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Clinical Characteristics and Outcome of Hospitalized Patients With Heart Failure in Japan

—— Rationale and Design of Japanese Cardiac Registry of Heart Failure in Cardiology (JCARE-CARD) ——

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Background Heart failure (HF), defined as a complex clinical syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the ventricle to fill with or eject blood, is a leading cause of mortality and hospitalization for adults older than 65 years in the industrialized countries. The characteristics and outcome of patients with HF have been described by several epidemiological studies and large scale clinical trials, performed mainly in the United States and Europe. Very little information is available on this issue in Japan.
Methods and Results The Japanese Cardiac Registry of Heart Failure in Cardiology (JCARE-CARD) is designed to prospectively study the characteristics, treatment, and outcomes of a broad sample of patients hospitalized with HF at teaching hospitals throughout Japan between January 2004 to June 2005 and the outcomes, including death and hospital readmission, will be followed through 2006 (mean follow-up at least 1 year). Participating cardiologists identify patients admitted for worsening of HF symptoms. Demographics, medical history, severity, treatment, and outcome data are collected and entered into a database via secure web browser technology. As of June 2005, baseline data for 2,676 patients with HF have been registered from 164 participating hospitals.
Conclusions The JCARE-CARD will provide important insights into the management of patients with HF in routine clinical practice in Japan, thus providing the framework for improved management strategies for these patients. (*Circ J* 2006; **70:** 1617–1623)

Key Words: Heart failure; Management; Outcome; Registry

Heart failure (HF) is defined as a complex clinical syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the ventricle to fill with or eject blood, according to the guidelines for the diagnosis and treatment of chronic heart failure of American College of Cardiology/American Heart Association and European Society of Cardiology (ESC)[1,2] The manifestations of HF are dyspnea and fatigue, which may limit exercise tolerance, and fluid retention, which may lead to pulmonary congestion and peripheral edema[1,2] HF is a leading cause of morbidity and mortality in the industrialized countries[3] and is a growing public health problem, mainly because of the aging of the population and the increased prevalence of HF in the elderly[4] The clinical characteristics, treatment, and outcome of these patients have been well described by a number of both community-based[5–7] and hospital-based studies[8–11] as well as by clinical trials of HF treatment[12–14] However, information derived from clinical trials is not necessarily representative of "real world" patients with HF and, moreover, these studies have been performed mainly in the United States and Europe.

Very limited information is available on the characteristics and outcome of patients with HF in Japan[15–17] Our previous studies were the first detailed analysis of the clinical characteristics, management, and outcome, including mortality and HF-related readmission, in Japan[18–20] They demonstrated that HF patients were elderly, comprised more women, especially at higher ages, and had a higher incidence of overt HF despite a relatively normal ejection fraction (EF). As many as 35% of hospitalized patients with HF were readmitted within 1 year of hospital discharge. These characteristics are consistent with those of patient populations in community-based studies reported previously[21,22]

The Japanese Cardiac Registry of Heart Failure in Cardiology (JCARE-CARD) has been developed to provide a national prospective registry database describing the clinical characteristics, treatment, and outcomes of patients hospitalized for worsening of HF symptoms. It will also establish the framework for future initiatives to improve the outcomes of these patients. Specifically, this study aimed to determine the influence of clinical characteristics on patient outcomes and further identify the predictive risk of adverse outcomes. This report presents a detailed de-

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Table 1 Framingham Criteria for Heart Failure (HF)

Major criteria
Paroxysmal nocturnal dyspnea
Neck vein distension
Rales
Radiographic cardiomegaly (increased heart size on chest X-ray)
Acute pulmonary edema
S3 gallop
Increased central venous pressure (>16cm water at right atrium)
Circulation time ≥25 s
Hepatojugular reflux
Pulmonary edema, visceral congestion, or cardiomegaly at autopsy
Minor criteria
Bilateral ankle edema
Nocturnal cough
Dyspnea on ordinary exertion
Hepatomegaly
Pleural effusion
Decrease in vital capacity by one-third from maximum value recorded
Tachycardia (rate ≥120 beats/min)
Major or minor criteria
Weight loss ≥4.5 kg in 5 days in response to treatment

The diagnosis of HF was established by the simultaneous presence of at least 2 major criteria or 1 major criterion in conjunction with 2 minor criteria.

scription of the rationale and design of JCARE-CARD.

Methods

Study Design

JCARE-CARD is a multicenter registry designed to compile a large clinical database on the characteristics, management, and outcomes of patients hospitalized for the worsening of HF in Japan. Baseline data are collected during the episode of index hospitalization from January 2004 to June 2005. Follow-up data will be collected at least 1 year after the index admission.

Study Objectives

The specific objectives of the JCARE-CARD include the following: (1) to describe the demographic and clinical characteristics of patients hospitalized with HF in Japan; (2) to describe the in-hospital and long-term outcomes; and (3) to identify the factors, including specific treatments, associated with improved or worsened outcomes.

Study Hospitals

The study hospitals include the cardiology units serving as primary, secondary, and tertiary referral medical centers for cardiovascular patients across Japan. They are authorized as teaching hospitals by the Japanese Circulation Society.

Study Patients

For this registry, HF is defined as a complex clinical syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the ventricle to fill with or eject blood. The presence of HF is confirmed by using the Framingham criteria (Table 1).[5] Patients readmitted to hospital during the study period are included only by the first hospitalization (index admission). Patients must be at least 15 years old at the time of hospital admission. Eligibility is not contingent on the use of any particular therapeutic agent or regimen.

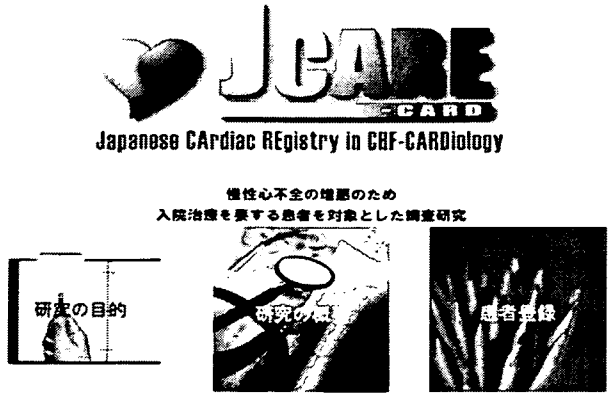

Fig 1. Screen-shot of the top page of the Japanese Cardiac Registry of Heart Failure in Cardiology (JCARE-CARD) web site (www.jcare-card.jp).

