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Epidemiology of Heart Failure in Asia

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Heart failure (HF) is a global epidemic in health care and a leading cause of mortality and morbidity worldwide. In Asian countries, causes of mortality and morbidity have shifted or have been shifting from infectious diseases and/or nutritional deficiencies to lifestyle-related diseases, such as cardiovascular disease, cancers and diabetes, in conjunction with the transition from developing to developed countries during the past decades (so-called "the epidemiologic transition"). Because the effect of this epidemiologic transition varies among countries, the etiology, prevalence, management and outcomes of HF also differ among the countries. Thus, we need to assemble and comprehensively analyze the available evidence to date for daily HF practice in Asia and to systematically conduct future epidemiologic approaches to establishing appropriate prevention programs against the burden of HF in Asia. This review article will briefly update the epidemiology of HF in Asia. (*Circ J* 2013; **77:** 2209–2217)

Key Words: Epidemiology; Heart failure; Prognosis

Heart failure (HF) is a global epidemic in health care and a leading cause of mortality and morbidity worldwide.[1] For example, approximately 5 million individuals have HF and over 550,000 are newly diagnosed as having HF every year in the United States.[2] However, despite sufficient epidemiologic data in developed countries (mainly in the North America and Europe), there is insufficient information of HF epidemiology in other regions, including Asia. Considering the differences in clinical and social backgrounds and management of HF across geographic regions, we need to assemble the available information regarding HF epidemiology in Asia and make use of it in our daily clinical practice. In this review, we will overview available cohort and epidemiologic studies for HF in Asia, particularly focusing on those from the South, East and South-East Asian countries.

Burden of HF in Asia

In Western and other developed countries, epidemics of obesity, diabetes mellitus (DM) and/or metabolic syndrome have become clinically evident, while the management of ischemic heart disease (IHD) and infection-related heart disease (ie, rheumatic heart disease [RHD]) has improved with the recent progress in medical and public health programs. These epidemics have resulted in a marked increase in cardiovascular disease (CVD) and subsequently HF, a final common pathway of CVD. In Asian countries, the causes of mortality and morbidity have been shifting from infectious diseases and/or nutritional deficiencies to lifestyle-related diseases, such as CVD, cancers, and DM, together with the transition from developing to developed countries during the past decades (so-called "the epidemiologic transition").[3] However, the effect of the epidemiologic transition varies not only among countries but also among regions, communities or ethnicities in the same country, making it difficult to generalize evidence obtained not only from Western countries but also from Asian countries. Considering the relatively younger age of patients with HF and larger population at risk for HF in Asian countries as compared with Western countries, the socioeconomic and clinical effects of HF are estimated to be particularly large in Asia. However, the lack of standard definition of HF and proper surveillance systems makes estimation of the HF burden in Asia difficult.[4]

Prevalence, Incidence and Estimated Number of HF Patients in Asia

There are a limited number of reports regarding the prevalence of HF in Asia (range, 1.26–6.7%).[5–8] A survey of the adult (aged ≥35 years) population in Xinjiang, China (n=8,459), reported that the prevalence of CHF was 1.26% (0.89%, 1.11% and 2.14% in the Han, Uygur and Hazakh populations, respectively), with an increase in the proportion with aging of 0.29%, 0.60%, 1.32%, 2.55% and 4.10% for the 35–44, 45–54, 55–64, 65–74, and ≥75 years age groups, respectively.[5] A single center-based study in Malaysia reported that the prevalence of HF among 1,435 acute medical admissions to the Kuala Lumpur General Hospital over the 4-week study period was 6.7%.[6] The age distribution of HF prevalence was 6.7%, 10.7%, 18.8%, 23.5%, 30.8% and 9.53% for age <40, 40–49, 50–59, 60–69, 70–79 and ≥80 years, respectively, in a hospital-based study in

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Table 1. Characteristics of HF Patients in Asian and Western Studies

