Original Article

Clinical Features and Incidence of Heart Failure among Patients with Preserved Ejection Fraction

Heart Failure with Ejection Fraction

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ABSTRACT

Objective: To evaluate the clinical characteristics and incidence of HFpEF cohort in Pakistan as inadequate information is accessible regarding this enormously heterogeneous syndrome.

Study Design: A cross-sectional study

Place and Duration of Study: This study was conducted at the Cardiology Department of Chaudhary Pervaiz Elahi Institute of Cardiology, Multan, Pakistan for one-year duration from May 2020 to May 2021.

Materials and Methods: 108 patients with heart failure were registered in the analsyis to calculate the prevalence of HFpEF. Clinical presentation and Comorbidities among 25 patients for HFpEF were evaluated. Rendering to the guidelines of European Society of Cardiology (ESC) Guidelines: HFpEF was diagnosed among patients. There were 68 males and 40 females.

Results: Among 25 (23.1%) patients: HFpEF was analyzed (CI 95%, 15.3%-30.4%, respectively). 64.0 years was the mean age of the subjects. The patients of 60 to 79 years of age were the most common affected age group. Most of the individuals (63%) were men. Many individuals had a wide range of risk factors and comorbidities. The greatest communal risk factor was hypertension among 76% of the patients. There were 64% of dyslipidemia and 52% of diabetes cases. Coronary artery disease was among 32% of cases. 28% of cases had CKD. The atrial fibrillation was observed among 24% of patients, from which arrhythmia was most common. 64.3% have increased weight ratio with obesity. It was institute that 52% had anemia. NYHA IV in decompensated stage was noticed in 74.10% of patients. The most common complaint (100%) was dyspnea, and the most common sign was the bilateral lung base crepitations (92%).

Conclusion: The results of the studies revealed the description of HFPEF among the Pakistani population, but further epidemiologic trainings are required.

Key Words: clinical presentation, comorbidities, HFpEF

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INTRODUCTION

Heart failure (HF) is an escalating epidemic with high frequency and prevalence that is the leading cause of the morbidity, mortality and impairment of quality of life[1-2]. In 2014, there were almost 2.6 billion persons worldwide with heart failure[3-4]. Although, no information is accessible on the prevalence and incidence of heart failure in Pakistan, but life expectancy has augmented in Pakistan, lifestyle changes have occurred, and there may be increasing stress in treating heart disorders such as MI, valvular disease and arrhythmias subsidizing to the growing load of heart failure in Pakistan.

In current era, HFpEF has been progressively documented as a multifaceted pathophysiological entity[5-6]. In a previous study, the pervasiveness of HFpEFin in the Europe and USA increased from 39% to 55% of altogether cases of heart failure[7-8]. The prevalence of HFpEF is increasing by 1% compared to HFrEF, as suggested by the latest data from this year[9]. In Japanese Cardiac Registry of Heart Failure in Cardiology, the incidence of HFpEF was 26%1[10-11]. HFpEF occurs in elderly patients, especially women, with small heart with atrophy and a high incidence of diabetes, atrial fibrillation and hypertension but evidence suggests that HFpEF individuals have diverse levels of related comorbidities. The prevalence of HFpEF and patient characteristics may vary geographically. Therefore, we wanted to calculate the

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incidence of HFpEF patients in our community and evaluate their clinical characteristics.

MATERIALS AND METHODS

This cross-sectional study was held in patients from the Cardiology Department of Chaudhary Pervaiz Elahi Institute of Cardiology, Multan, Pakistan for one-year duration from May 2020 to May 2021. 124 patients with heart failure participated in the study. Rendering to the guidelines of European Society of Cardiology (ESC) Guidelines: HFpEF was diagnosed among patients. Acute coronary syndrome, Acute myocardial infarction, congenital heart disease, severe valvular heart disease, pacemakers and prosthetic valves and individuals with poor echo window were rejected.

Methodology: The criteria of selection were documented within 72 hours of hospitalization. Selected subjects were informed about the research purpose, demographic statistics were documented and written consent was obtained.

Based on the ECG findings, three categories of the patients were made: HFrEF, HFmrEF, and HFpEF. The percentage and frequency of HFpEF were analyzed.