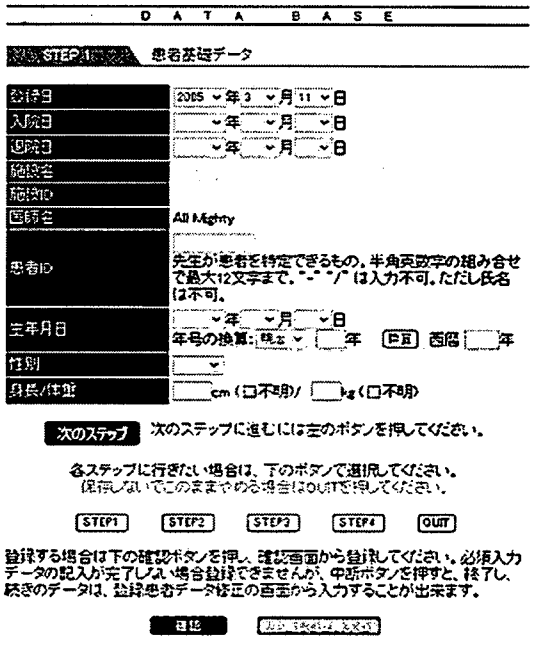

Fig 2. Sample screen-shot of a page of the electronic case report form with sample pull-down menus from the Japanese Cardiac Registry of Heart Failure in Cardiology web site (www.jcare-card.jp).

Data Collection and Processing

Data are entered using a web-based electronic data capture (EDC) system licensed by the JCARE-CARD (www.jcare-card.jp). The EDC system was chosen because of perceived advantages over the traditional, paper-based data entry process, including the ability to inform participating hospitals of missing or illogical data fields at the time of data submission. A study web site has been created with a public area providing general information regarding this study and a registry-site-only area that provides information concerning data registry (Figs 1,2). The study hospitals are encouraged to register the patients as consecutively as possible. The diagnosis of HF is established by the simultaneous presence of at least 2 major criteria or 1 major criterion in conjunction with 2 minor criteria of the Framingham criteria (Table 1). Compliance with these

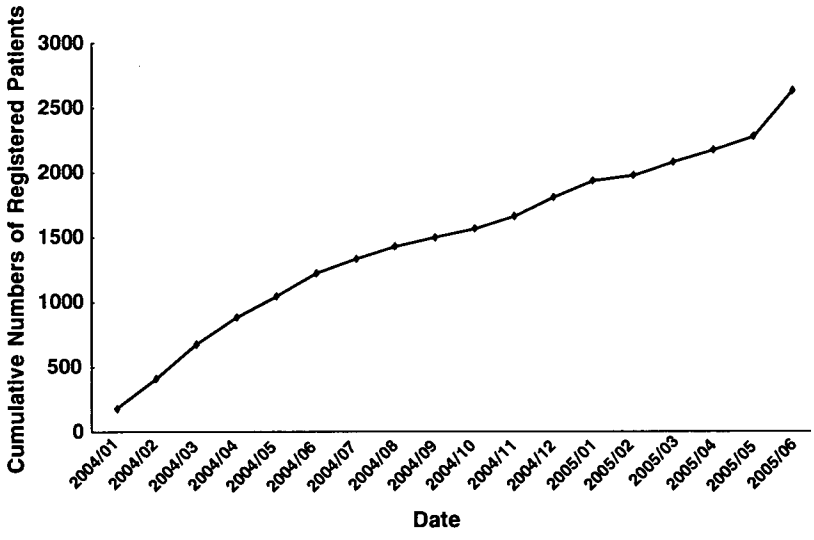

Fig 3. The Japanese Cardiac Registry of Heart Failure in Cardiology cumulative number of registered patients from January 2004 to June 2005.

methods of registry is not strictly monitored.

For each case, baseline data recorded on the form include (1) demography; (2) cause of HF; (3) precipitating cause; (4) comorbidities; (5) complications; (6) clinical status; (7) electrocardiographic and echocardiographic findings; and (8) treatment including discharge medications.

The status of all patients is surveyed at least 1 year after admission and the following information is obtained: (1) survival, (2) cause of death, and (3) hospital readmission because of exacerbation of HF that required more than continuation of the usual therapy on prior admission.

Patient Confidentiality

The JCARE-CARD protocol was organized to ensure compliance with the Guidelines for the Epidemiological Research published by the Japanese Ministry of Health, Labour and Welfare. The original study protocol was approved by the Institutional review board (IRB) at Kyushu University. IRB approval from each participating hospital is also required for participation in this registry. Informed consent is given by each patient. The study does not include any protocol-specified alteration of treatment or any other aspect of hospital care. Patient confidentiality is preserved because direct patient identifiers, such as name, address, and identification number, are not collected. Access to the EDC system at each hospital is carefully controlled by the data management office.

Statistical Analysis

Descriptive statistics are used to summarize baseline characteristics, treatment, and outcomes for the patients and for specific subgroups of interest.

Results

The JCARE-CARD enrolled HF patients from January 2004 to June 2005. As of June 2005, baseline data on 2,676 patients with HF have been registered from 164 participating hospitals (Fig 3, Table 2).

Table 2 Number of Participating Hospitals and Registered Patients Among 8 Regions in Japan

Region	*No. of participating hospitals*	*No. of registered patients*
Hokkaido	*8*	*143*
Tohoku	*7*	*140*
Kanto	*44*	*728*
Hokuriku	*10*	*55*
Tokai	*20*	*499*
Kinki	*31*	*491*
Chugoku · Shikoku	*18*	*239*
Kyushu	*26*	*381*
Total	*164*	*2,676*

Discussion

The characteristics and outcomes of Japanese patients with HF are poorly defined despite the public health importance of this disease. The JCARE-CARD, which aimed to better characterize this population, is the first diverse, large-scale, prospective multicenter database of patients hospitalized for HF in Japan.

We have previously reported the characteristics and outcomes of patients admitted to urban cardiology departments in Fukuoka, Japan.[18–20] Those studies highlighted several important features of Japanese patients with HF. One key feature was their advanced age: the mean age of HF patients was 69 years (70% were ≥65 years of age). In particular, women were mostly over 70 years of age, which is consistent with results from previous community-based studies.[21,22] Another important feature was the high proportion of patients with relatively preserved EF; that is, half of the patients with definite HF who had echocardiography had normal EF (≥50 %), indicating the contribution of diastolic dysfunction in the pathogenesis of HF.[20] A most interesting and important finding was a relatively good survival prognosis for the study patients; the 1-year mortality rate was 8.3 %. Survival prognosis for patients with decreased EF (<40%) was still good; their 1-year mortality rate was 9.1%. At the first glance, this finding appears to contradict the generally held notion that advanced age and more comorbidity are related to poor survival.[18] In contrast to the relatively low mortality, rates of readmission for HF were as high as 40% within 1 year after discharge. This is comparable to the rates found in prior studies (3–6-month readmission rate of 30–50%);[23,24] and the most commonly identified cause for hospital readmission was lack of compliance with

medical and dietary treatment (48%)![19]

Even though our previous studies gave a valuable insight into the clinical characteristics, outcomes, and the potential effective treatment strategies for HF patients in Japan;[18–20] generalization of these results is questioned because our investigation involved a small number of patients (n=230). Therefore, it is of critical importance to analyze the data of HF patients in routine clinical practice on a national basis and to form a database for future investigations. For this purpose, JCARE-CARD is designed to focus on the demographic and clinical characteristics, treatment strategies, and outcomes of patients admitted to hospitals throughout Japan. It is important to consider the JCARE-CARD in the context of other large-scale databases such as the Acute Decompensated Heart Failure National Registry (ADHERE) or EuroHeart that have been established to evaluate epidemiologic and clinical aspects of HF[8,10,11] These administrative data sets have provided important insights concerning the prognostic and public health role of a number of classic epidemiologic factors, as well as information on medication use. The JCARE-CARD is expected to provide us with important information regarding the characteristics, treatment, and outcomes of HF patients in Japan, which may be complementary to that gathered from the studies in Europe and the USA. This information is often critical to our understanding of the clinical characteristics of HF, including independent prognostic predictors.