Authors	Hamaguchi et al[37]	Kajimoto et al[42]	Shiba et al[25]	Shiba et al[10]	Shiba et al[10]	Shiba et al[10]
Cohort	JCARE-CARD	ATTEND	CHART-1	CHART-2	CHART-2	CHART-2
Registration year	2004–2005	2007–2011	2000–2004	2006–2010	2006–2010	2006–2010
Location, country	164 hospitals, Japan	52 hospitals, Japan	26 hospitals Tohoku district, Japan	24 hospitals Tohoku district, Japan	24 hospitals Tohoku district, Japan	24 hospitals Tohoku district, Japan
HF status	Worsening HF as a primary cause of hospitalization	Acute HF Syndrome	Stable HF	Stage A/B/C/D	Stage B	Stage C/D
No. of patients	2,549	4,841	1,154	10,219	4,654	4,735
Setting	Prospective, multicenter, observational	Prospective, multicenter, observational	Prospective, multicenter, observational	Prospective, multicenter, observational	Prospective, multicenter, observational	Prospective, multicenter, observational
Age, years, mean/median	70.7/–	73.0/–	67.8/–	68.2/–	67.3/–	68.9/–
Male sex, %	60	58	66.5	69.8	71.2	68.4
Etiology						
Coronary artery disease, %	32	31.2	25.3	53.1	51.0	47.1
Cardiomyopathy, %	–	–	–	13.6	10.0	19.5
Dilated cardiomyopathy, %	18.4	12.6	28.1	8.2	3.4	14.4
Hypertrophic cardiomyopathy, %	–	–	–	4	5.6	3.2
Valvular heart disease, %	27.7	19.4	28.1	19.8	19.1	23.8
Hypertensive heart disease, %	24.2	17.7	–	–	–	–
Congenital heart disease, %	–	–	–	–	–	–
Cor pulmonale, %	–	–	–	–	–	–
Comorbidity						
Hypertension, %	52.8	69.1	39.2	77.6	77.8	74.3
Diabetes mellitus, %	30	36.6	19.3	25.3	23.9	23.3
Prior myocardial infarction, %	27	–	–	29.9	31.2	33.8
Atrial fibrillation, %	35.2	–	39.3	–	–	–

ACE, angiotensin-converting enzyme; ARB, angiotensin-receptor blocker; HF, heart failure; RAS, renin-angiotensin system.

(Table 1 continued the next page.)

Hubei Province, China (n=12,450),[9] and 3.1%, 29.0%, 33.7%, and 34.2% for age <40, 40–64, 65–74 and ≥75 years, respectively, in our Chronic Heart Failure Analysis and Registry in the Tohoku District (CHART)-2 Study in Japan (n=10,219).[10]

In Japan, it is estimated that 1.0 million individuals have HF,[11,12] but the number of Japanese outpatients with left ventricular (LV) dysfunction is predicted to gradually increase from 979,000 in 2005 to 1.3 million by 2030.[12] In China, CVD is the leading cause of death and 4.2 million individuals have HF.[13,14] It has also been reported in China that 1.8 million individuals have congenital cardiac abnormalities and 500,000 new cases of HF are diagnosed every year.[15] Unfortunately, there is no reliable estimate in South Asia.[16] Huffman et al reported that the estimated number of patients with HF related to CHD, hypertension (HT), obesity, DM and RHD in 2000 in India ranged from 1.3 to 4.6 million.[17] However, it is also reported that, if the prevalence rate of HF in the USA in 2010 was applied, the prevalence of HF would be 1.87% in India and that the number of HF patients would be 22.7 million if this prevalence rate was applied to the Indian population of 1.21 billion in 2011.[16] Furthermore, Pillai and Ganapathi also estimated that the prevalence of HF is approximately 30 million in South Asia when extrapolating the same prevalence rate to the whole of South Asia (total population of 1.63 billion in 2011).[16] Thus, it is highly possible that Asian countries will experience a further burden of HF, requiring systematic approaches to surmount this epidemic.

