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ORIGINAL ARTICLE

Risk Factors Leading to Acute Decompensation of Chronic Heart Failure in Patients Presenting to a Tertiary Care Hospital, Islamabad, Pakistan

MUHAMMAD SAID NAWAZ[1], KALSOOM BIBI[2], SYED NASIR ALI SHAH[3], ZARAK KHAN[4], MUHAMMAD ILYAS[5], NOUMAN KHAN[6]
[1]*PGR Cardiology PIMS Hospital, Islamabad*
[2]*House Officer, Sir Ganga Ram Hospital, Lahore*
[3]*Associate Professor Cardiology PIMS Hospital, Islamabad*
[4,5,6]*PGR Cardiology PIMS Hospital, Islamabad*
Corresponding Author: Muhammad Said Nawaz, Email: Nawaz_222@yahoo.com

ABSTRACT

Objectives: To determine the risk factors leading to acute decompensation of chronic heart failure in patients presenting to a tertiary care hospital, Islamabad, Pakistan

Methodology: Study was conducted at Pakistan Institute of Medical Sciences, Cardiology department, Islamabad, Pakistan, 164 chronic heart failure patients aged ≥18years; diagnosed with CHF from both genders were included. Patients with sudden onset of disease and unstable vital signs, impaired mobility; diagnosis with major depression or those having cognitive functioning disorder were excluded from study.Medical records were analyzed for the patient's chronic heart failure risk factor profile i.e., history of diabetes, hypertension, hyperlipidemiaand smoking. Details of the coronary angiogram, laboratory investigations, and metabolic and cardiac biomarker were noted. Data was entered and analyzed using statistical package for social sciences (SPSS) version 2.0. P< 0.05 will be considered as significant.

Results: In study analysis it was found that out of total 164 participants, study included 78 males (47.6%) and 86 females (52.4%). out of which 157 (95.7%) were having history of hypertension and 85 (51.8%) were found to be having history of diabetes. Participant included in study who used to smoke were 92 (56.1%), patients having dyslipidemia were found to be 85 (51.8%) and 85 (51.8%) were obese. Out of all patients 157 (95.7%) were found to be having a sedentary life, while 19 (8.5%) participants have developed new ischemia. Out of all participants 93 (56.71%) were found to be having ECG changes and 72 (43.9%) were found to have cardiac enzyme changes. Mean age of participant was found to be 59.51±45.54. Mean HB level was found to be 12.8±1.8 and mean respiratory rate was found to be 19.12 ±3.4. Mean pulse was found to be 94.7±3.4. Mean BP was found to be 118.22±10.7.

INTRODUCTION

Twenty three million patients are found to be prevalent worldwide of chronic heart failure (CHF), which is found to be increasing by rate of 2 million per year.[1] The 5-year mortality rate is much higher, during the past two decades, there have been significant advancements in the treatment of patients with chronic heart failure is found to increasing and becoming leading cause of mortality specially among past five years the mortality rate because of chronic heart failure has found to be increasing..[2] Pathological abnormality causing dyspnea, pitting edema on ankle and causing fatigue and increased cardiac output with strenuous physical activity rise in intracardiac pressure in patients can be signs and symptoms of chronic heart failure[3]

More than half of coronary artery disease (CAD) occur because of systolic heart failure (HF), other leading causes include hypertension and diabetes, which also work as contributing in addition to systolic heart failure or could be .[4]older age, female gender and obesity are at stake of developing heart failure, disease such as diabetes and hypertension also plays important role in developing heart failure.[5]Six and half million hospital stays per year are found to be associated with heart failure.[6] Hospital stay associated with acute decompensated is found to be followed by HF readmission in more than 50% of cases.[7]

Acute decompensated HF is found to be prevalent more among young adults, prevalent equally in both genders i.e., male or female and prevalent in those typically having a history of hypertension, also including other medical comorbidities including hyponatremia, chronic kidney disease, hematologic abnormalities, and chronic obstructive pulmonary disease.[8]