The clinical data, cardiovascular risk factors, related disorders and detailed clinical history was taken. Patients' symptoms were classified conferring to the classification of NYHA. An appropriate general physical evaluation was performed.

Data was collected from important laboratory tests such as ECG, Doppler echocardiography and chest radiography. In significant cases, blood samples were approved on day 1 for BNP testing for relevant patients.

Statistical analysis: All analyzes were accomplished using the Microsoft Office 2011 in EXCEL data sheet. Continuous variables were accessible as mean ± standard deviation (SD). Categorical variables are documented as percentages and counts.

RESULTS

Among 25 (23.1%) patients: HFpEF was analyzed (CI 95%, 15.3%-30.4%, respectively). 64.0 years was the mean age of the subjects. The patients of 60 to 79 years of age were the most common affected age group. Most of the individuals (63%) were men. Many individuals had a wide range of risk factors and comorbidities. The greatest communal risk factor was hypertension among 76% of the patients. There were 64% of dyslipidemia and 52% of diabetes cases. coronary artery disease was among 32% of cases. 28% of cases had CKD. The atrial fibrillation was observed among 24% of patients, from which arrhythmia was most common. 64.3% have increased weight ratio with obesity. It was institute that 52% had anemia. NYHA IV in decompensated stage was noticed in 74.10% of patients. Figure 1 shows the population BMI distribution.

6 (24%) smoked cigarettes and ischemic stroke was noticed in 1 (4%) of cases. Table II lists the main comorbidities.

Table No.1: Shows the incidence of patients with HFpEF

HF subtype	Frequency	Percentage	95% CI
HFpEF	25	23.1	15.3 –30.4

Table No.2: Shows the different co-morbidities among patients

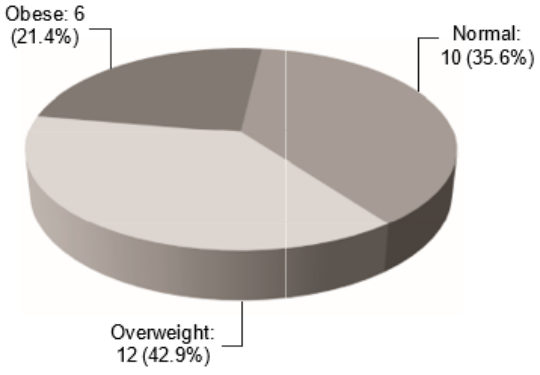
Comorbidities & risk factors	n (%)
Dyslipidemia	16 (64)
Hypertension	19 (76)
CAD	8 (32)
DM	13 (52)
Atrial fibrillation	6 (24)
CKD	7 (28)
Stroke	1 (4)
Smoker	6 (24)

The most common complaint (100%) was dyspnea, and the most common sign was the bilateral lung base crepitations (92%). (Fig. 2). The fatigue was found in 20 patients (80%) and palpitations among 12 (48%).

21 cases (84%) have tachypnea, and 16 cases (64%) were found with high systolic blood pressure. The table-3 shows the usual signs of the study group.

Table No.3: Shows the findings of Physical examination among studied population

Examination findings	Result
Respiratory rate, mean (SD), range	17.86 (4.2), 14-28
Pulse b/m, mean (SD), range	90.03 (13.2), 75-115
DBP mmHg, mean (SD), range	89.0 (14.5), 65-115
SBP mmHg, mean (SD), range	149.33 (18.8), 115-175
Leg oedema, n (%)	8 (32)
Anemia, n (%)	13 (52)
Bilateral basal creps, n (%)	23 (92)
Raised JVP, n (%)	2 (8)



n = number of study population

Figure No.1: Pie diagram showing the distribution of BMI

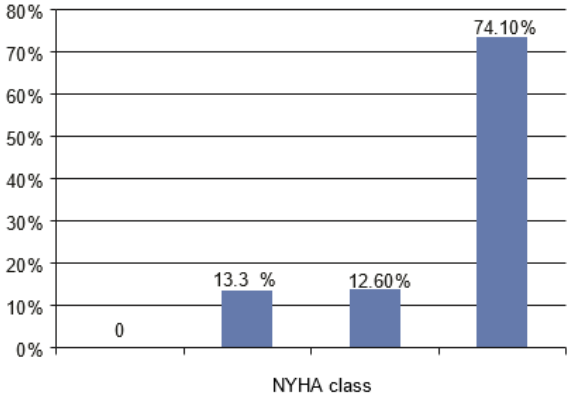


Figure No.2: Presentation of study population according to NYHA class (n = 25)

DISCUSSION

The characteristics and frequency of HFpEF patients changed significantly because of the consistency of diagnostic criteria and the heterogeneity of the syndrome itself. As far as we know, conferring to the 2016 European Society of Cardiology (ESC) Heart Failure; this is the first study to use the diagnostic criteria for HFpEF in Pakistan[12-13].