Etiology and Baseline Characteristics of HF Patients in Asia

During the past decades, the epidemiologic transition has occurred in Asia in conjunction with aging of the population and changes in lifestyle.[8,16] Table 1 is a comparison of the etiology and comorbidity of HF among representative studies in East Asian,[5–7,9,18–43] Asian-Pacific,[44] and Western populations.[45–48] In general, patients registered were relatively younger in China and Malaysia as compared with Japan, Taiwan and Korea

Authors	Youn et al[10]	Tseng CH[21]	Yin et al[19]	Yu et al[9]	Chong et al[6]	Atherton et al[44]	Atherton et al[44]	Nieminen et al[48]
Cohort	KorHF					ADHERE-AP	ADHERE	EHFS II
Registration year	2004–2009	2005	1993–2007	2000–2010	NA	2006–2008	2005–2006	2004–2005
Location, country	Korea	Taiwan	Single center, Beijing, China	12 hospitals Hubei Province, China	Single center, Kuala Lumpur, Malaysia	43 hospitals, 8 Asia-Pacific countries	307 hospitals, USA	133 hospitals, 30 European countries
HF status	Hospitalized HF (survivor), LVEF <40%	ICD-9-CM	ICD-9-CM	NA	NA	Acute decompensated HF	Acute decompensated HF	Acute HF
No. of patients	1,527	2,692	6,949	12,450	97	10,171	17,382	3,580
Setting	Prospective, multicenter, observational	Retrospective, random sampling of insurants (n=1,000,000)	Retrospective, review of hospital records	Retrospective, multicenter	Retrospective, screening of acute admissions (n=1,435)	Prospective, multicenter, observational	Prospective, multicenter, observational	Prospective, multicenter, observational
Age, years, mean/median	69/–	73.1/–	60.1/–	62.0/–	63.6	67/66	75/–	69.9/–
Male sex, %	56	54.5	62.7	57.6	62.9	57	49	61.3
Etiology								
Coronary artery disease, %	40.1	31.5	45	28.2	49.5	50	57	53.6
Cardiomyopathy, %	21.9	–	7.42	–	–	–	–	–
Dilated cardiomyopathy, %	–	–	–	26.6	4.1	–	–	19.3
Hypertrophic cardiomyopathy, %	–	–	–	–	–	–	–	–
Valvular heart disease, %	10.7	–	27.5	17.5 (rheumatic)	4.1	–	–	34.4
Hypertensive heart disease, %	–	–	–	–	18.6	–	–	–
Congenital heart disease, %	–	–	3.2	–	–	–	–	–
Cor pulmonale, %	–	–	9.61	–	–	–	–	–
Comorbidity								
Hypertension, %	42	38.9	38.7	31.5	49.5	64	77	62.5
Diabetes mellitus, %	31.4	28.1	18.3	–	28.9	45	45	32.8
Prior myocardial infarction, %	15.4	–	12.8	–	–	–	–	–
Atrial fibrillation, %	20.8	–	23.2	–	4.1	24	31	38.7

(Table 1). In the ADHERE-AP (Asian-Pacific) Study, it was reported that patients registered in South-East Asia were generally younger (median age: 53, 60, 61, 67 and 71 years for Philippines, Indonesia, Malaysia, Thailand and Singapore, respectively) as compared with those in East Asia (median age: 77 years for both Hong Kong and Taiwan) and in Australia (median age: 77 years).[44] It also has been demonstrated that patients who develop HF are relatively younger in South Asia, although scant information is available.[16] A report in 2008 from a single center in Pakistan reported that the mean age of HF patients (n=276) was 54.4 years,[49] compared with a mean age of 73.1±13.9 years in 500,000 US patients[50] and 68.2±12.3 years in 10,219 Japanese patients registered in the CHART-2 study.[10] Accordingly, HF patients are generally younger in China and South/South-East Asian countries as compared with those in East Asian and Western countries. Among the studies, the prevalence of male sex ranged between 50% and 70%, which was consistent with the Western studies (Table 1).

