

ORIGINAL ARTICLE

INPATIENT BURDEN OF HEART FAILURE IN THE CARDIOLOGY UNITS OF TERTIARY CARE HOSPITALS IN PESHAWAR

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Background: Recent evidence from studies based in the general population, general practice and hospital suggest that an epidemic of heart failure is emerging both in the developed and the developing countries. The present study was carried out to estimate the in-patient burden of heart failure in the cardiology units of the two main tertiary care hospitals of Peshawar (HMC and LRH) over the last 3 years. **Methods:** A clinical audit was carried out in which the data from 2008 to 2010 was retrieved from the database of the cardiology departments of both LRH and HMC Peshawar. The data was analyzed on yearly basis to calculate the total number of admissions, the frequency of admissions with the primary diagnosis of heart failure and the duration of hospital stay at each admission. **Results:** The total admissions into the cardiology unit in HMC were 3502 in 2008, 4235 in 2009 and 5112 in 2010. Out of these, admissions with the diagnosis of Heart Failure constituted 14.75%, 19.32% and 22.87% respectively. The average duration of hospital stay of the patients was 4.97 (1 to 7) days, 4.29 (1 to 12) days and 3.83 (1 to 18) days respectively. The admissions into cardiology department of LRH with the diagnosis of Heart Failure constituted 17.25%, 21.22% and 22.35% of the total admissions 9200 in 2008, 10,685 in 2009 and 11,475 in 2010. The average duration of hospital stay of the patients was 2.78 (1 to 5) days, 2.35 (1 to 5) days and 2.09 (1 to 7) days respectively. **Conclusion:** There is an increasing trend seen in the presentation of heart failure to the cardiology units along with an increasing bed occupancy rate. This implies an escalating trend in hospitalisation costs of heart failure management, necessitating serious consideration for some drastic steps for controlling the ever-growing epidemic of heart failure.

Keywords: Heart failure, Epidemic, Comorbidities

INTRODUCTION

Aging of the population and prolongation of the lives of patients with cardiovascular diseases (CVD) by modern therapeutic innovations has led to an increasing prevalence of heart failure (HF). Despite improvements in therapy, the mortality rate in patients with HF has remained unacceptably high, making early detection of susceptible persons who would benefit from preventive measures, imperative.¹ The magnitude of the problem of HF cannot be assessed with precision since reliable, population-based estimates of its prevalence, incidence, and prognosis are lacking.^{2,3}

Chronic heart failure (CHF) places a heavy burden not only on patients and their families but also on society, through enormous use of health care resources. CHF impairs quality of life more than almost any other chronic medical problem.

A 2007 update from the American Heart Association (AHA) estimated that there were almost 5.2 million people with HF in the United States. There are an estimated 23 million people with HF worldwide.⁴ There has been an increase in the prevalence of HF in the population over time especially in the last two decades. In one study, the average increase from 1989 to 1999 was 1/1000 and 0.9/1000 for women and men, respectively.⁵ This has been associated with a 3 to 4-fold

rise in the rate of hospitalisation for HF from 1971 to 1999.^{4,5} CHF has an overall population prevalence of approximately 1–3%, rising to approximately 10% in the very elderly. Following a first hospital admission for heart failure, patients have a 5-year mortality of 75% –a survival rate worse than that for most forms of cancer.⁶ Several elements are contributing to this rise, particularly aging of the population. In addition, improved treatment of hypertension and valvular and coronary disease is allowing patients to survive an early death only to later develop HF. The prevalence of HF in the United States is projected to rise over the next four decades with an estimated 772,000 new HF cases projected in the year 2040.⁷

A similar escalating trend of HF patients' consultation and admission has also been observed in our local population. We, therefore, carried out this study to estimate the total in-patient burden of heart failure admissions in the two major tertiary care hospitals of Peshawar, Lady Reading Hospital (LRH) and Hayatabad Medical Complex (HMC) providing cardiac care facilities to the local population.

MATERIAL AND METHODS

A clinical audit was carried out in which the data from January 2008 to December 2010 was retrieved

from the database of the Cardiology Departments of two tertiary care hospitals in Peshawar. Both of these are tertiary care hospitals. The three years' data was retrieved from the computerised database of the Department of Cardiology, Lady Reading Hospital (LRH), Peshawar. The data from Hayatabad Medical Complex, Peshawar, was obtained manually from the hospital records. All patients admitted into the Cardiology units of both of these hospitals with the primary diagnosis of Heart Failure (HF) were included in the study, irrespective of the cause of HF (e.g., ischemic cardiomyopathy, dilated cardiomyopathy, rheumatic heart disease, etc.). The data was analysed on yearly basis to calculate the total number of admissions into the respective units, the frequency of admissions with the primary diagnosis of heart failure, and the duration of hospital stay of each admission with HF. Statistical analysis of the variables was done using SPSS-15.

