Prevalence and short-term prognosis of heart failure: An in hospital prevalence study

Trinath Kumar Mishra[a],*, Biswajit Das[b], S.N. Routray[b]

[a] *Department of Cardiology, M.K.C.G Medical College, Berhampur, India*
[b] *Department of Cardiology, S.C.B Medical College, Cuttack, India*

ABSTRACT

Despite the magnitude of the burden of heart failure, effective new therapies capable of reducing the prevalence, early mortality or rehospitalisation have not been developed over the last decade. The incidence and prevalence estimates of heart failure are unreliable in India because of the lack of surveillance systems to adequately capture relevant data.

Aim of the study: To ascertain the prevalence & prognosis of hospitalised heart failure patients.

Materials and methods: The study was conducted in Institute of Cardiovascular Sciences, SCB Medical College, Cuttack over a period of 5 years from September 2009 to September 2013. The patients having heart failure were included in the study. The detailed history, clinical findings and investigations were retrieved from the department archives and were studied in detail.

Results: Out of 23,987 hospitalised patients heart failure was diagnosed in 2641 (11%) cases. Out of 2641 patients, dilated cardiomyopathy was diagnosed in 34% (900) of cases, valvular heart disease(VHD) in 29.5% (781) cases, coronary artery disease in 18.3% of cases. Other causes include hypertension with left ventricular failure (6.8%), postpartum cardiomyopathy (7%), myocarditis (2.3%) and congenital heart disease (2.1%). The overall in hospital mortality was 14.2% and the mortality among patients with cardiogenic shock was 62.4%. The median hospital stay was 8 days.

Conclusion: Heart failure occurs at a younger age in Indians compared to the western countries. The most common etiology is DCM followed by VHD. Since this is a retrospective analysis and has its own limitations, community based heart failure study taking a clue from the present study can be done to achieve invaluable data.

© 2018

1. Introduction

Heart failure(HF) is a clinical syndrome with symptoms and signs caused by cardiac dysfunction resulting in reduced longevity. It is one of the 2 cardiovascular conditions still on the rise in the United States with a prevalence of 5.8 million in the US and over 23 million worldwide.[1] Its prevalence is expected to increase by 46% to over 8 million Americans by the year 2030. The prevalence of HF in India has been estimated by risk models to range from 1.3 to 4.6 million, with an annual incidence of 0.5–1.8 million while the prevalence in rural population has been reported as 1.2 cases/1000.[2,3] The prevalence of HF in India is possibly on the rise as India remains doubly beset by the rise in the risk factors of traditional cardiovascular disease and the persistence of pretransitional diseases like rheumatic heart disease, endomyocardialfibrosis,tubercular pericardial disease and anemia.

Data on HF in India remains nebulous and confined to select registry data. A study on HF in low and middle income countries included only 1 study from India, highlighting the unmet need in this field.[4] It is sobering to note that the available data reveals that unlike the West where HF is a disease of the elderly, it affects the economically and socially productive age group in India. A study estimated the total HF spending in India in 2012 to be $1.18 billion, with an estimated direct cost of $80 million and indirect cost of $1.1 billion.[5] In the current scenario where 90% of health needs are met by out of pocket expenditure, the implications for the individual and society are profound. Hence,the need for a study detailing the patient characteristics, treatment and outcome of patients suffering from HF.

2. Materials and methods

The study was conducted at the Institute of Cardiovascular Sciences,SCB Medical College, Cuttack over a period of 5 years from September 2009 to September 2014. A total of 23,987 consecutive patients admitted to the department were studied retrospectively.

---

* Corresponding author.
  E-mail address: drtkmishra@yahoo.com (T.K. Mishra).

The patients diagnosed as having heart failure were included in the study. Diagnosis of HF was based on Framingham's criteria for HF as per institutional protocol. Out of 24,000 hospitalisedpatients, heart failure was diagnosed in 2641 patients. A cut eexacerbation of chronic heart failure cases and refractory HF cases were also included. The detailed history,clinical findings and investigations were retrieved from the department archives and studied in detail.

Dilated cardiomyopathy(DCM) was diagnosed from history, ECG and ECHO criteria or angiographic supplementation where available.

Coronary artery disease(CAD) was defined as clinical history of myocardial infarction (anterior/lateral/inferior/right ventricular), ECG abnormalities, ECHO evidence of regional wall motion abnormality (RWMA) or angiographic confirmation of CAD.

Valvular heart disease (VHD) was diagnosed from history of Rheumatic Heart Disease and echocardiographic evidence of valvular abnormalities or degenerative valvular disease.

Diabetes mellitus (DM) was defined as per definition given by American Diabetes Association. Hypertension (HTN) was defined as per definition of Joint National Committee (JNC) VII report.

3. Results

Out of 23,987 hospitalisedpatients, HF was diagnosed in 2641 (11%). The patients were in the age range of 21–80 years with a mean age of 53.4 years. The mean age is highest in DCM (63.2 years) and lowest in VHD group (41.2 years). 1741 patients were mae and 900 patients female with a male to female ratio of 1.9:1.

History of HTN and DM was present in 71.3% and 47.5% respectively. 295 (12%) had past history of CAD.Chronic obstructive pulmonary disease (COPD) was present in 396 (15%) cases and history of stroke or TIA was present in 343(13%). 1619 patients (61.3%) had de novo HF (HF presenting for the first time).

For etiological analysis, the study population was divided into four categories-DCM, VHD, CAD and others as displayed in Fig. 1. The most common cause was DCM which was diagnosed in 900 (34%) followed by VHD in 781 (29.5%) and CAD in 479 (18.3%).Other causes include HTN with left ventricular failurein 197(6.8%), postpartum cardiomyopathy in 173 (7%),myocarditis in 57 (2.3%) and congenital heart disease in 54(2.1%).

