ORIGINAL ARTICLE
NONCOMPLIANCE TO TREATMENT AND COMMON PRECIPITATING FACTORS IN STAGE C HEART FAILURE

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Objectives: The objective of this study was to determine the frequency of non-compliance to treatment and common precipitating factors in stage C heart failure (HF) patients at a tertiary care cardiac hospital of Karachi, Pakistan.

Methodology: This descriptive cross-sectional study was conducted at a tertiary care cardiac center of Karachi, Pakistan. Required number of consecutive patients of either gender between 18 to 75 years of age who were diagnosed with stage C HF were included in this study. Data for the study were collected on a pre-defined proforma consisted of demographic characteristics (gender, age), clinical factors, and precipitants of decompensation of HF (duration of disease, non-compliance to the treatment, infection, arrhythmias, uncontrolled hypertension, and anemia).

Results: A total of 114 patients with stage C HF were included. Mean age was 56.7 ± 9.9 years with 34.2% (39) patients above 60 years of age. Male patients were 51.8% (59) of the total sample and median duration of disease was 36 [20 to 60] months. Non-compliance to the HF treatment was observed in 48.2% (55), while among other precipitants, infection was observed in 21.9% (25), arrhythmias in 20.2% (23), uncontrolled hypertension in 13.2% (15), and anemia in 18.4% (21).

Conclusion: A significant proportion of stage C HF patients were found to be non-adherent to the prescribed treatment. The most commonly observed triggering factor was infection followed by arrhythmias. Routine practice must include an ongoing assessment of compliance to the treatment and lifestyle modifications among HF patients for the proper counseling of non-complying individuals.

Keywords: heart failure, non-compliance, precipitants, decompensation, Pakistan

INTRODUCTION

Approximately up to two percent of the population is effected by heart failure (HF) which is a chronic long lasting condition.[1] Among multiple factors, therapeutic advancement and elderly population are the two crucial elements responsible for increased prevalence of the disease.[1] The increasing burden of diseases has both clinical and economical implications such as increasing demand of health facilities and higher morbidity and mortality rates.[3] Its epidemiological diversity, complex clinical manifestations, and significant influence on quality of life of affected individuals combined pose a challenges for health systems, especially in low- and middle income countries. Additionally, considering the financial implications of the diseases on resource limited healthcare systems, it is considered to be one of the global economic and organizational issues.[4] The development of heart failure consists of recurring events of decompensation that usually needed hospitalization,[5] resulting in increased healthcare expenses due to this disease.[1, 3] There are various factors that can give rise to the risk of an event of HF decompensation, among which the most prevalent are non-compliance to the dietary restrictions, respiratory infection, non-compliance in treatment, cardiac arrhythmias, and hypertension. Around 2/3rd of these factors are preventable and prompt recognition could lead to improved disease management and reduction in the financial burden.[6] It is estimated with an individual with HF usually visit their health care facilities on an average of over 25 times in a year due to decompensation of HF.[1]

Medicine compliance is a crucial part of HF disease management, the importance of adherence to the pharmacological therapies should be emphasized at the time of discharge as well as on continuous basis during outpatient follow-up.[7] Non-compliance of suggested medication results in development of disease that often leads to hospitalization due to deteriorating symptoms or even early mortality. Noncompliance of drugs is a key issue not only in managing HF patients but also in the management of other non-communicable diseases too.[8] In order to make treatment successful, adherence with medication is an essential indicator, noncompliance is of grave concern for the individual as well as the healthcare system.[9] For example, around 125,000 avoidable deaths occur worldwide due to non-compliance to medication.[10] Adherence to medication is of particular importance in managing cardiovascular diseases. The likelihood of mortality increases three times for the individuals with acute coronary syndrome that do not comply with the treatment compared to those who follow medication properly. Improper adherence to the HF treatment not only associated with increased number of visits to the emergency department but also to the higher risk of mortality, morbidity, and poor quality of life.[11] An optimum medical efficiency requires 80% of compliance rate with the prescribed medications. However, compliance rate of 50% has been observed among patients with chronic illnesses and lack of knowledge, poor health-care services, poor access to medication, and poor knowledge of disease are the few among determinants of non-compliance.[12]