RESULTS

The total admissions into the cardiology unit in HMC were 3502 in 2008, 4235 in 2009 and 5112 in 2010 (Figure-1). Out of these, admissions with the diagnosis of Heart Failure constituted 14.75%, 19.32% and 22.87% respectively. As shown in Figure-2, the admissions into cardiology department of LRH with the diagnosis of Heart Failure constituted 17.25 %, 21.22 % and 22.35 % of the total admissions 9200 in 2008, 10,685 in 2009 and 11,475 in 2010.

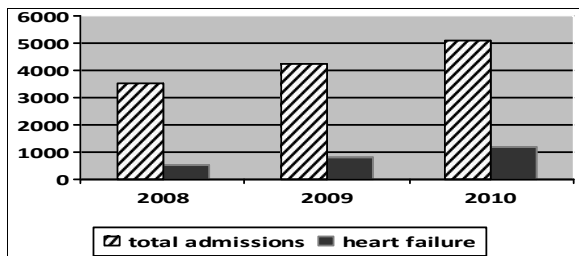


Figure-1: Percentage of heart failure admissions among the total admissions cardiology department of HMC

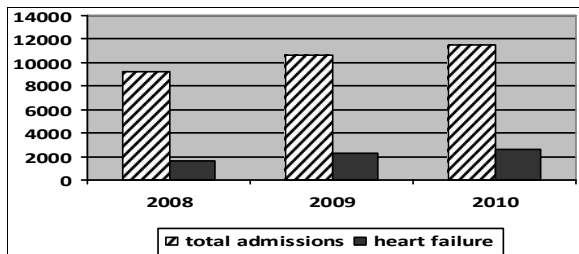


Figure-2: Percentage of heart failure admissions among the total admissions cardiology department of LRH

The average duration of hospital stay of 516 patients with heart failure in HMC during the year 2008 was 4.97 (range 1–7) days. The number of patients with the diagnosis of heart failure increased to 814 in the year 2009 with an average hospital stay of 4.29 (range 1–12) days. It further increased to 1169 in the year 2010 and occupied beds for an average of 3.83 (range 1–18) days, as depicted in Table-1.

The average duration of hospital stay of 1587 heart failure patients in LRH during the year 2008 was 2.78 (range 1–5) days. In 2009, 2267 patients with the diagnosis of heart failure occupied the beds for an average of 2.35 (range 1–5) days, while in 2010, the number of in-patients with heart failure increased to 2564 and their hospital stay was of 2.09 (range 1–7) days, (Table-1).

Table-1: Heart failure bed occupancy rate in LRH and HMC

Year	HMC	LRH
2008	4.97 days (1–7) n=516	2.78 days (1–5) n=1587
2009	4.29 days (1–12) n=814	2.35 days (1–5) n=2267
2010	3.83 days (1–18) n=1169	2.09 days (1–7) n=2564

DISCUSSION

Heart failure has been singled out as an emerging epidemic.⁸ This may be occurring as a result of increased incidence, increased survival leading to increased prevalence or both factors combined. As measured by Vital Statistics, the burden of heart failure and its societal costs are enormous, thereby epitomising a public health problem as underscored in guidelines from the American Heart Association.⁹ Indeed, heart failure is the single most frequent cause of hospitalisation in persons 65 years of age or older and approximately 4.9 million Americans carry this diagnosis.¹⁰ National Hospital Discharge Survey data from 1979 to 2004 indicate that the number of hospitalisations with any mention of heart failure tripled from 1,274,000 in 1979 to 3,860,000 in 2004.¹³ People of Indo-Asian origin have one of the highest susceptibilities to coronary artery disease (CAD) in the world,^{12,13} and it is therefore unsurprising that CAD, the leading cause of CCF, is also the leading cause of mortality in the region.¹⁴ Meta-analysis of previously conducted studies suggests an almost 2.5-fold rise in the prevalence of CAD in two decades—from 3.6% in the 1970’s to 9.5% in the 1990’s in people aged ≥35 years in India.^{15,16} These staggering numbers underscore the public health burden of heart failure.⁹ The paper of Stewart *et al* describes trends in hospitalisation for heart failure that occurred from 1990 to 1996 in Scotland.¹⁷ The hospitalisation rates for heart failure not just increased considerably, but the proportion of patients having multiple hospital admissions was also rising.

Regarding seasonal variations in heart failure hospitalisation and mortality in France, Boulay *et al* have documented an increasing number of heart failure hospitalisations from 1995 to 1997.¹⁸ As hospital admissions are the major driver of health care costs in heart failure,¹⁹ understanding the epidemiology of hospital admissions in heart failure, its determinants and significance for the outcome of the disease as assessed by the proportion specifically related to heart failure exacerbation, is of utmost importance.