There have been 2 large-scale registries of HF reported: the EuroHeart Failure Survey from Europe and ADHERE from the USA. The EuroHeart Failure Survey registered 11,304 HF patients in departments of cardiology, cardiovascular surgery, general internal medicine and geriatrics at 115 hospitals, including both general hospitals and university centers from 24 ESC member countries over a 6-week period during March 2000 and May 2001![9–11] Patients were enrolled as HF if they fulfilled at least 1 of the following criteria: (1) clinical diagnosis of HF during the admission; (2) diagnosis of HF recorded at any time in the last 3 years; (3) administration of a loop diuretic for any reason other than renal failure during the 24 h prior to death or discharge; (4) pharmacological treatment for HF or ventricular dysfunction within 24 h of death or discharge. The Euro Heart Failure Survey described the quality of care, and the diagnostic and therapeutic management of patients with HF in Europe. Outcome was further assessed by repeat interviews in 6–12 months![25,26]

The ADHERE is a registry designed to study the characteristics, management, and outcomes in a broad sample of patients hospitalized with acute decompensated HF throughout the USA![8] Participating hospitals identify patients with a primary or secondary discharge diagnosis of HF. Medical history, management, treatment, and outcome data are collected through review of medical records and entered into a database via secure web browser technology. Of available data (105,388 patients from 274 hospitals), the mean age was 72.4 years old, and 52% were women. The most common comorbid conditions were hypertension (73%), coronary artery disease (57%), and diabetes (44%). Evidence of mild or no impairment of systolic function was found in 46% of patients. In-hospital mortality was 4.0%. The ADHERE data provided important insights into the clinical characteristics and patterns of care of these patients. Similar to our previous studies![20] the ADHERE demonstrated that many patients hospitalized with HF had mild or no impairment of systolic ventricular function![27] These registry data demonstrate significant differences in the definition of HF between patients hospitalized for HF and those enrolled in randomized clinical trials![28]

Even though JCARE-CARD and ADHERE share many similarities in their design and rationale, there are several important differences between them. Follow-up data were not obtained in the ADHERE, so the subsequent clinical outcomes, including death and readmission of patients after the index hospitalization, are unknown. Data are gathered retrospectively after hospital discharge in the ADHERE, which may preclude prospective analysis of particular treatments in these patients.

Study Limitations

Several crucial limitations inherent in the design of the JCARE-CARD should be considered. First, the data are based on the decisions made by the participating cardiologists. The lack of a precise, universal definition of HF makes this type of registry open to many criticisms. However, it is not the objective of this survey to restrict enrollment to the narrowly defined population of HF usually included in clinical trials, but rather to include a broad range of patients reflecting the current reality of clinical practice. All participating hospitals are authorized as teaching hospitals by the Japanese Circulation Society. In addition, the information regarding the study protocol was regularly provided at national as well as local meetings and also via monthly e-mail notice. Second, this survey relies on the hospitals to volunteer their support, which almost certainly biased the study towards larger centers that can support research staff. In addition, we excluded specialist wards other than cardiology from this survey.

Conclusions

The JCARE-CARD will be the first survey to provide valuable information on current patient characteristics, management, and outcomes in a broad sample of Japanese patients who are hospitalized with HF as routine clinical practice. These data may indicate that there are substantial opportunities to improve the management of these patients. By helping to better characterize this disease state, it will ultimately have a significant impact on public health at the national level in Japan.

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Appendix 1

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Appendix 3

Patient Data Form for JCARE-CARD

Step 1. Demographic Data

1. Date of registry
2. Date of admission
3. Date of discharge
4. Date of birth
5. Age
6. Sex
7. Height
8. Body weight
9. Body mass index

Step 2. Clinical Data (Medical History)

1. Causes of heart failure
   1. Ischemic
   2. Hypertensive
   3. Cardiomyopathic, dilated
   4. Cardiomyopathic, hypertrophic
   5. Cardiomyopathic, dilated phase of hypertrophic cardiomyopathy
   6. Valvular heart disease
   7. Congenital heart disease
   8. Others
   9. Unknown
2. Precipitating causes of heart failure
   1. Lack of compliance with sodium and fluid restriction
   2. Lack of compliance with drugs
   3. Overactivity
   4. Infection
   5. Arrhythmias
   6. Ischemia
   7. Uncontrolled hypertension
   8. Other
   9. Unknown
3. Comorbidity
   1. Hypertension (Blood pressure >140/90 mmHg)
   2. Diabetes mellitus (Fasting blood sugar ≥125 mg/dl or 2-h blood sugar ≥200 mg/dl)
      Insulin treatment
   3. Hyperlipidemia (Total cholesterol ≥220 mg/dl or LDL ≥140 mg/dl)
   4. Renal failure (Serum creatinine 2.5 mg/dl or dialysis)
      Serum creatinine: [ ] mg/dl
      Hemodialysis
   5. Hyperuricemia (Serum uric acid >7.0 mg/dl)
      Serum uric acid: [ ] mg/dl
   6. Cerebrovascular disease
      (Brain infarction, brain hemorrhage, transient ischemic attack)
   7. Anemia (Hemoglobin ≤10 g/dl)
      Hemoglobin: [ ] g/dl
   8. COPD
   9. Smoking
4. Complications
   1. Prior myocardial infarction
   2. Atrial fibrillation or flutter
   3. Sustained ventricular tachycardia or ventricular fibrillation
5. Medical history
   1. First-time diagnosis of HF
   2. Interval after the initial diagnosis of HF (months)
   3. Prior hospitalization for heart failure
   4. Percutaneous coronary intervention
   5. Coronary artery bypass surgery
   6. Valve surgery

Step 3. Clinical Data (Medical Status)

1. New York Heart Association (NYHA) functional class on admission and at discharge
2. Heart rate (beats/min)
3. Blood pressure (mmHg)
4. Left bundle branch block
   QRS duration: [ ] ms
5. Left ventricular hypertrophy (SV_1+RV_5 or $V_6 \geq 3.5$ mV or RV_5 or $V_6 > 2.6$ mV)
6. Echocardiographic data on admission and at discharge
   1. Left ventricular end-diastolic and end-systolic diameters (mm)
   2. Left ventricular ejection fraction (%)
   3. Left ventricular wall thickness (mm)
   4. Mitral regurgitation
   5. Transmitral velocity (E/A ratio, deceleration time of E wave)
7. Serum BNP levels at admission and discharge

