HEART FAILURE IN INDIA – BURDEN AND THE CHALLENGES

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India is the second most populous country in the world after China and is undergoing epidemiological transition. The already established burden of infectious diseases is being slowly supplanted by non-communicable diseases (NCD). The current estimates indicate that NCD accounts for 53% of total deaths in India and cardiovascular disease (CVD) mortality tops the list of NCD deaths with 45% of NCD deaths accounted for by CVD.1

Heart failure (HF) is a major health burden and is on the rise all over the World.2 The developed nations have identified this as a major health problem and have adopted measures to contain it using the strategies of risk stratification, prevention, education and treatment. In India we do not have even the estimates of HF in our population. This short review intends to examine the epidemiology of HF in India, and potential developments in tackling this health problem

Burden of HF in India

There is a dearth of data regarding incidence or prevalence of HF not only from India, but the whole of the developing world or even outside the United States and Europe.3, 4 The present estimates are extrapolated from the data from the West. The lifetime risk of HF increases with age. With the growing age of population in India, the burden of this problem is bound to rise. The
number of people above 60 years of age in India is projected to increase from 105 million in 2011 (8.4% of total population) to 376 million in 2051 (21.6%).

Attempts have been made to calculate the prevalence of HF in India in 2010 projecting the US rates of prevalence, which provides the estimates as 1.87 percent. Another model, based on disease-specific estimates of prevalence and incidence rates of heart failure estimated the prevalence of HF in India due to coronary heart disease (CHD), hypertension, obesity, diabetes and rheumatic heart disease (RHD) to range from 1.3 to 4.6 million, with an annual incidence of 0.5 -1.8 million. A hospital based study in the United Kingdom observed that the crude annual HF admission rates were higher for South Asian men and women when compared with White men and women respectively. Indo-Asian patients were younger than white patients and had higher rates of CHD and hypertension in that study.

Various cardiovascular risk factors contribute to the development of HF. Follow up of Framingham HF cohort revealed that the prevalence of hypertension in HF patients was 70% in males and 78% in females, that of coronary heart disease (CHD) was 59% and 48% and that of valvular heart diseases in 22% and 31% respectively. A changing trend among the various etiologies in the same cohort was noted, with significant increase in the prevalence of diabetes and CHD and a declining prevalence of hypertension and valvular heart diseases over a period of three decades. The more recent ADHERE registry sums up the increasing recognition of non- ischemic cardiomyopathy as an important contributor – about 47% of acute decompensated HF admissions were due to this entity.

There are no major reports on the causes of HF in India. As early as in 1949, Vakil et al. reported that the primary causes of HF in 1281 patients hospitalized due to HF were represented by hypertension-coronary in 31%, rheumatic heart disease in 29%, and syphilis in 12% and pulmonary diseases in 9%.

The data of patients aged 18 years and above, admitted with acute decompensated HF at the Institute to which the author is affiliated to, in the years 2000 and 2010 were compared (Table 1). CHD and RHD were the top two responsible conditions with the patterns remaining almost the same over the years (unpublished data). In spite of a much lower prevalence of RHD in the adult population(< 1/1000) when compared to CHD (about 10 percent), the contributions of either conditions to HF reflects the propensity of chronic RHD to result in HF. RHD is mentioned as the commonest cause of HF at the All India Institute of Medical Sciences, New Delhi as well.
<table>
<thead>
<tr>
<th>Causes</th>
<th>Year 2000</th>
<th>Year 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronary Heart Disease</td>
<td>38(23.8)</td>
<td>46(28.8)</td>
</tr>
<tr>
<td>Rheumatic Heart disease</td>
<td>49(30.6)</td>
<td>42(26.2)</td>
</tr>
<tr>
<td>Dilated cardiomyopathy</td>
<td>3(1.8)</td>
<td>18(11.3)</td>
</tr>
<tr>
<td>Prosthetic valve complications</td>
<td>17(10.6)</td>
<td>11(6.9)</td>
</tr>
<tr>
<td>Infective endocarditis</td>
<td>7(4.4)</td>
<td>13(8.1)</td>
</tr>
<tr>
<td>Endomyocardial fibrosis</td>
<td>8(5)</td>
<td>8(5)</td>
</tr>
<tr>
<td>Mitral valve prolapse syndrome</td>
<td>3(1.8)</td>
<td>10(6.3)</td>
</tr>
<tr>
<td>Non rheumatic aortic valve disease</td>
<td>4(2.5)</td>
<td>16(10)</td>
</tr>
<tr>
<td>Hypertensive heart disease</td>
<td>5(3.1)</td>
<td>3(1.8)</td>
</tr>
<tr>
<td>PAH</td>
<td>9(5.6)</td>
<td>5(3.1)</td>
</tr>
<tr>
<td>Grown up Congenital heart disease</td>
<td>8(5)</td>
<td>4(2.5)</td>
</tr>
<tr>
<td>HCM and other cardiomyopathies</td>
<td>6(3.8)</td>
<td>7(4.4)</td>
</tr>
<tr>
<td>Others</td>
<td>3(1.8)</td>
<td>4(2.5)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>160</strong></td>
<td><strong>187</strong></td>
</tr>
</tbody>
</table>