As depicted in our study, there is an escalating trend of heart failure admissions in our local population—it has increased from 14.75% to 22.87% in 3 years' time period at HMC, while it increased from 17.25% to 22.35% at LRH over the same time period. This is in complete agreement to studies from the West.^{4-7,10,11} However, it has been noticed that our prevalence (as per our hospital record) is much higher as compared to West. There can be several explanations for this. Firstly, there is a very high occurrence of HF due to rheumatic heart disease in our part of the world. Secondly, a vast majority of our patients with CAD do not get revascularization, either due to late presentation for thrombolytic, or inaccessibility or unaffordability for revascularisation (whether PCI or CABG); as a result of untreated or ongoing ischemia, they tend to develop HF. Another important factor is the lack of compliance to medical therapy for heart failure due to un-affordability, or the improper management of HF patients by quacks in rural areas, accounting for multiple readmissions with worsening of HF. Moreover, there is a high prevalence of comorbid conditions in our population that may in part be accounting for the high admission and readmission rates.²⁰⁻²² Therefore, it is not surprising that hospitals in our set up have to bear a worse brunt of heart failure than those in the West.

Another noteworthy factor in our study is that our hospitalisation statistics were event-based, not person-based, this allowed multiple hospitalisations for the same individual to be counted without distinguishing between first and subsequent admission such that incidence could not be derived from the data. Thus, this information, while crucial to assess the health care implications of heart failure, does not measure hospitalisations experienced by individual patients, and do not provide insight into the real burden (number and duration) of hospitalisations experienced by individual patients living with heart failure and how it may have changed over time. Moreover, heart failure is a chronic disease characterised by bouts of exacerbation leading to recurrent hospitalisations. Thus, measures of the frequency of heart failure-specific hospitalisations are essential to gain insight into the effectiveness of its treatment. Indeed, medications for heart failure cannot be expected to appreciably reduce all hospitalisations among persons with heart failure, given the high

prevalence of comorbidity in these patients. There are other possible reasons for the sparse and inconsistent data on the prevalence and particularly the incidence of heart failure; firstly, several estimates are derived from hospital discharges, and the diagnoses are not always validated using standardised criteria. Secondly, inpatient data may not capture all cases of heart failure as care is increasingly delivered in the outpatient setting.²³

Another important finding noted is that all the previous studies are heterogeneous in many ways including setting, population studied, and criteria used to diagnose the index heart failure, and heart failure-related hospitalisations. Thus, not unexpectedly, their results lack consistency. Using standardised criteria, the incidence of heart failure in an earlier study from Framingham was between 1.4 and 2.3 per 1000/year among persons 29 to 79 years old.³ Among other studies^{5,17,24,25}, few^{5,24,26,27} included outpatient data. It is not surprising therefore that their results differ. They, however, prompt the question of whether the stabilisation of the heart failure hospitalisation rates could be offset by increasing outpatient care practice. It is however noted that the trends among the elderly are different underscoring the importance of careful consideration of age in the evaluation of the burden of heart failure. Indeed, data from the Kaiser Permanente system comparing the incidence of heart failure in 1970 to 1974 and 1990 to 1994 among persons 65 years old or greater indicated that the age-adjusted incidence increased by 14% over time and was greater for older persons and for men²⁸. The Framingham²⁷ and Olmsted County²⁶ studies have shown trends toward increasing heart failure incidence among older persons contrasting with trends among younger persons. This pattern of increasing trends among older persons in three carefully conducted population studies is important to note given the aging of the population. This underscores the imperative for continued community surveillance of heart failure in diverse populations.

Future epidemiology research should investigate the heart failure epidemic in our population; examine the burden and determinants of hospitalisations in heart failure, and devise strategies to fight this 'epidemic of heart failure'. Newer models of care are needed to accommodate the needs of the growing population of heart failure patients and the wide range of treatments available. It is important to characterise recurrent outcomes, i.e., hospitalisations in chronic diseases like heart failure, the outcome of which is characterised by recurrence/exacerbation. The analysis of the various events leading to multiple hospitalisations shall provide new insight on the outcome of heart failure by characterising patterns of hospitalisations and identifying subjects at risk for recurrent hospitalisations that should be offered aggressive preventive strategies.

Our study pertains to hospitalised cases and measure re-admissions. Yet, a large proportion of incident heart failure cases are diagnosed in outpatient settings such that the numbers reported do not pertain to the entire spectrum of patients with heart failure. Moreover, the impact of death was not taken into account in our study, which further hinders the validity of our results.

CONCLUSIONS

There is an increasing trend seen in the presentation of heart failure to the cardiology units along with an increasing bed occupancy rate. This implies an escalating trend in hospitalisation costs of heart failure management, necessitating serious consideration for some drastic steps for controlling the ever-growing epidemic of heart failure.

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