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Original Article

Study on Heart Failure Patients Admitted in National Institute of Cardiovascular Diseases

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Key words:
Heart failure, Ischaemic heart disease, Ischaemic cardiomyopathy

Abstract

Background: *Heart failure is a complex clinical syndrome that arises secondary to abnormalities of cardiac structure and/or function (inherited or acquired) that impair the ability of the left ventricle to fill or eject blood. There is a paucity of data on characteristics of the patients of heart failure admitted in hospitals in terms of demographic and etiological information. So, this study aimed to see the disease burden of heart failure patients and the age and sex specific prevalence of heart failure among patients admitted into NICVD and to identify the etiological pattern of diseases leading to heart failure with associated comorbid factors.*

Methods: *It was a cross sectional study carried out at National Institute of Cardiovascular Diseases (NICVD) Dhaka Bangladesh and was conducted from January 2015 to December 2015. Total 400 heart failure patients were taken.*

Results: *The mean age of the patients were 54 ± 14 years ranging from 16 to 95 years with a high preponderance of male. Most the patient population was in the age group of 51- 60 years (29.5%). 79% of the cases were male & 21% female by gender specification. Ischaemic cardiomyopathy (ICM) was found to be the common cause of heart failure (n=153, 40.75%) followed by Acute coronary syndrome (32.5%) and Valvular heart disease (18.25%). The patients with heart failure having acute coronary syndrome (n=107) had hypertension (46.8%) as the most prevalent major risk factor. In the present study only 11% patient had heart failure with preserved ejection fraction. Mortality rate of the study population were 6.3%.*

Conclusion: *In this study, the most common cause of heart failure is ischaemic heart disease. So, patients of acute and chronic ischemic heart disease patients should be treated and follow up with care. Clinical and epidemiological studies are needed to explore further.*

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Introduction:

Heart failure is a complex clinical syndrome that arises secondary to abnormalities of cardiac structure and/or function (inherited or acquired) that impair the ability of the left ventricle to fill or eject blood.

Bangladesh is passing through an epidemiological transition. Burden of infectious diseases are coming down while with increased life expectancy and wide spread change of lifestyle, non-communicable diseases are on the rise. Cardiovascular diseases are one of the main causes of morbidity and mortality in this country now. Heart failure (HF) is a significant and growing health problem as the population ages. Despite improvements in therapy, mortality and morbidity remain high.[1,2] In the United Kingdom, most patients admitted to hospital with HF are more than 65 years old and remain inpatients for a week or more. Prevalence of heart failure rises from around 1% in the age group 50-59 years to between 5 and 10% of those aged 80-89 years.[3] Heart failure is frequently due to coronary artery disease, tends to affect elderly people and often leads to prolonged disability. Although the outlook depends to some extent on the underlying cause of the problem, heart failure carries a very poor prognosis,

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approximately 50% of patients with severe HF due to severe left ventricular dysfunction will die within two years.[3] Hospitalized heart failure patients are regarded as prognostically more adverse with a high mortality and readmission rate. However, there is a paucity of data on outcomes of heart failure in Indo Asian.[4]

There is an ever-increasing number of hospital admissions due to heart failure in different hospitals in Bangladesh, however there is a paucity of data on characteristics of the patients in terms of demographic and etiological information. It is important to identify the etiological factors associated with HF in this population to determine strategy for prevention and early detection. In this study, we sought to determine the disease burden of heart failure patients and the age and sex specific prevalence of heart failure among patients admitted into National Institute of Cardiovascular Diseases (NICVD), Dhaka and to identify the etiological pattern of diseases leading to heart failure with associated comorbid factors.

Study Methods:

This was a cross sectional study carried out at National Institute of Cardiovascular Diseases (NICVD) Dhaka Bangladesh. It is the apex centre for cardiovascular science in the country for giving specialized patient care in the respective field. The study was conducted from January 2015 to December 2015. Total 400 heart failure patients (aged more than 15 years) admitted in cardiology department in NICVD were taken as study population. Variables recorded include age, sex, history of diabetes mellitus (DM) (defined as a fasting glucose = 126 mg/dl or on treatment), hyperlipidemia (fasting total cholesterol = 200mg/dl or on treatment), hypertension (blood pressure =140/90mmHg or on treatment). Associated co-morbidity were classified into some major group of heart diseases: Acute coronary syndrome (ACS), chronic ishchaemic heart disease, dilated cardiomyopathy (including ischaemic and other causes), valvular heart diseases, hypertensive heart disease, congenital heart diseases. Among the ACS-Acute ST elevated myocardial infarction (STEMI), Non-ST elevated myocardial infarction (NSTEMI), and Unstable angina (UA).

Ethical approval for this study was granted by the ethics committee. Detailed clinical history of patients was taken followed by detailed clinical examination and laboratory tests. Data was recorded in preformed sheets. A master chart was prepared with the requisite variables to analyze the etiology of HF. Laboratory testing (done in all patients), complete blood picture, erythrocyte sedimentation rate, blood sugar, urea, serum creatinine, electrolytes, protein, liver function tests, lipid and thyroid profile, CK-MB, serum troponin I, pro BNP, chest X-ray (PA view), ECG (12-lead multi-channel), echocardiography (color doppler), for selected patients coronary angiography (CAG) were done.