As the underlying etiology of HF in East and South-East Asia, coronary artery disease (CAD) had the highest prevalence, ranging from 28.2% to 53.1%, followed by valvular heart disease (VHD) and cardiomyopathy in China,[5,9,18–20] Malaysia,[6] Taiwan,[21] Hong Kong,[22,23] South Korea,[24] and Japan.[10,25–43] The prevalence of VHD ranged from 10.7% to 27.5% of HF patients in most countries except Malaysia, where the prevalence of VHD was relatively low as compared with that of the Euro-Heart Failure Survey II (EHFS II).[6] As a comorbidity, the prevalence of HT was highest, with a wide range from 31.5% to 77.8% in China,[5,9,18–20] Taiwan,[21] Hong Kong,[23] Malaysia,[6] and Japan.[10,25–43] In contrast, the prevalence of DM in Asia was 18.3–45.0%.[5–8,16–35]

In South Asia, in addition to CAD and HT, RHD is a major contributor to HF.[16] Although there are few major studies, a small study from India in 1999 (n=125) reported that RHD was the commonest underlying heart disease (52.8%), followed by ischemic and/or hypertensive heart disease (27.2%).[24] On the other hand, a study from Pakistan reported in 2007 that 77% was related to IHD among 196 HF patients with systolic HF.[25]

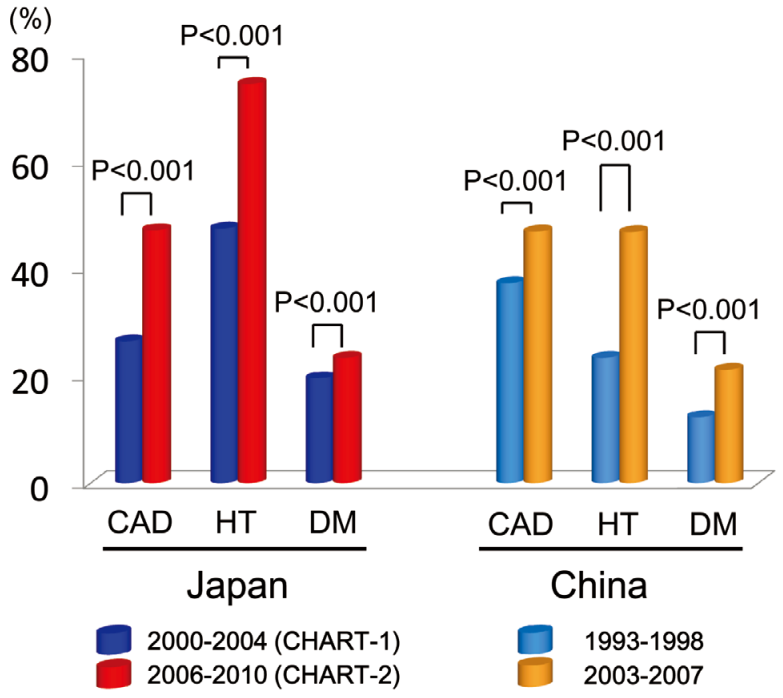

Figure 1. Recent trend towards ischemic etiology for heart failure in Asia. In both Japan (CHART studies)[10] and China,[18] the prevalence of coronary artery disease (CAD), hypertension (HT) and diabetes (DM) increased as a cause or comorbidity of heart failure.

In India, it is estimated that the number of patients aged 5–40 years with RHD at higher risk for HF development is at least 1.4 million,[51] although the incidence or prevalence of HF in RHD is unknown. Furthermore, the estimated number of children (0–15 years) with established congenital heart disease is 1.41 million in India, assuming an incidence of 4/1,000 live births for congenital heart diseases.[51] Because the risk of HF in patients with congenital heart disease increases with age, these estimates indicate that the number of adult patients with congenital heart disease is apparently huge in India, warranting a caution for a further burden of HF.[52] In addition, in India, the prevalence of chronic obstructive pulmonary disease (COPD) is 4.1% in adult subjects aged ≥35 years.[53] Considering the high prevalence of RHD, congenital heart disease and COPD in South Asia, it is highly possible that a considerable number of patients suffer from pulmonary hypertension and develop HF in this region.