Among patients of DCM, 66.7% were male and 33.3% were female. In the CAD category, 75% were male and 25% were female. The VHD group consisted of 69.2% males and 30.8% females while

in the "others" category, 50% were male and 50% were female. The sex ratio amongst these four groups is statistically significant. (p<0.001)

De novo HF is seen in 60% cases of DCM.62.5% of CAD, 61.5% of VHD and 50% of "others" category and was found to be statistically significant (p<0.001). 73.3% of cases of DCM and 75% of cases of CAD were diabetic.DM was present in none of VHD and 50% of "others" category. The association of DM with HF in these four categories was statistically significant (p < 0.001).

HTN was present in 71.3% of cases. The average range of systolic blood pressure(SBP)in our study was 148–160 mmHg. The association of HTN in all four categories was statistically significant(p < 0.001). History of COPD was found in 20% of cases of DCM, 15% of CAD, nil in VHD and 25% of "others". Similarly, 20% of DCM, 12.5% of CAD and 15.4% of VHD had previous history of stroke/TIA. Both history of COPD and stroke/TIA were found to be statistically significant (p < 0.001)

Atrial fibrillation was present in 13.3% of DCM, 19.2% of VHD,9.3% of "others" and nil in CAD. (p = 0.001). ECG abnormalities were present in 46.7% of DCM out of which 26.7% had RBBB and 20% had LBBB.The laboratory parameters are tabulated in table. The mean creatinine value is 1.4 mg/dl with a range of 0.3–3.3 mg/dl. 34% of patients had high creatinine values (>2 mg/dl) at the time of diagnosis.Similarly,hyponatremia ($Na^+ < 135$ meq/l) was seen in 22.7% and hyperkalemia ($k^+ > 5.5$ meq/l) in 15.9%. Anemia, defined as Hb < 12 g/dl in females and <13 g/dl in male) was present in 65.9% of cases.

In patients with DCM,antiplatelet drugs were prescribed to 6.6%, anticoagulant to 13.3%, ACE inhibitors to 60%, beta blockers to 60%, calcium channel blockers (CCBs) to 26.7%, diuretics to 55%, spironolactone to 55%, digoxin to 65% and nitrates to 13.3%. The drugs prescribed to CAD patients included antiplatelets (57.5%), anticoagulants (56.3%), beta blockers (55%), ACE inhibitors (40%), CCB (7%), diuretics (12%), spironolactone (40%),statins (45%) and nitrates (20%). In VHD, the drugs prescribed were antiplatelets (5%), anticoagulants (33.33%), ACE inhibitors (15%), beta blocker (50%), CCB (45%), diuretics (5%), spironolactone (5%),digoxin (50%). Among other cases,the patients received ACE inhibitos (50%), beta blockers (55%), CCBs (20%), diuretics (45%), spironolactone (15%), statins (5%), digoxin (40%) and nitrates (23.3%). The details are given in table. Overall, 2430 (92%) patients required inotropes and vasopressor support for initial management. 343(13%) patients presented with cardiogenic shock and needed more aggressive therapy with multiple vasopressors and inotropes.The commonest cause for cardiogenic shock was CAD (55.6%) followed by DCM (43%). The in hospital mortality among patients of cardiogenic shock was 62.4% and the overall in hospital mortality was 14.2%. The median hospital stay was 8 days (4.5 days for patients who died and 9.7 days for those discharged).

4. Discussion

The mean age of patients in our study was 53.4 years. This is comparable with earlier Indian studies such as the Trivandrum heart failure registry(THFR) (61.2 years) and Medanta registry(58.9 years).[6,7] In a recently published North Indian study(INDUS), the mean age of patients was even lower (39±16 years).[3] The mean age of Asian patients in ASIAN-HF and INTER-CHF is 60 years.[8,9] However, it is much lower than Western data such as AHEAD registry (71.5 years) and ADHERE registry (72.4 years) conforming to the observation that CVD affects Indians at least a decade earlier than Europeans.[10,11] Heightened patient awareness and better health care accessibility leading to better management of the inciting factors is possibly contributory. The male to female ratio in our study was 1.9:1 and when compared amongst the four groups was found to be statistically significant (p < 0.001).This male
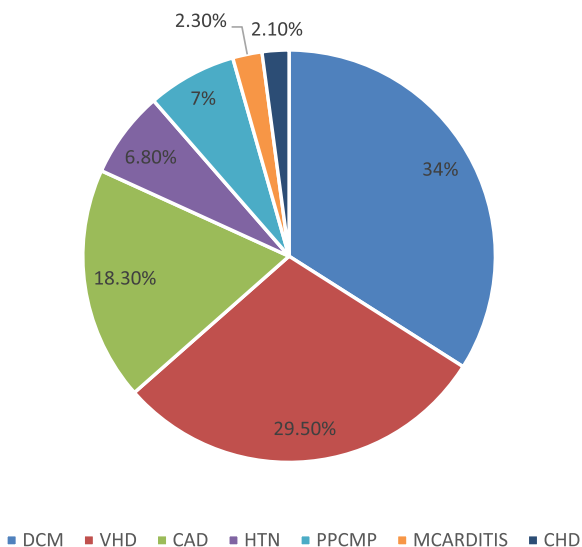

Fig. 1. Pie chart representation of etiology of heart failure.

Legend: DCM, VHD, CAD, HTN, PPCMP, MCARDITIS, CHD

(pie chart values: 34%, 29.50%, 18.30%, 6.80%, 7%, 2.30%, 2.10%)