Step 4. Discharge Status and Treatment

1. Discharge status
   1. In-hospital death
      Autopsy
   2. Discharge to home
   3. Transfer to another ward for heart failure treatment
   4. Transfer to another ward to treat other diseases
2. Discharge medications
   1. Angiotensin-converting enzyme inhibitors
      [ ] Enalapril [ ] Lisinopril [ ] Perindopril
      [ ] Imidapril [ ] Captopril [ ] Cilazapril
      [ ] Temocapril [ ] Other [ ] No
   2. Angiotensin II receptor blockers
      [ ] Losartan [ ] Valsartan [ ] Candesartan
      [ ] Telmisartan [ ] Other [ ] No
   3. Beta-blockers
      [ ] Carvedilol: daily dosage [ ] mg/dl
      [ ] Bisoprolol: daily dosage [ ] mg/dl
      [ ] Metoprolol: daily dosage [ ] mg/dl
      [ ] Others: daily dosage [ ] mg/dl
      [ ] No
   4. Diuretics
      [ ] Thiazide [ ] Furosemide [ ] Azosemide
      [ ] Spironolactone [ ] Eplerenone [ ] Other
      [ ] No
   5. Digitalis
      [ ] Yes [ ] No
   6. Oral inotropic agents
      [ ] Pimobendan [ ] Docarpamine [ ] Other
      [ ] No
   7. Calcium channel blockers
      [ ] Amlodipine [ ] Nefedipine [ ] Diltiazem
      [ ] Other [ ] No
   8. Alpha-blockers
      [ ] Doxazosin [ ] Other [ ] No
   9. Nitrates
      [ ] Yes [ ] No
   10. Antiarrhythmic agents
      [ ] Amiodarone [ ] Sotalol [ ] Bepridil
      [ ] Disopyramide [ ] Aprindine [ ] Mexiletine
      [ ] Flecainide [ ] Pilsicainide [ ] Cibenzoline
      [ ] Other [ ] No
   11. Aspirin
      [ ] Yes [ ] No
   12. Antiplatelet agents
      [ ] Ticlopidine [ ] Cilostazol [ ] Other
      [ ] No
   13. Warfarin
      [ ] Yes [ ] No
   14. Statins
      [ ] Pravastatin [ ] Fluvastatin [ ] Atorvastatin
      [ ] Simvastatin [ ] Other [ ] No
   15. Participation in clinical trial
      [ ] J-CHF [ ] Bisoprolol
      [ ] Other
      [ ] No
3. Non-pharmacological therapy
   1. Permanent pacemaker
   2. Cardiac resynchronization therapy
   3. Implantable cardioverter defibrillator
   4. Left ventricular assist device
   5. Cardiac transplantation

Step 5. Long-Term Outcomes

1. Date of survey
2. Death
   1. Date of death
   2. All-cause death
   3. Cause of death
      [ ] Cardiac death [ ] Non-cardiac death [ ] Unknown
   4. Autopsy
3. Hospital readmission because of exacerbation of heart failure
   1. Date of readmission
   2. Date of discharge
4. Sustained ventricular tachycardia or ventricular fibrillation

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Characteristics and Outcomes of Patients With Heart Failure in General Practices and Hospitals

—— Japanese Cardiac Registry of Heart Failure in General Practice (JCARE-GENERAL) ——

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Background The characteristics and outcomes of patients discharged from hospitals with a diagnosis of heart failure (HF) have been described by a number of previous epidemiological studies. However, very little information is available on this issue in general practice in Japan.

Methods and Results The Japanese Cardiac Registry of Heart Failure in General Practice (JCARE-GENERAL) is designed to study the characteristics, treatment and outcomes prospectively in a broad sample of outpatients with HF who were managed by cardiologists in hospital (Hospital-HF) and primary care physicians in general practice (GP-HF). Out of 2,685 patients with HF, 1,280 patients were Hospital-HF and 1,405 GP-HF. Compared to the Hospital-HF patients, GP-HF patients were more likely to be elderly and female, and they had a higher prevalence of hypertensive heart disease as a cause of HF. Angiotensin-converting enzyme inhibitors, angiotensin receptor blockers and β-blockers were more prescribed to Hospital-HF than GP-HF patients. At the follow-up of 1.2 year, after adjustment, the mortality was comparable between the Hospital-HF and GP-HF groups, whereas HF-related admission was higher in the Hospital-HF group than in in the GP-HF group.

Conclusions Based on the JCARE-GENERAL, the characteristics, treatment and outcomes of GP-HF patients differed from those of Hospital-HFpatients in Japan. (*Circ J* 2007; **71:** 449–454)

Key Words: General practice; Heart failure; Hospital; Outcome; Registry

Heart failure (HF) is a complex clinical syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the ventricle to fill with or eject blood. The cardiac manifestations of HF are dyspnea and fatigue, which may limit exercise tolerance, and fluid retention, which may lead to pulmonary congestion and peripheral edema. HF is a leading cause of morbidity and mortality in industrialized countries[1] It is also a growing public health problem, mainly because of aging populations and the increase in the prevalence of HF in the elderly[2] The clinical characteristics, treatment and outcomes of these patients have been well described by a number of hospital-based registries performed in the United States of America[3] Europe[4–6] and Japan[7–11] However, most patients with HF are managed not only by hospital cardiologists but also by primary healthcare physicians in the community (general practitioners). Accordingly, primary care physicians must play a key role in the identification and management for these patients. Nevertheless, much less is known of HF in general practice. There have been no studies reported that provide information on the characteristics, treatment and outcomes in this setting in Japan.

The Japanese Cardiac Registry of Heart Failure in General Practice (JCARE-GENERAL) was developed to provide a large, national prospective registry database describing the clinical characteristics, treatment and outcomes of outpatients with HF. The main aim of the present study was to compare the characteristics and outcomes between patients managed by hospital cardiologists with those managed by primary care physicians in general practice.

Methods

The JCARE-GENERAL is a prospective multicenter registry designed to compile a large clinical database on the characteristics, treatment and outcomes of the outpatients with HF in Japan. Baseline data were collected during November 2004. Follow-up data were collected 1 year after the enrollment.

