31.3% in group B, 25% in group C and 14.6% in group D. The three-month mortality in the study population was 16.4%. Mortality increased with age. It was 12.5%, 20.8%, 29.2% and 37.5%, respectively, in the A, B, C and D age groups.

Table 2: Three months clinical outcomes in patients with ADHF

Category	Overall n=146 (%age)	Age Group A n(%age)	Age Group B n(%age)	Age Group C n(%age)	Age Group D n(%age)
Worsening Class	48 (32.9)	14(29.2)	15(31.3)	12(25)	7(14.6)
Re-admission	30 (20.5)	12(40)	10(33.3)	5(16.7)	3(10)
Death	24(16.4)	3(12.5)	5(20.8)	7(29.2)	9(37.5)
Composite of		21(22.3)	25(26.6)	28(29.8)	20(21.3)
adverse clinical outcomes	94(64.4)				

Overall, 94(64.4%) of patients showed adverse clinical outcomes at three months of follow-up. Overall readmission rates were 16.7% higher in patients 51-70 years of age. Deterioration in the functional class occurred in 32.9%, less frequently in 14.6% of patients in 71-85 years of age. Mortality was found in 16.4% of patients and 37.5% of patients aged 71-90 years in the three-month follow-up.

DISCUSSION

Our study found a poorer short-term clinical outcome in ADHF patients. Although the results were not statistically significant, the adverse clinical outcome was higher in male patients[13]. Our findings are similar to those presented in previous studies. Mauro Feola followed ADHF patients for fourteen months and showed adverse clinical outcomes in 14.3% of patients[14]. Likewise, colleagues at Vaartjeet had a higher incidence of adverse clinical outcomes in their study, especially in male patients. In the SOLVD study, a higher survival rate was seen in men than in women. The mean age of ADHF in our patients was lesser than that described in the international literature[15]. Laura Venskutonyte reported in her study that the mean age was 67.15 ± 12.5 years. Similarly, a mean of 71.5 ± 12.4 years was found in the study by Spinar et al. However, in a local study, the mean age of patients with heart failure was 48.5, which was similar to our results. It is clear in our system that ADHF patients appear at a younger age than the Western population[16]. Higher readmission rates were observed in women and in the younger age group. In the study by Ko et al., The 90-day rate of repeated hospitalizations in patients with HF was 14.1%. Similarly, M.S. Nieminen et al. Showed a 20% readmission rate in AHF patients with HF after 3 months of follow-up, with similar results in both sexes. In contrast, Mauro Feola showed a 7.6% readmission rate after a 14-month follow-up of patients with HF. The reason for the high rate of readmission in the young population is the high incidence of rheumatic heart disease in young patients. One third of our patients had worsening heart failure. Worsening of heart failure was common in NYHA Class III and Class II patients at discharge[17-18]. In Ali Ahmed, the incidence of functional class declines in NYHA Class I, II, III, and IV patients was 14.2%, 17.1%, 32.5%, and 33.3%, respectively[19-20]. These results can be compared with our study. As observed in 15% of our patients, the short-term mortality of ADHF is higher[21-22]. In our observation, death occurred mainly in the group of elderly people. This is due to the increased incidence of coronary artery disease and NYHA class IV in this age group. Our observation is supported by Velavan P et al., Whose study showed a 13% mortality due to ADHF over a three-month follow-up[23]. However, Laura Venskutonyte reported a 37.5% mortality in three months, and V.P. In these patients, Harjola et al[24]. The death rate of 8.1% was significantly lower than in our study.

CONCLUSION

While re-admission of patients with acute decompensated heart failure was significantly higher at a younger age, functional class deterioration and mortality were higher at an older age at 3 months of follow-up.

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