Burden of Ischemic Etiology of HF in Asia

In North America, an increase in ischemic HF after acute myocardial infarction has been reported.[54,55] Our recent studies have also revealed an increasing trend towards ischemic etiology and comorbidities with DM and HT in Japanese HF patients.[10] The CHART-1 study, which enrolled 1,278 consecutive stable CHF patients between 2000 and 2005, revealed that the most prevalent etiology of HF was non-ischemic cardiomyopathy (28.6%) and CAD accounted for 25.4% of the total HF patients.[10,24–27] This prevalence of ischemic HF was considerably low as compared with Western studies.[45–48] In contrast, the CHART-2 study, which enrolled 10,219 consecutive patients with symptomatic HF, structural heart disease without HF and CAD between 2006 and 2010,[10,29–31] revealed that the prevalence of CAD, HT and DM in Stage C/D HF patients (n=4,735) increased to 47.1%, 74.3%, and 23.3%, respectively, demonstrating the rapid trend of westernization of etiology and clinical characteristics of HF patients in Japan (Figure 1).[10] A report from the Chinese People's Liberation Army General Hospital in Beijing, China, also showed that the prevalence of CAD, HT, and DM were increased in patients with HF from 37.2%, 23.3%, and 12.3% in 1993–1998 to 46.8%, 46.7%, and 21.1% in 2003–2007, respectively.[18] These lines of evidence suggest a burden of ischemic etiology for HF in East Asia (Figure 1).[8] In South Asia, it is also possible that etiologies of HF have changed during the past several decades, but there is little information available.[16]

HF With Preserved Ejection Fraction in Asia

Recently, HF with preserved ejection fraction (HFpEF) was recognized as a new entity of HF.[56,57] It was previously considered that HFpEF accounted for less than half of HF cases, mainly based on reports derived from hospitalized HF studies.[34,56] However, together with acceptance of the concept and definition of HFpEF, as well as an actual increase in the prevalence of HFpEF over time,[57] it is currently recognized that HFpEF represents more than half of HF patients in Japan[10,29] and Western countries.[58–60] In our CHART-2 Study, the prevalence of HFpEF, defined as Stage C/D HF patients with LV ejection fraction (LVEF) ≥50% was 65.2% (3,086 of 4,735).[29] Owan et al[57] examined consecutive patients hospitalized with decompensated HF at Mayo Clinic Hospitals in Olmsted County, Minnesota, USA, from 1987 through 2001. They found that the proportion of HFpEF cases increased over time, from 38% in 1986–1990 to 54% in 1996–2001.[57] This increase in HFpEF could be explained, at least in part, by a trend in the epidemiologic transition, as HFpEF patients are generally characterized by higher age, more females and a history of HT or atrial fibrillation and a lower prevalence of CAD,[29,34,56–60] all of which are highlighted during the epidemiologic transition. Thus, it is highly possible that the prevalence of HFpEF is also increasing in Asian countries, despite a lack of precise epidemiologic

Table 2. Prevalence of Medical Treatment of HF Patients in Asian and Western Studies

Authors	Hamaguchi et al[37]	Kajimoto et al[42]	Shiba et al[25]	Shiba et al[10]	Shiba et al[10]	Shiba et al[10]
Cohort	JCARE-CARD	ATTEND	CHART-1	CHART-2	CHART-2	CHART-2
Registration year	2004–2005	2007–2011	2000–2004	2006–2010	2006–2010	2006–2010
Location, country	164 hospitals, Japan	52 hospitals, Japan	26 hospitals Tohoku district, Japan	24 hospitals Tohoku district, Japan	24 hospitals Tohoku district, Japan	24 hospitals Tohoku district, Japan
HF status	Worsening HF	ADHF	Stable HF	Stage A/B/C/D	Stage B	Stage C/D
No. of patients	2,549	4,841	1,154	10,219	4,654	4,735
RAS inhibitor, %	76.5	–	69.1	67.4	62.8	72.3
ACEI, %	37.4	14.5	–	34.9	28.1	44.6
ARB, %	44.4	34.6	–	33.6	35.9	31.8
β-blocker, %	48.6	33.4	24.7	40.4	34.2	49.0
Diuretic, %	–	–	–	32.6	16.6	52.9
Aldosterone antagonist, %	41.6	19.5	–	–	–	–
Calcium-channel blocker, %	25.2	28.6	–	45.3	48.1	38.7
Digitalis, %	30.9	12.6	–	15.9	10.4	23.5

*Limited to discharged patients.
ADHF, acute decompensated heart failure. Other abbreviations as in Table 1.