Study Patients

Eleven participating areas, Hakodate, Shiogama, Mishima, Kahoku in Ishikawa, Motosu in Gifu, Ibaraki, Kasai, Hata in Kochi, Ube, Higashi in Fukuoka, and Kurume, have been selected throughout Japan (Fig 1). In

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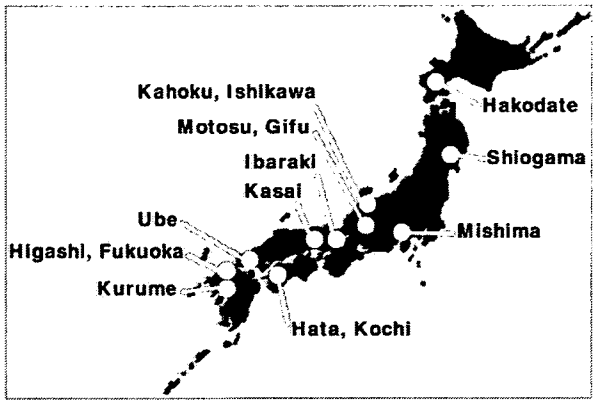

Fig 1. The Japanese Cardiac Registry of Heart Failure in General Practice (JCARE-GENERAL) study areas in Japan.

each participating area, hospital cardiologists and primary healthcare physicians enrolled HF outpatients into the present study. HF patients managed by the hospital cardiologists were categorized as "Hospital-HF" and those managed by primary care physicians in general practice as "GP-HF".

HF was defined as a complex clinical syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the ventricle to fill with or eject blood. For this registry, patients with current HF symptoms as well prior HF were enrolled. The presence of HF was confirmed by the simultaneous presence of at least 2 major criteria or 1 major criterion in conjunction with 2 minor criteria according to the Framingham criteria (Table 1)[12] Patients must have been at least 15 years old at the time of enrollment. Eligibility is not contingent on the use of any particular therapeutic agent or regimen.

Data Collection and Processing

The study protocol, study procedures and data-collection forms were reviewed by the co-investigators at each study area during the central meetings and also presented to all participating physicians during training sessions before commencing the present study. The participating physicians were encouraged to register all patients meeting the entry criteria as consecutively as possible. Duplicated registry of the same patient at different institutions was avoided by checking for their prior enrollment to this registry. Compliance with these methods of registry was not strictly monitored. For each case, baseline data recorded on the form included: (1) demography including age and sex; (2) underlying causes of HF; (3) atrial fibrillation; (4) prior history of HF; and (5) medication. The status of all patients was surveyed and the following information was obtained: (1) whether they survived to the follow up; (2) their cause of death; and (3) hospital admissions due to an exacerbation of HF that required more than continuation of their usual therapy on admission. The cause of death was classified as cardiac or non-cardiac death by the participating physician in each patient based on the clinical information. Death from cardiac causes was defined as death due to cardiac events including sudden cardiac death, fatal myocardial infarction and HF death. Death from causes other than cardiac diseases such as cancer was defined as non-cardiac death.

Ischemic heart disease was considered an etiology of HF if the patient had one of the following: (1) a documented history of myocardial infarction, angina or prior coronary revascularization; (2) pathologic Q waves on the electrocardiogram; or (3) greater than 75% stenosis in one or more coronary arteries on coronary angiograms. Valvular heart disease was determined on the basis of the presence of long standing mitral or aortic valve involvement documented by physical examination and echocardiography or angiography. Hypertensive heart disease was considered present if there was a history of hypertension in the medical records or sustained hypertension and left ventricular (LV) hypertrophy confirmed by electrocardiogram or echocardiogram. Dilated cardiomyopathy was diagnosed by the presence of global LV dilatation with impaired systolic function occurring in the absence of known cardiac or systemic causes.

Table 1 Framingham Criteria for HF

Major criteria
Paroxysmal nocturnal dyspnea
Neck vein distension
Rales
Radiographic cardiomegaly (increasing heart size on chest X-ray)
Acute pulmonary edema
S3 gallop
Increased central venous pressure (>16 cm water at right atrium)
Circulation time ≥25 s
Hepatojugular reflux
Pulmonary edema, visceral congestion, or cardiomegaly at autopsy
Minor criteria
Bilateral ankle edema
Nocturnal cough
Dyspnea on ordinary exertion
Hepatomegaly
Pleural effusion
Decrease in vital capacity by one-third from maximum value recorded
Tachycardia (rate ≥120/min)
Major or minor criteria
Weight loss ≥4.5 kg in 5 days in response to treatment

The diagnosis of HF was established by the simultaneous presence of at least 2 major criteria or 1 major criterion in conjunction with 2 minor criteria.
HF, heart failure.

Patient Confidentiality

The JCARE-GENERAL protocol was organized to ensure compliance with the Guidelines for the Epidemiological Research published by the Japanese Ministry of Health, Labour and Welfare. The original study protocol was approved by the institutional review board at Kyushu University. Informed consent was attained for each patient. The present study did not include any protocol-specified alterations of treatment or any other aspects of hospital care. Patient confidentiality was preserved because direct patient identifiers, such as name, address and identification number, were not collected.

Statistical Analysis

Data are expressed as means±SD. Differences in clinical characteristics, treatment and outcomes were evaluated using the chi-square test or Student's t-test. Survival was estimated with the Kaplan and Meier methods. Differences in survival between the groups were evaluated using the log rank test. After the adjustment for age, sex, etiology of HF, atrial fibrillation and prior history of HF, the relative risk for outcomes including all-cause death, cardiac death and HF-related admission was estimated for the Hospital-HF and GP-HF groups. They were adjusted as categorical

Table 2 Patient Characteristics

	All (n=2,685)	Hospital-HF (n=1,280)	GP-HF (n=1,405)	p value
Age, year (mean±SE)	74±12	71±13	77±10	<0.01
≥75 years, %	56	46	64	<0.01
Male, %	46	55	38	<0.01
Underlying causes of HF, %				
Ischemic	30	27	32	<0.05
Hypertensive	35	22	47	<0.05
Valvular	26	27	25	NS
Cardiomyopathic	15	22	9	<0.05
Others	12	12	12	NS
Unknown	5	4	5	NS
Atrial fibrillation, %	40	42	37	<0.01
Prior history of HF, %	83	90	77	<0.01

GP, general practice. Other abbreviation see in Table 1.

Table 3 Medication Use

	All (n=2,685)	Hospital-HF (n=1,280)	GP-HF (n=1,405)	p value
ACEIs, %	31.5	40.4	23.5	<0.01
ARBs, %	30.9	32.7	29.4	NS
ACEIs or ARBs, %	59.2	68.7	50.6	<0.01
ACEIs and ARBs, %	3.3	4.4	2.3	<0.01
β-blockers, %	27.4	38.3	17.5	<0.01
Diuretics, %	62.0	66.1	58.2	<0.01
Digitalis, %	43.0	45.4	40.8	<0.05
Calcium antagonists, %	37.1	33.4	40.5	<0.01

ACEIs, angiotensin-converting enzyme inhibitors; ARBs, angiotensin receptor blockers. Other abbreviations see in Tables 1,2.