In this study, the incidence of HFpEF was 25 (23.1%), which is nearly comparable to the results of cardiology in the Japanese Cardiac Registry (JCARE-CARD) where the incidence of HFpEF was 26%. In the US and Europe, HFpEF accounted for 39% to 55% of all cases of heart failure in previous studies as well as in recent large studies. The Organized Program and database of Decompensated Heart Failure National Registry (ADHERE) to start Treatment for Live saving modalities in admitted patients with HF, the incidence of HFpEF was 51.1% and 52.5%, respectively; however, equally of these records had a lesser ejection fraction (≥ 40%) as in criteria of inclusion[14-15]. Differences in the incidence of HFpEF may be more stringent inclusion criteria for this study compared to previous studies, and there may also be absence of knowledge of HFpEF amongst reference physicians[16]. 64.0 years was the mean age of the subjects. These subjects were young than OPTIMIZE-HF registry 75.6 (13.1) mean (SD) age and ADHERE 73.9 (13.2) mean (SD) age[17-18].

Mostly of the subjects (64.3%) have increased weight with obesity, with Preserved Cardiac Function; Treatment of Heart Failure by Aldosterone Antagonist as in TOPCAT study[19-20]. Most patients with HFpEF had different comorbidities in our analysis. In 76% of patients have hypertension which is a communal risk factor. Earlier research has found that hypertension ranges from 56.2 to 100%. 64% of patients have Dyslipidemia, comparable to the TOPCAT study (61%). Elderly cases with an increase prevalence of obesity with CAD, stroke, diabetes and kidney disease may explain a high incidence of dyslipidemia[21].

52% of cases have Diabetes mellitus and was detected in 23 to 64% of individuals in the various studies. The high incidence of all components of the metabolic syndrome in this study confirms the earlier conclusions of relationship of the metabolic syndrome with HFpEF. In the Metabolic Syndrome- Chronic Heart Failure (MetS-CHF) study, HFpEF was found in 37.7% of cases with the metabolic syndrome[22]. It can result in microbial endothelial dysfunction in the coronary arteries by reducing the availability of protein kinase G and nitric oxide. Eventually, it causes deleterious remodeling of the heart muscle and HFpEF. However, the contributory link between them has not yet been recognized. The study included patients have coronary artery disease (CAD) in 32% and it was comparable with the previous studies which shows 30% and 53%, respectively[23-25]. Breathing difficulties are the main symptom in 98% of patients with HF. The majority of patients (74.10%) were in uncompensated NYHA Class III-IV at the time of reporting. However, they were more compensated than in the Irbesartan Heart Failure Cohort (IPRESERVE) (NYHA IV 73.3% vs. 3%). Crackles at the base of both lungs were the most common symbol, accounting for 96% of the cases found in this study. Primary basal crackles was also found in 95% of patients with HF. 24 cases (80%) have tachypnea, and 19 cases (63.3%) were found with high systolic blood pressure.

CONCLUSION

HFpEF has contributed to nearly a quarter of all hospitalizations for HF in our community. They were younger than the Western HFpEF cohort. They were mainly males with several comorbidities and were presented at the decompensated stage. Though, additional extensive epidemiologic analysis is desirable to better understand the incidence and features of HFpEF patients in Pakistan.

Author's Contribution:

Concept & Design of Study:	Kashif Ali Hashmi
Drafting:	Khawar Abbas, Hafiz Muhammad Rizwan Amjad
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Revisiting Critically:	Kashif Ali Hashmi, Khawar Abbas
Final Approval of version:	Kashif Ali Hashmi

Conflict of Interest: The study has no conflict of interest to declare by any author.

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