Authors	Youn et al[24]	Tseng CH[21]	Yu et al[9]	Atherton et al[44]	Atherton et al[44]	Nieminen et al[48]
Cohort	KorHF			ADHERE-AP	ADHERE	EHFS II
Registration year	2004–2009	2005	2000–2010	2006–2008	2005–2006	2004–2005
Location, country	Korea	Taiwan	12 hospitals, Hubei Province, China	43 hospitals, 8 Asia-Pacific countries	307 hospitals, USA	133 hospitals, 30 European countries
HF status	*Hospitalized HF, LVEF <40%	ICD-9-CM	NA	ADHF	ADHF	Acute HF
No. of patients	1,527	2,692	12,450	10,171	17,382	3,580
RAS inhibitor, %	68.0	50.8	–	63	67	80
ACEI, %	45.6	–	50.7	–	–	–
ARB, %	24.5	–	–	–	–	–
β-blocker, %	40.9	25.4	44.1	41	74	61
Diuretic, %	–	76.3	68.8	–	–	–
Aldosterone antagonist, %	37.5	–	–	–	–	–
Calcium-channel blocker, %	–	29.3	–	–	–	–
Digitalis, %	–	32.4	47.5	34	26	31

data. Indeed, elderly, female and/or hypertensive HFpEF patients would be one of the main therapeutic targets in Asia in the near future.

Management of HF Patients

Table 2 summarizes the drug treatments in representative HF studies in Asia. Diuretics were the most commonly used medication, followed by renin-angiotensin system (RAS) inhibitors and β-blockers. The prevalence of angiotensin-converting enzyme inhibitor (ACEI) and angiotensin II receptor blocker (ARB) use was almost comparable. The prevalence of treatment with β-blocker varied among Japan, China, Taiwan, and Malaysia, with the highest percentage in Japan (49%) and the lowest in Malaysia (9.3%). In the CHART studies, both the usage of RAS inhibitors and β-blockers for Stage C/D HF patients increased from 2000–2005 to 2006–2010, while that of loop diuretics and digitalis decreased (Figure 2).[10] In South Asian countries, the most commonly used medications are β-blockers, ACEI/ARB, diuretics and aldosterone antagonists,[16] although there are few reliable data.

Implantable cardioverter defibrillators (ICD) and/or cardiac resynchronization therapy (CRT) are indicated for patients with chronic HF to prevent sudden cardiac death and/or improve LV function. However, both therapies are likely under-used in Asian countries, particularly in South Asia, because of limitations of accessibility and affordability. Although data from reliable, large-scale studies are scarce in Asia, 2.9% of Stage C and 15.8% of Stage D patients with HF had received ICD and/or CRT at the time of registration in our CHART-2 Study and are currently being followed up.[10]

Clinical Outcomes of HF Patients in Asia

Table 3 summarizes the clinical outcomes of HF patients in Asia. As for acute decompensated heart failure (ADHF), the ATTEND Registry (n=4,841) revealed that the in-hospital mortality rate was 6.4% (n=311), with 218 cardiac (70%) and