Table 4 Death and HF-Related Admission Rate

	No. of patients		All cause death (%)		Cardiac death (%)		HF-related admission (%)	
	Hospital-HF	GP-HF	Hospital-HF	GP-HF	Hospital-HF	GP-HF	Hospital-HF	GP-HF
Crude rate	1,251	1,377	6.7	5.9	2.9	1.7	11.3	6.8
Age-adjusted rate (95%CI)			7.6 (2.7–12.5)	5.3 (1.9–8.7)	3.0 (0.2–6.1)	1.5 (0.3–3.3)	12.1 (6.0–18.3)	6.8 (2.3–11.3)
Age groups								
–39 years	36	4	11.1	0	5.6	0	8.3	0
40–49 years	52	16	1.9	0	1.9	0	13.5	6.3
50–59 years	132	72	3.0	0	3.0	0	8.3	5.6
60–69 years	237	200	3.4	1.5	1.7	0.5	10.1	4.0
70–79 years	439	503	6.6	3.8	2.7	1.4	11.8	7.2
80–89 years	314	472	10.5	8.3	3.8	2.8	13.1	6.4
90– years	38	108	13.2	18.5	2.6	1.9	7.9	13.9
Sex groups								
Male								
Crude rate	685	508	8.7	7.3	2.9	1.8	12.0	6.9
Age-adjusted rate (95%CI)			10.2 (4.9–15.6)	6.4 (2.7–10.0)	3.1 (0.2–5.9)	1.5 (0.5–3.5)	13.0 (7.4–18.6)	6.8 (1.3–12.3)
Female								
Crude rate	563	858	4.4	5.1	2.8	1.6	10.5	6.9
Age-adjusted rate (95%CI)			4.9 (0.8–8.9)	4.9 (2.3–7.5)	2.9 (0.2–6.1)	1.6 (0.5–2.8)	11.4 (5.2–17.6)	6.9 (3.3–10.5)

The mean follow-up periods for HP-HF and GP-HF were 431±93 days and 424±91 days, respectively.
CI, confidence interval. Other abbreviations see in Tables 1,2.

variables, except for age, which was a numerical variable. Two tailed tests of significance are reported. $p<0.05$ was considered to be statistically significant.

Results

Patient Characteristics

The present study included 2,685 outpatients with HF from 11 areas in Japan; 1,280 patients from 55 hospitals as Hospital-HF and 1,405 patients from 180 general practitioners as GP-HF. The mean number of patients at each hospital and GP was 23±27 and 8±9, respectively. The mean age was 74±12 years (range 15 to 101), and 56% of patients were >75 years of age (Table 2). The mean age and the proportion of aged patients were greater in GP-HF patients compared to Hospital-HF patients (Table 2). Overall, 46% were men and 54% women. The GP-HF patients were more often women (45% vs 62%, $p<0.01$).

Ischemic heart disease was the predominant cause of HF in both groups, but this was more prevalent in the GP-HF group. Hypertensive heart disease was more common in the GP-HF group than in the Hospital-HF group and it was the leading cause of HF in this group of patients. In contrast, cardiomyopathy was less common in GP-HP patients.

The prevalence of atrial fibrillation was greater and the prior history of HF was more frequent in Hospital-HF patients than in the GP-HF group (Table 2).

Medication Use

Angiotensin-converting enzyme (ACE) inhibitors were administered to 32% of the patients, angiotensin receptor blockers (ARBs) to 31%, β-blockers to 27%, diuretics to 62% and digitalis to 43% (Table 3). ACE inhibitors and ARBs were more prescribed to Hospital-HF than GP-HF patients (Table 3). Beta-blockers were prescribed to approximately 38% of Hospital-HF patients whereas they were prescribed to only 18% of GP-HF patients. Prescription rates of diuretics and digitalis were also higher in Hospital-HF patients. In contrast, calcium antagonists were prescribed more often to GP-HF patients.

Mortality and HF-Related Admission

Among 2,685 patients, 57 patients were lost during the follow up (2.1%). The mean follow-up periods for patients with HP-HF and GP-HF were 431±93 and 424±91 days, respectively, which were not significantly different.

During the follow-up, 165 patients (6.3%) died; 59 (36%) from cardiac causes, 53 (32%) from non-cardiac causes and 53 (32%) from unknown causes. The rates of all-cause death as well as cardiac death tended to be greater in Hospital-HF

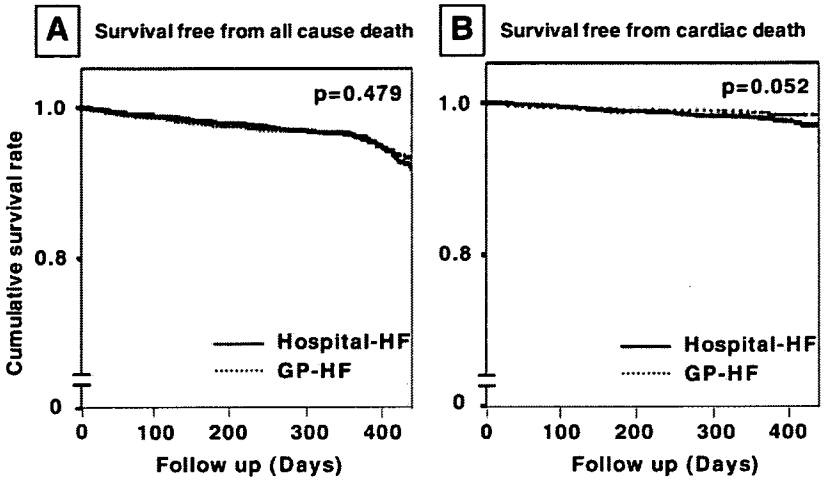

Fig 2. Cumulative survival rates. Survival estimates free from all-cause death (A) and cardiac death (B) during the follow up were derived from the Kaplan and Meier methods. HF, heart failure; GP, general practice.

Table 5 Adjusted Relative Risk for Outcomes by Hospital-HF and GP-HF

	Relative risk (95%CI)	*p value*
All cause death		
Hospital-HF	*1*	
GP-HF	*0.83 (0.59–1.18)*	*0.30*
Cardiac death		
Hospital-HF	*1*	
GP-HF	*0.69 (0.39–1.22)*	*0.20*
HF-related admission		
Hospital-HF	*1*	
GP-HF	*0.62 (0.47–0.82)*	*<0.01*

Adjusted for age, sex, etiology of HF, atrial fibrillation, and prior history of HF.
Abbreviations see in Tables 1,2,4.

patients than GP-HF (Table 4, Fig 2). For the age and sex categories studied, these rates were higher in Hospital-HF patients than in GP-HF, except for all-cause death in female patients (Table 4). However, after adjusting for age or variables including age, sex, causes of HF, atrial fibrillation and prior history of HF, the rates of all-cause death and cardiac death did not differ between Hospital-HF and GP-HF patients (Tables 4, 5).

During the same study period, 235 patients (9%) had a hospital admission due to an exacerbation of HF. The HF-related hospital admission rate was significantly higher in Hospital-HF than in GP-HF patients ($p<0.01$; Table 4), which did not alter even after adjustment (Table 5).