Acute decomposed heart failure ADHF is one of leading causes of emergency department (ED) visits. Common signs and symptoms of chronic decompensated CHF includes dyspnea, orthopnea, paroxysmal nocturnal dyspnea (PND), peripheral edema, nausea/vomiting, weight gain or weight loss, elevated jugular venous pressure, hepatomegaly, pulmonary rales, cardiac gallops (S3 or S4), and pleural effusions. Underlying cause of ADHF can predict about onset of symptoms their severity of symptoms. Almost 70 percent of population with ADHF admit due to worsening chronic HF, up to 15 to 20 percent of patients present with HF for the first time, and approximately 5 percent admit for advanced or end-stage HF. Almost 8 percent patients with ADHF present with low blood pressure and less than 3 percent of patients having ADHF patients with shock[9]

This study aims to determine the precipitating, premorbid/comorbid, and other predisposing factors (with their relative frequency) leading to acute decompensationof chronic heart failure.

METHODOLOGY

Study was conducted at Pakistan Institute of Medical Sciences, Cardiology department, Islamabad, Pakistan for duration of 10 months. Prospective observational study was conducted for 164 chronic heart failure patients diagnosed on criteria of patients with dyspnea and peripheral leg edema, chest pain and patients were classified as NYHA class III. Patients were selected using non-probability consecutive sampling. Patients aged≥18years; diagnosed with CHF form both genders were included. Patients with sudden onset of disease and unstable vital signs, impaired mobility; diagnosis with major depression or those having cognitive functioning disorder were excluded from study.presence of ≥ 2 HF signs or symptoms among the Shortness of breath or dyspnea on exertion, orthopnea, paroxysmal nocturnal dyspnea, fatigue or reduced exercise tolerance, pulmonary edema, rales, peripheral edema, JVD, S3, hepatojugular reflux, altered hemodynamics, cardiomegaly. Initiation or increase in treatment with loop diuretics, or IV vasoactive agents were considered acute decompensation of chronic heart failure. After the approval from Pakistan Institute of Medical Sciences, Cardiology department, Islamabad, Pakistanethical committee.Medical records wereanalyzed for the patient's chronic heart failure risk factor profile i.e., history of diabetes, hypertension, hyperlipidemia, family history and smoking. Details of the coronary angiogram, laboratory investigations, and metabolic and cardiac biomarker were noted.Data was entered and analyzed using statistical package for social sciences (SPSS) version 2.0 and different descriptive and analytical statistics were applied according to the type of data. Mean +- SD were calculated for the quantitative variable like age. Frequencies and percentages were computed for categorical variables like gender. Chi square

test wasapplied for effect modifiers like gender and age, history of diabetes, hypertension, hyperlipidemiaand smoking. P< 0.05 was considered as significant.

RESULTS

In study analysis it was found that out of total 164 participants, study included 78 males (47.6%) and 86 females (52.4%). out of which 157 (95.7%) were having history of hypertension and 85 (51.8%) were found to be having history of diabetes. Participant included in study who used to smoke were 92 (56.1%), patients having dyslipidemia were found to be 85 (51.8%) and 85 (51.8%) were obese. Out of all patients 157 (95.7%) were found to be having a sedentary life, while 19 (8.5%) participants have developed new ischemia. Out of all participants 93 (56.71%) were found to be having ECG changes and 72 (43.9%) were found to have cardiac enzyme changes. Out of all participant 21(12.8%) have evidence of infection, out of all 86 (52.4%) had worsening renal failure, 86 (52.4%) had thyroid dysfunction, 72 (43.91%) had documented arrhythmias. Acute valvular insufficiency was seen in 157 (95.7%). hypertensive emergency was seen in 7(4.3%), pericardial tamponade was seen in 93(56.71%). Severe anemia was seen in 7(4.3%). Calcium channel blockers drug use was seen in 79 (48.2%) and drug use oral contraceptive pill was seen in 72 (43.9%). Social status upper middle class was seen in 150 (91.5%), lower middle was seen in 14(.5%). Cyanosis was seen in 7(4.3%). Raised JVP was seen in 93 (56.71%). S3 was seen in 92 (56.1%). NYHA class III was seen in 143 (87.2%) and IV was seen in 21(12.8%). Number of admissionstwo of hospital stay over last month was found in 7 (4.3%) patients and number of three admission of hospital stay over last month was found in 14 (8.5%) patients