Results:

The mean age of the patients were 54 ± 14 years ranging from 16 to 95 years with a high preponderance of male. Most the patient population was in the age group of 51- 60 years (29.5%) (Table I). 79% of the cases were male & 21% female by gender specification (Table II). Ischaemic cardiomyopathy (ICM) was found to be the common cause of heart failure (n=153, 40.75%) followed by Acute coronary syndrome (32.5%) and Valvular heart disease (18.25%) (Table III). Among the total study population, 58% patients were hypertensive and 51% patients were diabetic (Table IV). 7.75% (n=31) patients had hypertensive heart disease leading to heart failure. The patients with heart failure having acute coronary syndrome (n=107) had hypertension (46.8%) as the most prevalent major risk factor; diabetes was found to be second common comorbid factor. Patients with ischaemic cardiomyopathy (n=153) had DM (n=79; 42.6%) as most prevalent comorbid factor. In the present study only 11% patient had heart failure with preserved ejection fraction (Fig 2). Mortality rate of the study population were 6.3%.

Table-I

Age distribution of the study population (N=400).

Age	Number	Percentage
16-30 years	28	7
31-40 years	41	10.2
41-50 years	85	21.2
51-60 years	118	29.5
61-70 years	83	20.7
71-80 years	36	9
≥81 years	9	2.2

Table-II

Sex distribution of the study population (N=400).

Character	Number	Percentage
Male	316	79
Female	84	21

Table-III

Etiology of heart failure.

Etiology	Number	Percentage
Acute coronary syndrome	107	32.5
Chronic ischaemic heart disease	11	2.75
Ischaemic cardiomyopathy (ICM)	153	40.75
Dilated cardiomyopathy (DCM)	13	4.3
Postpartum cardiomyopathy	9	2.25
Hypertensive heart disease	31	7.75
Valvular heart disease	68	18.25
Corpulmonale	2	0.5
Congenital heart disease	5	1.25
Hyperthyroidism	1	0.25

Table-IV

Associated risk factors.

Comorbid conditions	Percentage
Diabetes	51
Hypertension	58
Dyslipidaemia	39
Smoker	26

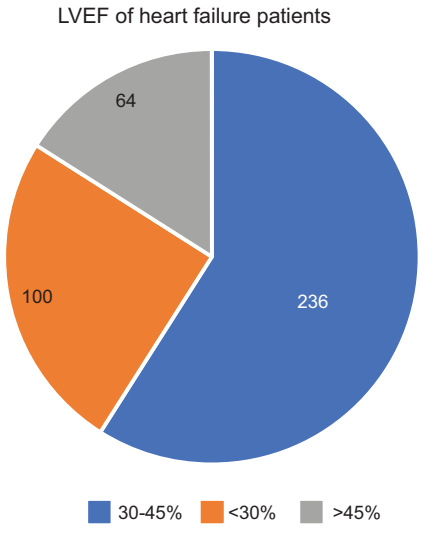

Fig.-1: *Left ventricular ejection fraction (LVEF) of heart failure patients.*

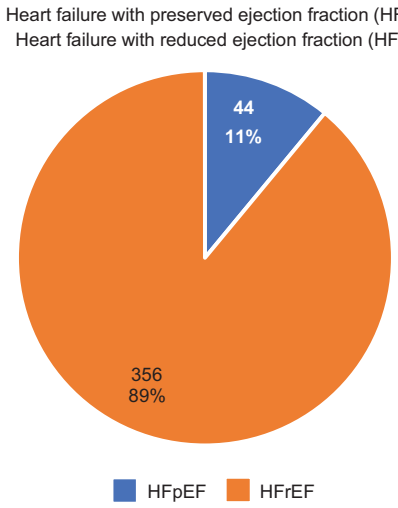

Fig.-2: *Heart failure with preserved and reduced ejection fraction.*

Discussion:

Total 400 patients of heart failure were enrolled. Average age was 54 ± 14 years. Most of the patients (29.5%) in 51-60 years age groups. In SOLVD clinical trial,[5] mean age was 61 years. In DIG study (1997),[6] RALES study,[7] MERIT-HF study,[8] ATLAS Study [9] - mean age was 64 years. M Kabiruzzaman, et al. showed mean age was 54 years [10]. MT Rahman, et al. showed mean age was 46 ± 07 years[11]. The Hillingdon heart failure study, the median age at the time of diagnosis of heart failure was 76 years. The incidence of heart failure was significantly higher in men than women at all ages with an age-standardized ratio of 1.75. The primary etiologies were coronary heart disease (36%), unknown (34%), hypertension (14%), valve disease (7%), atrial fibrillation alone (5%), and other (5%).[12] Mcmurray et al.[13] studied trends in hospitalization for heart failure in Scotland 1980-1990. They found seventy-eight percent of discharges were in persons aged > 65years and 48% of discharges were male. In the present study, Male was 75% and Female was 25%. In SOLVED clinical trial,[5] male was 80% and female was 20%. In DIG study [6] and MERITHF[8] male was 78%. MT Rahman et al. [11] showed male 75%. M Kabiruzzaman et al. [10] showed male 72%.