Hence, adherence to the medication, along with the lifestyle modifications as per recommendations are the key detrimental factors for the success of heart failure management therapies. An understanding barriers to the adherence of non-pharmacological and pharmacological recommendations for HF patients is important to enhance the efficiency treatment plan. Therefore, aim of this study was to determine the frequency of non-compliance to treatment and common precipitating factors in stage C HF patients at a tertiary care cardiac hospital of Karachi, Pakistan.

METHODOLOGY

This descriptive cross-sectional study was conducted at a tertiary care cardiac center of Karachi, Pakistan. This study was conducted for the dissertation and thesis research work for FCPS (cardiology) from the College of Physicians and Surgeons Pakistan (CPSP). Study was approved by the CPSP and it was conducted at the National Institute of Cardiovascular Diseases (NICVD), Karachi, Pakistan between June and December 2017. Required number of consecutive patients of either gender between 18 to 75 years of age who were diagnosed with stage C HF were included in this study. New onset cases of HF or patients diagnosed with HF within past six months, Patients with psychiatric illness like depression and schizophrenia, and patients with cor pulmonale and pericardial temponade were excluded from the study. Verbal consent was obtained from all the participants of the study. Stage C HF was defined as patients with pre-existing HF who were presented with worsening of HF symptoms such as edema (swollen abdomen, lower legs, ankles, or feet), fatigue (week legs or feeling tired), or shortness of breath.

Data for the study were collected on a pre-defined proforma consisted of demographic characteristics (gender, age), clinical factors, and precipitants of decompensation of HF such as duration of disease, non-compliance to the treatment, infection (fever ≥101°F for last 48 hours and TLC >11,000 cells/cumm), arrhythmias (based on ECG on the arrival at the emergency department), uncontrolled hypertension (≥140/90mmHg for at least one week), and anemia (hemoglobin level less than 10mg/dl). Non-compliance was defined based on counting of unused pills, a pill usage of ≤ 80% per week was taken as non-compliance.

Collected data were entered and analyzed using Microsoft (MS) Excel 2013 and IBM SPSS version 19. Descriptive summary of the data were obtained as frequency distribution or mean ± standard deviation (SD) or median [interquartile range (IQR)]. The distribution of non-compliance rate and other precipitants of decompensation of HF were compared between male and female gender, between old and young age groups, and by duration of disease with the help of Chi-square test with a significance criteria of p-value≤0.05.

RESULTS

A total of 114 patients with stage C HF were included. Mean age was 56.7 ± 9.9 years with 34.2% (39) patients above 60 years of age. Male patients were 51.8% (59) of the total sample and median duration of disease was 36 [20 to 60] months.

Non-compliance to the HF treatment was observed in 48.2% (55), while among other precipitants, infection was observed in 21.9% (25), arrhythmias in 20.2% (23), uncontrolled hypertension in 13.2% (15), and anemia in 18.4% (21).

The incidence of uncontrolled hypertension was significantly higher among female patients as