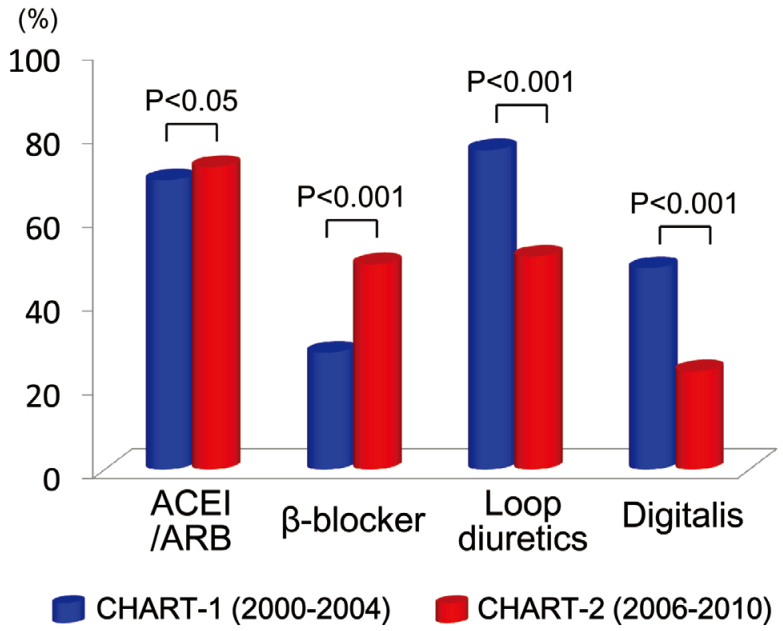

Figure 2. Recent trend in medication for patients with heart failure in Japan. In the CHART studies conducted in Japan, the prescription of angiotensin-converting enzyme inhibitor (ACEI)/angiotensin-receptor blocker (ARB) and β-blockers for Stage C/D HF patients increased from 2000–2005 to 2006–2010, whereas that of loop diuretics and digitalis decreased.[10]

Table 3. Clinical Outcomes of HF Patients in Asian and Western Studies

Authors	Tsuchihashi-Makaya et al[34]	Tsuchihashi-Makaya et al[34]	Kajimoto et al[42]	Nochioka et al[30]	Shiba et al[10]	Miura et al[29]
Cohort	JCARE-CARD	JCARE-CARD	ATTEND	CHART-2	CHART-2	CHART-2
Registration year	2004–2005	2004–2005	2007–2011	2006–2010	2006–2010	2006–2010
Location, country	164 hospitals, Japan	164 hospitals, Japan	52 hospitals, Japan	24 hospitals Tohoku district, Japan	24 hospitals Tohoku district, Japan	24 hospitals Tohoku district, Japan
HF status	Hospitalized HF, EF <40%	Hospitalized HF, EF ≥50%	ADHF	Stage B	Stage C/D	Stage C/D, EF ≥50%
No. of patients	985	429	4,841	3,421	4,736	2,465
In-hospital mortality, %	3.9	6.5	6.4	NA	NA	NA
Mortality at 1 year, %	11:4*	11.6*	NA	1.5†	4.2†	2.8†
Readmission because of HF at 1 year, %	23.7*	25.7*	NA	3.3†	14.3†	NA

*Limited to discharged patients. †calculated for this review.
Abbreviations as in Tables 1,2.

Authors	Youn et al[24]	Tseng CH[21]	Yin et al[19]	Chong et al[6]	Atherton et al[44]	Atherton et al[44]	Nieminen et al[48]
Cohort	KorHF				ADHERE-AP	ADHERE	EHFS II
Registration year	2004–2009	2005	1993–2007	NA	2006–2008	2005–2006	2004–2005
Location, country	Korea	Taiwan	Single center, Beijing, China	Single center, Kuala Lumpur, Malaysia	43 hospitals, 8 Asia-Pacific countries	307 hospitals, USA	133 hospitals, 30 European countries
HF status	Hospitalized HF LVEF <40%	ICD-9-CM	ICD-9-CM	NA	Acute decompensated HF	Acute decompensated HF	Acute HF
No. of patients	1,636	2,692	6,949	97	10,171	17,382	3,580
In-hospital mortality, %	6.6	3.9	5.4	5.2	4.8	3	6.7
Mortality at 1 year, %	9.2*	NA	NA	NA	NA	NA	NA
Readmission because of HF at 1 year, %	9.8*	NA	NA	NA	NA	NA	NA