Mean age of participant was found to be 59.51±45.54. Mean HB level was found to be 12.8±1.8 and mean respiratory rate was found to be 19.12 ±3.4. Mean pulse was found to be 94.7±3.4. Mean BP was found to be 118.22±10.7. TLC mean was found to be 19446.5±3115.

In study analysis it was seen that risk factor HTN in association with gender was found to have significant difference between two with p value of 0.005 showing that 71 males and 86 females were having HTN Risk factor DM in association with gender was found to have shown significant difference between two with p value of<0.001 showing that DM was found in 71males and 14 females. Risk factor dyslipidemia in association with gender was found to have shown significant difference with p value of <0.001 showing that dyslipidemia was found in 17males and 14 females. Risk factor smoking in association with gender was found to have shown significant difference between two with p value of <0.001 showing that smoking was found in 78males and 14 females.

Table 1: Association between STEMI and co morbid wit gender stratification

	Male (n)	Female (n)	P value
Co morbid HTN	71	860	0.005
Co morbid DM	71	14	<0.001
Dyslipidemia	17	14	<0.001
Smoking	78	14	<0.001

Table 2: Association between STEMI and co morbid with ager stratification

	Age (18-45) (n)	Age(46or above) (n)	P value
Co morbid HTN	143	46	0.49
Co morbid DM	10	75	0.28
Dyslipidemia	10	75	0.28
Smoking	11	75	0.18

In study analysis it was seen that risk factor HTN in association with age was found to have non-significant difference between two with p value of 0.49 showing that 14 individuals with age between 18-45 were having HTN while 143 were aged 46 or above aged were having HTN. Riskfactor DM in association with age was found to have shown non-significant difference with p value of 0.284 showing that DM was found in 10 individuals aged between 18-45years and75 individuals aged 45 or above years Risk factor dyslipidemia in association with age was found to have shown non-significant difference with p value of 0.28 showing that dyslipidemia was found in 10 individuals aged between 18 to 45 years and75 individuals aged 45 years or above. Smoking in association with age was found to have shown non-significant difference with p value of 0.183 showing that smoking was found in 11 individuals aged between 18 to 45 years and75 individuals aged between 45 years or above.

DISCUSSION

In study analysis it was seen that risk factor HTN, Diabetes, dyslipidemia smoking in association with gender was found to have significant difference according to previous researches hypertensive patients showed statistically significant association with gender, showing that female gender is associated with developing chronic heart failure. Previous study showed that significant difference was seen between diabetes was found to be associated with female gender and dyslipidemia is found to be associated with female gender.[10,11,12] However, smoking is associated with male gender and found to be positively associated with heart failure. Study conducted by Beusekamp in year 2022 showed that heart failure was common in males and leading cause of death mostly caused because of hypertension.[13]

In study analysis it was seen that risk factor HTN, Diabetes, dyslipidemia smoking in association with gender was found to have shown non-significant difference. Older age was found to be positively associated with chronic heart failure. Older age was found to be positively associated with diabetes and hypertension. However, our study showed non-significant relation between age and dyslipidemia and smoking. Smoking is found to be negatively associated with age and dyslipidemia is found to be associated with age.[14,15,16] Study conducted by kato et al. in year 2020 showed that chronic heart failure was associated with hypertension and diabetes and found to be prevalent more in older individuals.[17]

Study is conducted in a single setting; multiple study settings can be used to access risk factors leading to acute decompensation of chronic heart failure. Study can be conducted to find out association between severity of symptoms and occurrence of chronic heart failure.

CONCLUSION

Study concluded acute decompensated chronic heart failure was prevalent more in males because of risk factors such as hypertension, dyslipidemia and smoking.

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