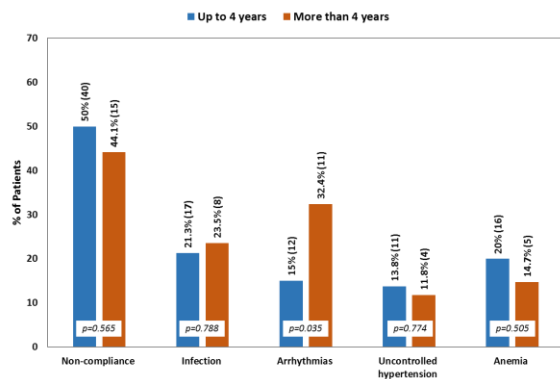compared to male (20% vs. 6.8%; p=0.037), as shown in Figure 1.
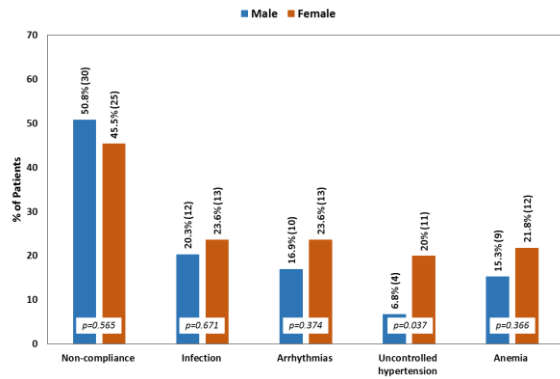
Figure 1: Distribution of precipitants of decompensation of heart failure by gender

Distribution of precipitants of decompensation of heart failure by age is presented in Figure 2. No significant association between age and incidence of precipitants was observed.
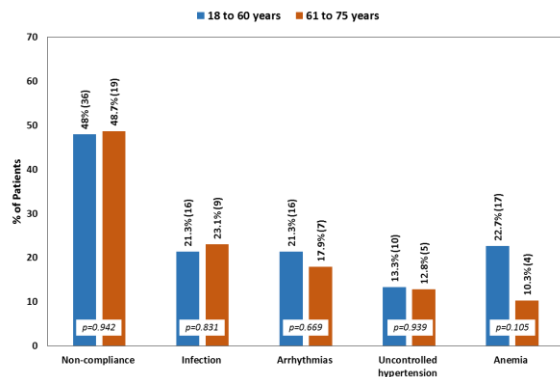
Figure 2: Distribution of precipitants of decompensation of heart failure by age

Figure 3: Distribution of precipitants of decompensation of heart failure by duration of disease

The incidence of arrhythmias was significantly higher among patients with disease duration of more than 4 years as compared to the patients with disease duration of up to 4 years (32.4% vs. 15%; p=0.035), as shown in Figure 3.

DISCUSSION

A systematic congestion triggered by various factors can span over duration of several hour to days before acute HF episode. Such congestions can be caused directly by fluid redistribution or accumulation due to stimulation of pathophysiological mechanisms or by indirect means through deteriorating of cardiac systolic or diastolic function. Understanding of pathophysiological mechanisms in the progression of acute HF is important for optimal efficacy of the treatment plan. However in some cases, a continuous growth in body mass and pulmonic pressure is witnessed days before hospitalization, while there is a slight increase of weight in relevant proportions of individuals having acute HF.[13] The prevalence of various precipitants in individuals having acute HF has been examined by various registries that include Euro Asian registry of GREAT network and North American OPTIMIZE HF registry.[14] These precipitants include acute coronary syndrome (ACS), arrhythmias, infections (airway infection), hypertension (uncontrolled), and non-adherence with diet and medicine recommendations have been seen as major prevalent among many.[14] Importantly, no precipitants were found in a significant number of individuals around 40 to 50%, though a bend of various precipitants were seen in 5 to 20% of individuals.[14] In our study, 48.2% were found to be non-adherent to the treatment of HF, while among other triggering factors, 21.9% had infection, 20.2% were with arrhythmias, uncontrolled hypertension was observed in 13.2%, and 18.4% were anemic. Uncontrolled hypertension was significantly higher in female patients and the incidence of arrhythmias was found to be more common among patients with longer duration of disease (i.e. more than 4 years).