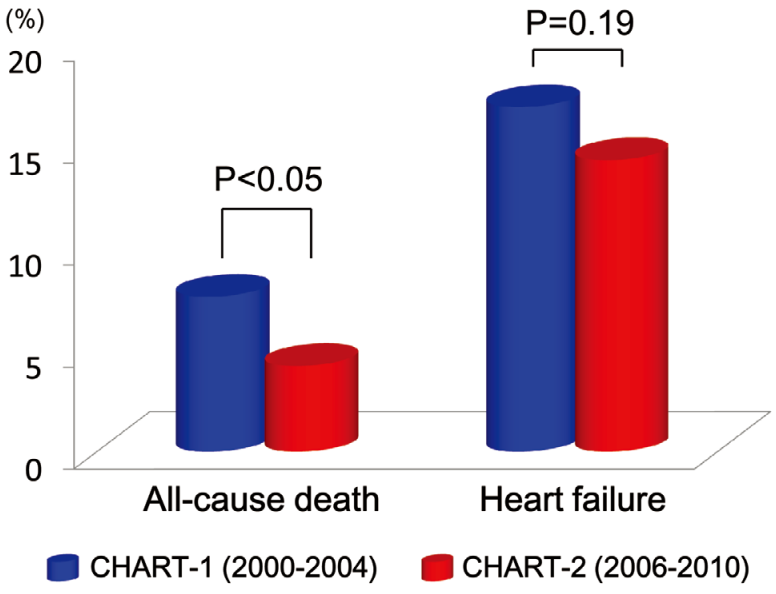

Figure 3. Incidence of all-cause death and heart failure in the CHART studies. Incidence of all-cause death and heart failure (HF) requiring hospitalization at 1 year was calculated for this review using the same cohort of Stage C/D HF patients reported by Nochioka et al (CHART-1)[28] and Shiba et al (CHART-2).[10] Incidence of all-cause death significantly and that of HF insignificantly decreased from CHART-1 to CHART-2.

93 non-cardiac deaths (30%),[42] which was almost comparable with that in the EuroHeart Failure Survey II (6.7%),[48] but slightly higher than in the ADHERE (4.0%) and OPTIMIZE-HF (3.8%) Studies.[45–47] In the Korean Heart Failure Registry (KorHF), in-hospital mortality was 6.6% among 1,653 hospitalized HF patients with LVEF <40% determined by echocardiography.[24] In a report from a single center in Beijing, China (n=7,319), the 30-day hospitalized mortality was 5.1% in 2003–2007, which had decreased significantly from 7.0% in 1993–1997.[16] The 1-year mortality of outpatients with HF varies from 3.6% to 17.1% (**Table 3**). As shown in **Figure 3**, the 1-year incidence of all-cause death significantly and that of HF requiring hospitalization insignificantly decreased from 2000–2004 to 2006–2010 in the CHART studies in Japan.[10,28] In Singapore, mortality from HF decreased from 7.3/10,000 in 1991 to 6.1/10,000 in 1998, with Indians and Malays having a worse outcome than Chinese, highlighting an ethnic difference in the same country.[7]

Prevention of HF in Asia

The American Heart Association (AHA) and the American College of Cardiology (ACC) Guidelines underscore the importance of early detection and treatment of patients at high risk for progression to symptomatic HF.[62] The AHA/ACC Guidelines classify asymptomatic subjects with structural and/or functional heart disease as Stage B, which is a category that is strongly associated with future development of HF.[63] Thus, the management of Stage B HF patients is important to prevent or better manage the risk factors for HF, such as HT, DM, smoking, obesity and other lifestyle-related diseases. Because the prevalence of these lifestyle-related diseases has been increasing in Asian countries,[66] management of these factors by lifestyle modification and medications are important. In particular, programs including diet, exercise, restriction of salt intake as well as medications are important to better manage HF patients with HT and DM. Indeed, several randomized clinical trials demonstrated that reduction in blood pressure with antihypertensive agents was associated with an absolute risk reduction in the incidence of HF,[64–66] whereas DM was associated with an increased risk of symptomatic HF.[67] In addition, early detection and management of RHD, congenital heart disease or pulmonary HT is important, particularly in South Asia. Improvement of affordability and accessibility are also important social issues to be addressed in Asia. Indeed, the ADHERE international study reported that patients hospitalized with ADHF in the Asia-Pacific region tended to present with more severe clinical symptoms and signs and are younger, especially in countries at an earlier stage in their epidemiological transition.[61] In these countries, it was reported that echocardiography and disease-modifying medications were less used, highlighting potential opportunities to improve outcomes.[61]

Conclusions

HF is a leading cause of mortality and morbidity in Asia. Because the causes of mortality and morbidity have shifted from infectious diseases and/or nutritional deficiencies to lifestyle-related diseases during the epidemiologic transition, it is highly possible that HF patients would further increase in Asia. To date, however, there is insufficient information available on HF epidemiology in Asia. Thus, we need to assemble and comprehensively analyze the available evidence in Asia to inform our daily clinical practice and to systematically conduct future epidemiologic approaches to establishing appropriate prevention programs against the burden of HF in Asia.

Disclosures

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