In the present study, the patients having diabetes was 51%, hypertension 58%, dyslipidaemia 39%, smoking habit 26% - as risk factor. MT Rahman et al. showed 45% had history of hypertension, 29% had diabetes, 27% had respiratory disease. In

SOLVD clinical trial [5] 42% had hypertension, 26% had diabetes. In MERIT-HF clinical trial [8] 44% had hypertension, 25% had diabetes.

In the present study the most common cause of heart failure is due to ischaemic heart disease 76%, (Acute Coronary Syndrome 32.5%; Ischemic Cardiomyopathy 40.75% and Chronic Ischemic Heart Disease 2.75%). MT Rahman et al. showed 69.42% of heart failure patients are due to Ischemic Heart Disease. In SOLVD clinical trial 71% had ischemic cause of heart failure, in DIG study[6] 70% had ischemic cause of heart failure, in MERIT- HF 66% had ischemic cause of heart failure. In ATLAS study,[9] 64% had ischemic cause of heart failure. In RALES study,[7] 54% had ischemic cause of heart failure.

In our study 7.75% heart failure patients are due to hypertension. 8.39% patients had hypertensive heart failure, In DIG study, 9% had hypertensive heart failure and in ATLAS study,[9] 20% had hypertensive heart failure.

MT Rahman et al.[11] showed 15.29% had valvular cause of heart failure. In ATLAS study, 06% had valvular cause of heart failure. In SPICE registry,[15] 05% had valvular cause of heart failure. In the present study 18.25% failure patients are due to valvular heart disease. M Kabiruzzaman et al.[10] showed 22.18% had valvular cause of heart failure. The increased incidence of rheumatic valvular heart disease in our country might be the cause of increased number of patients of heart failure due to valvular heart disease in the present study than studies conducted in developed countries.

In our study, 04.3% patients had dilated cardiomyopathy. In SOLVD clinical trial 18% had DCM, in DIG study 15% had DCM as a cause of heart failure, in SOLVD registry 13% had DCM.[14] In ATLAS study, 28% had DCM as a cause of heart failure. In SPICE registry,[15] 17% had DCM. MT Rahman et al showed 04.12% was diagnosed as DCM (Dilated Cardiomyopathy) as a cause of heart failure.

In another study Jafary et al. studied 196 patients with mean age 61.2 ± 12.8 years with a high preponderance of males. All of them have been suffering from systolic heart failure with LVEF d"40%, requiring hospital admission with more than 60% suffering from hypertension (67.3%) and diabetes mellitus (60.7%) and more than three-fourths having a history of coronary artery disease in the past.[4] In the present study 51% patient had diabetes mellitus, 58% patient had had hypertension.

In the United Kingdom, most patients admitted to hospital with heart failure are more than 65 years old. The prevalence of heart failure rises from around 1% in the age group 50-59 years to between 5 and 10% of those aged 80-89 years. Heart failure is frequently due to coronary artery disease.[3] This finding is consistent with the present study.

In the present study most of the patients having LVEF within 30-45%. Seow et al.[16] studied 225 patients in Singapore with LVEF <40%, their mean age was 68.5± 2.3 years and more than 51.1% of the subjects were aged 70 years and more. The most common cause of HF was coronary heart disease (85.5%). Co morbid medical conditions were prevalent in this cohort, with 83.5% having at least one co-morbid condition. Hypertension was the most prevalent co-morbid condition; affecting 60% of the patients; followed by diabetes mellitus (56.9%).

Remes et al.[17] studied incidence of heart failure in 45- 74-year-old inhabitant in four rural communities in Eastern Finland. The incidence rates of heart failure increased with age in both sexes. Coronary heart disease or hypertension was evident in 80% cases.

Epidemiologic studies indicate that up to 50% of patients with heart failure have a preserved ejection fraction.[22] In the present study 11% of patients had preserved ejection fraction. The cause of this less number might be due to lack of effort for diagnosis as well as less referral.

Conclusion:

Despite a decline in age adjusted mortality from IHD in developed countries overall, the number of patients with IHD is increasing. As coronary artery disease is the most powerful risk factor for heart failure it is likely that the aforementioned trends will lead to an increase its future prevalence. Heart failure may, therefore, become a more common manifestation of chronic ischaemic heart disease and contribute too many more deaths. In our study, we find the most common cause of heart failure is ischaemic heart disease

though the number of the patients is small. We suggest from our study that patients of acute and chronic ischemic heart disease should be treated and follow up with an attention for development of heart failure. The number of patients with heart failure will increase day by day if appropriate measures not taken to manage risk factors and to increase public awareness. Clinical and epidemiological study on the larger scale is needed to explore further assessment of the problem in our country.

Conflict of Interest - None.

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