Various studies have revealed that identification of precipitants gives predictive insights as various precipitants are found to have strong association with unplanned hospitalization, morbidity, and mortality rates.[14, 15] Such as, acute HF caused by ACS or infection carries higher short-term deaths as compared to the acute HF caused by arrhythmias (atrial fibrillations) or hypertension (uncontrolled).[14] It is noteworthy that acute HF triggered by either infection or ACS have same projection of unfavorable prognoses, but risk of death is time dependent in both the groups. In patients with acute HF triggered by ACS, risk of mortality is high during initial days of

hospitalization, while, mortality peaks at 3rd week among patients with acute HF triggered by infections.[14, 16] This phenomena can be speculated due to complex interactions of infections with endothelial dysfunctions, activated coagulations, fluid retaining, ischaemic myocardial injury, arrhythmia and danger of related advancing non-cardiac diseases can cause mortality.[14] Lastly and most notably, the recognition of factors allows the provision of particular treatment guided towards the basic pathology of acute HF, apart from decongestive therapy.

The outcomes of this paper are in accordance with a cross sectional study carried out at the Mazandaran Heart Center in Iran to assess the factors associated with medicine compliance in individuals having HF. In a study of 300 individuals admitted for HF, it was revealed that education had a greater impact in terms of adherence; although, age, gender, occupation, location, earnings and number of hospitalizations were not statistically significant.[17] Aspiration of being healthy was the key motivator for medicine compliance in individuals. Individuals aware of their illness and symptoms described that the recommended prescription facilitated them in relieving those symptoms.[18] Another important factor to boost up the compliance was the patients' terms and relationship with the healthcare personnel and family members.[19] It is noteworthy that in elderly individuals, aloneness and social support had an adverse impact on compliance when stating socio demographic aspects. It has been observed that the provision of social support by the families of the patients and healthcare providers among HF patients has a positive impact on compliance.[20] The families of the patients usually help in evolving the habit of medicine intake along with helping in follow up visits and tests.[20, 21] The most prevalent cause of poor compliance in elderly individuals is forgetfulness that has been considered as a critical hurdle in medicine compliance.[21, 22]

There could be various reasons of non-compliance such as insufficient knowledge, lack of clear instructions and recommendations from healthcare personnel, and improper out of hospital healthcare facilities in a certain set of patients. Forgetfulness is another important factor causing non-compliance in patients. Most patients forget to follow the prescription, for example, they miss one dose in a day or even they miss doses for the full day, such behavior was observed in individuals of all ages.[19] A cross-sectional study revealed that forgetfulness, lack of knowledge on what step should be taken when a dose is missed, and a hesitant behaviour towards medication were some of the elements contributing to non-adherence with cardiovascular medication.[23]

Various authors have also reported non-adherence with low sodium dietary restrictions. A research conducted by Riegel et al. showed low scoring of patients regarding low-salt intake, and it was considered to be due to misconception and misinterpretation of the recommended diet restrictions.[24] Most individuals following a dietary prescription do not take into consideration the amount of sodium in the products they use.

Although, this is a small single center study with a limited sample size, but it provides significant insights into the gravity of problem in our population.

CONCLUSION

In conclusion, a significant proportion of stage C HF patients were found to be non-adherent to the prescribed treatment. The most commonly observed precipitant of HF decompensation was infection followed by arrhythmias. Routine practice must include an ongoing assessment of compliance to the treatment and lifestyle modifications among HF patients for the proper counseling of non-complying individuals. Individuals must be aware of the nature of their disease and significance of adherence with medication. Counseling should be provided to patients on every visit regarding the sensitivity of disease and significance of compliance with medication. It is a responsibility of healthcare professional to identify and address the patients' behaviors that may affect the compliance to the pharmacological and non-pharmacological recommendations for HF patients. Additionally, health experts must formulate potentially feasible techniques to increase compliance in their regular practice.

AUTHORS' CONTRIBUTION

BAS, JAS, RK, GA, MHB, JKS, AN, and MAB: Concept and design, data acquisition, interpretation, drafting, final approval, and agree to be accountable for all aspects of the work. TS, and NQ: Data acquisition, interpretation, drafting, final approval and agree to be accountable for all aspects of the work.

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