(Numbers indicate frequency of each condition and percentage within brackets)

HCM – hypertrophic cardiomyopathy
PAH - Pulmonary artery hypertension; includes various primary and secondary causes, with the
exclusion of any left heart disease. Irreversible pulmonary vascular disease secondary to congenital heart disease is included in PAH group and not in Grown up congenital heart disease group)

There are studies in the west which examine the differences in presentation of HF in migrant Indians and South Asians versus the rest of ethnicities. While the prevalence of HF is similar between the communities, south Asian HF patients tended to be younger, had higher prevalence of CHD, diabetes and had higher re-admissions when compared to whites. They had lesser prevalence of atrial fibrillation and lower age-adjusted mortality.

In addition to RHD and CHD, certain other diseases do contribute significantly to the burden of HF in India, like anemia, infective endocarditis, grown up congenital heart diseases, etc. Endomyocardial fibrosis is a condition, which is more often encountered in certain pockets of the country like south Kerala and significantly impacts the health system of those areas. Pulmonary hypertension and cor pulmonale is a common cause of HF in India, considering the prevalence of valvular heart diseases and chronic obstructive airway diseases (COPD) in the community.

Heart failure with preserved ejection fraction (HFPEF) or diastolic heart failure is an increasingly recognized entity of HF, with significant impact in the morbidity of the elderly. As the population ages, and with the young age escalation of various cardiovascular risk factors and increasing recognition of this condition by the health care providers, the number of patients with this diagnosis is set to increase in the coming years in India. Presently, this entity represents >50% of HF cases in the USA.

**HF in India – the challenges ahead**

Population based screening for undiagnosed HF or asymptomatic ventricular dysfunction is not feasible presently. The diagnosis of HF involves integration of medical history, physical examination and laboratory investigations and many of the patients may be asymptomatic during the early part of the disease. Attempts have been made to use serum levels of B-Natriuretic peptide for screening population 60 years and older for asymptomatic ventricular dysfunction which was successful to an extent. Against this, the initial step of identification of the burden is better initiated at the hospital level itself. Hospital based registries from a region will help to provide data about the etiology, modified history and practice patterns in the region. Rather than single-centre registries, which are likely to have referral bias, these should encompass a group of hospitals which treat HF in a region. Presently, the on-going Trivandrum Heart Failure Registry (THFR) with the support of ICMR (Indian Council for Medical Research) is one such collective venture which intends to obtain data of HF
admissions and short term follow up of such patients in the district.

Heart failure is presently viewed as a continuum, starting from stage A with high risk and no symptoms of HF, progressing to Stage B with asymptomatic structural heart disease, Stage C with structural heart disease with current or previous symptoms and Stage D with refractory symptoms and advanced disease. This concept has been evolved so as to emphasize the importance of preventing heart failure by treating the risk factors or even preventing the risk factors like hypertension, smoking, diabetes etc., i.e., to intervene at the level of stage A itself. This assumes prime importance in India, as the impact of NCD is on the rise along with the age of the population. However, majority of the health care providers including physicians are sensitive to the problem only once overt heart failure sets in, in the form of volume overload and pulmonary venous congestion. To have a meaningful impact in the population, this concept of prevention has to sink in deeply – both at the population level as well as the health care provider level. HF poses a huge burden to the health expenditure, accounting for about 2% of the total health care budget in developed countries. In a country like India where 90% of patients with CHD meet the expenses of treatment on their own, the impact of HF at the population level will be huge.

Aspects of management of patients in stage C and D account for the third challenge. Many of such patients require hospitalization, frequent interactions with health-care providers and periodic counselling. Establishment of dedicated HF programs with clinics and rehabilitation programs will help to provide focused care on such patients. This would also ensure in adherence to the available guidelines and improve clinical outcomes including readmissions.

India has to do a lot to reduce the burden of HF and also provide curative and rehabilitative services to this patient population which will be a huge challenge in the coming decades.

References


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