Discussion

The characteristics and outcomes of outpatients with HF in general practice have been poorly described, despite the importance of this disease to public health. The JCARE-GENERAL is the first diverse, large-scale, prospective multicenter database of this population in Japan. An important finding is that HF outpatients in the general practice were more likely to be elderly and women with hypertension as a predominant cause of HF. Evidence-based medications for HF, including ACE inhibitors, ARBs and β-blockers, were less prescribed to GP-HF patients compared to Hospital-HF patients. In contrast, calcium antagonists were prescribed more often to GP-HF patients. At the follow-up of 1.2 years after adjustment, the mortality was comparable between Hospital-HF and GP-HF patients, whereas HF-related admission was higher in Hospital-HF than in GP-HF patients, which might be caused by them having more definite and severe HF.

We have previously reported the characteristics and outcomes of patients hospitalized to the cardiology departments in Fukuoka, Japan[9–11] These studies highlighted several important features of "real world" patients with HF, which were not found in large-scale clinical trials. One key feature was the old age of HF patients. The mean age of the patients was 69 years; 70% were ≥65 years of age. Women especially were mostly over 70 years of age. This is consistent with previous community-based studies[13,14] Another important feature was a relatively good survival prognosis; the 1-year mortality rate being 8.3%. A prognosis of patients with decreased ejection fraction (<40%) was still good; the 1-year mortality rate being 9.1%. At the first glance, this finding appears to be contradicted by the generally held notion that advanced age and more comorbidity may be related to poor survival. In contrast to the relatively low mortality, rates of readmission due to worsening HF were as high as 40% within 1 year after discharge. This value was comparable to those in prior studies (a 3- to 6-month readmission rate 30 to 50%)[15,16] The most commonly identified precipitating cause for hospital readmission was lack of compliance with medical and dietary treatment (48%)[10]

Even though our previous studies have provided a valuable insight into the clinical characteristics, outcomes and the potential effective treatment strategies for HF patients, the generality of these results is questioned because our previous studies were conducted in hospitalized patients with HF[9–11] Outpatients with HF are managed mostly in the community by primary care physicians. Nevertheless, few studies provide objective information about these patients. Therefore, it is of critical importance to analyze the realistic data for HF outpatients in general practice, and to form a database on a national basis for future investigations. For this purpose, JCARE-GENERAL was designed to focus on the demographic and clinical characteristics, treatment strategies and outcomes in "real-world" outpatients managed by primary care physicians in general practice.

The present study demonstrated that, compared to Hospital-HF patients, GP-HF patients were more often elderly and female, and had a higher prevalence of hypertensive heart disease as a cause of HF. In concordance with the

present study, previous studies have shown that the majority of HF patients are elderly and women in the community![17–20] In contrast, more severe cases of HF are referred to hospital cardiologists, and these patients are most comparable to the HF patients included in the randomized clinical trials with respect to a high proportion of younger and male patients. This might explain, at least in part, our findings that Hospital-HF patients had higher rates of mortality and HF-related hospital admission than GP-HF patients.

Another important feature of the present study is the description of the contemporary pharmacological management of HF in general practice in Japan. Even though previous randomized controlled trials have shown that drugs such as ACE inhibitors can improve the survival of HF patients, GP-HF patients were significantly less likely to be prescribed the evidenced-based medications?[21,22] However, these medications are indicated when LV systolic function is reduced and not when it is preserved. GP-HF patients are elderly and more likely to be female and hypertensive, which is more often associated with preserved LV systolic function and may explain, at least in part, the difference in the medication use between Hospital-HF and GP-HF patients![11]

Limitations

Several crucial limitations inherent in the present study should be considered when these data are interpreted. First, although the present study intended to determine the differences between HF patients in general practice and those treated by the hospital cardiologists, the selection or referral bias might be a potential limitation of the present study. This form of bias occurs when younger patients, particularly those at lower risk, are treated by the hospital cardiologists. Elderly patients are then disproportionately represented in general practice. Therefore, the present study compared the outcomes after adjustment for the differences between patients in hospital and general practice. However, more importantly, it is not known whether HF patients treated by general practices have a different outcome from those managed in hospitals. Second, the JCARE-GENERAL data are based on the decisions made by the participating primary care physicians and hospital cardiologists according to the Framingham diagnostic criteria, which may be incomplete or imprecise. The lack of a precise, universal definition of HF makes this type of registry difficult and open to many criticisms. However, it is not the objective of this survey to restrict enrollment to the narrowly defined population of HF usually included in clinical trials but rather to include a broad range of patients reflecting the current reality of clinical practice rather than trials. Moreover, the information regarding the study protocol was regularly provided at national as well as local meetings in each area. Third, even though data validation included manual verification and correction of all numeric fields in the present study, the validation of the registered data regarding the diagnosis by comparison with the source data were not performed. Further, even though the participating physicians were encouraged to register all patients meeting entry criteria as consecutively as possible, it was not verified whether all patients were indeed registered. Fourth, the present study did not determine the prevalence of patients who met 2 major Framingham criteria for HF or 1 major and at least 2 minor criteria. Fifth, the information on cardiac structure and function especially by using echocardiography were not available in the present study, which might make it difficult to diagnose structural heart disease as a cause of HF and its disease severity, and further differentiate between patients with reduced and preserved systolic function. Nevertheless, the main focus of the present study as well as most other epidemiological studies is to obtain information on the realistic picture of HF based on the symptoms, rather than LV systolic dysfunction. Sixth, the majority of HF patients in the present study had prior history of HF although it was more prevalent in Hospital-HF than in GP-HF patients (Table 2). The data regarding the length between the initial diagnosis of HF and the enrollment to this registry were not available in the study patients and might differ between Hospital-HF and GP-HF patients, which could be a potential variable affecting their outcomes. Seventh, the present study defined cardiac death as death due to cardiac events including sudden cardiac death, fatal myocardial infarction and HF death. The cause of death was diagnosed in each patient by the participating physician based on the clinical information and not verified by the death certificate.

Conclusions

The JCARE-GENERAL has provided the first, valuable information on the characteristics, management and outcomes in a broad sample of "real world" outpatients with HF in general practice in Japan. They were different from those managed by cardiologists in hospital. The mortality was comparable between Hospital-HF and GP-HF patients, whereas HF-related admission was higher in Hospital-HF patients. By helping to characterize this disease state better, it will ultimately have a significant impact on public health at the national level in Japan.

Acknowledgments

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Appendix 1

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Gifu Motosu area: Hisayoshi Fujiwara (Gifu University); Kazuhiko Nishigaki (Gifu University).
Ibaraki area: Masatsugu Hori (Osaka University; President of the Japanese Society of Heart Failure); Kazuhiro Yamamoto (Osaka University).
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臨床講義

慢性心不全治療における疾患管理

筒井裕之

はじめに

慢性心不全患者は高齢者が多く，その生命予後が不良であるばかりでなく，心不全増悪による再入院を反復する。再入院には，不整脈・心筋虚血・感染症などの医学的要因ばかりでなく，治療コンプライアンス不良や身体的・精神的ストレスなどが密接に関与する。慢性心不全に対する薬物治療の効果を最大限引き出し，再入院を減少させ，症状・生活の質（QOL）を改善するには，患者および家族教育・治療コンプライアンスの向上・病状モニタリング・服薬管理・看護師や薬剤師も加えた治療体制などを含む疾患管理（Disease management）が極めて重要である。

本稿では，慢性心不全患者の治療において疾患管理が必要とされる背景，その有効性と具体的な方法について概説する。

Ⅰ．慢性心不全患者における再入院

慢性心不全は高血圧，虚血性心臓病，心筋症など器質的心疾患の終末像であるが，その患者の多くは入・退院を繰り返す高齢者である。このような患者は増加の一途を辿っており，今後さらに増加していくと予想される。近年特に，入退院を繰り返す高齢の慢性心不全患者が，心臓救急の現場で著しく増加しており，有効な対策を打ち出すことが急務となっている。

欧米では，このような慢性心不全患者の増加は，臨床上の問題のみならず医療経済も含んだ大きな社会問題として捉えられ，その効果的治療法や予防法の確立を目的とした大規模な登録研究や臨床試験が行われている。しかしながら，わが国では慢性心不全を対象とした疫学研究が極めて乏しいため，このような患者の数，臨床像，治療および予後などの実態は不明である。

我々は，福岡市内の5つの循環器科を有する医療機関（病床数20～60床）において平成9年1年間に自宅へ退院した慢性心不全患者230名を登録し，患者背景（年齢，性別），臨床的特徴（基礎心疾患，重症度，心エコー所見など）を調査した。さらに，平均2.4年間経過観察し，その間の死亡（死亡の原因）と心不全増悪による再入院を調査した。また，福岡市東区において外来治療を受けている慢性心不全患者419名についても調査した。その結果，慢性心不全の入院患者の平均年齢は，69歳であり，65歳以上の高齢者が70％を占めた（図1）。外来患者はさらに高齢であった。慢性心不全の基礎疾患としては，虚血性心疾患や高血圧性心疾患が多かった（図2）。また，退院後1年死亡率が8％であるのに対し，心不全の増悪による再入院が35％と極めて高率であった（図3）[1)2)]。

Ⅱ．心不全増悪による再入院に関与する因子

心不全増悪による再入院の誘因を検討すると，塩分・水分制限の不徹底が33％と最も多く，過労，治療薬服用の不徹底，精神的または身体的ストレスなどの予防可能な因子が上位を占め，感染症・不整脈・心筋虚血・高血圧などの医学的要因よりむしろ多かった（表1）。さらに，心不全増悪による再入院の規定因子を明らかにするために，再入院81例と非再入院149例で，患者因子（年齢，性），医学的因子（基礎疾患，心房細動，NYHA分類，左室駆出率，心不全の入院歴，入院期間，高血圧・糖尿病・腎不全・脳血管疾患などの合併症，薬物療法），および社会環境因子（就労，収入状況，独居，介護者，在宅看護・介護サービス，外来受診頻度）の関与をロジスティック回帰分析により解析すると，「退院後外来受診が少ない」「心不全の入院歴あり」「入院期間が長い」「在宅

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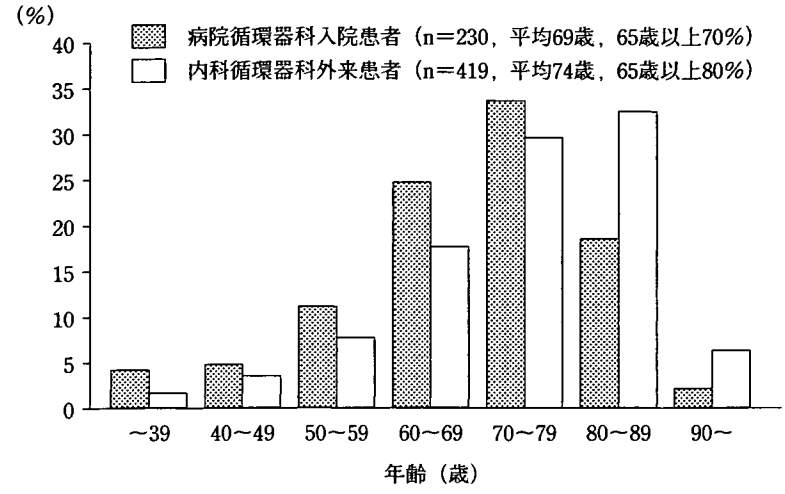

図　1　年　齢　分　布（文献1より改変引用）

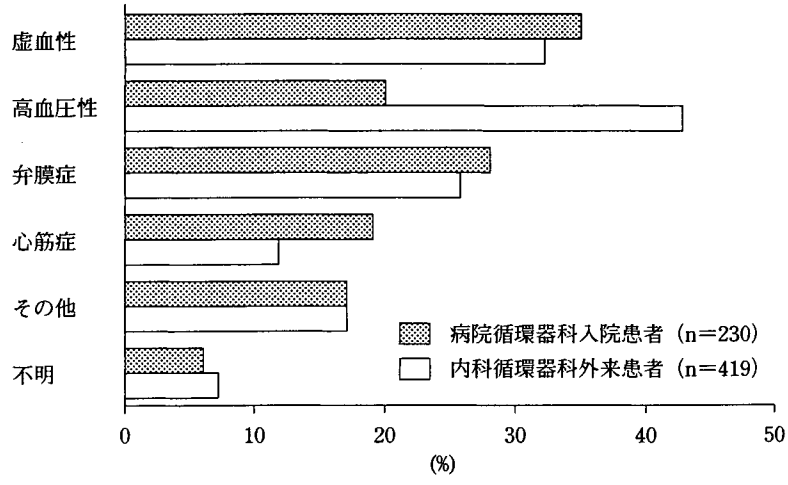

図　2　基　礎　心　疾　患（文献1より改変引用）

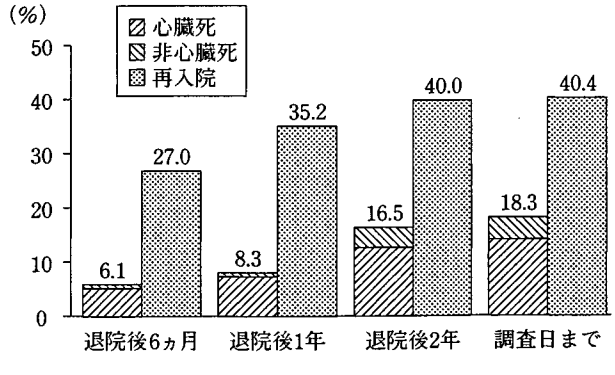

図　3　退院後死亡率・再入院率（文献1より改変引用）

表　1　心不全増悪による再入院の誘因

	%
塩分・水分制限の不徹底	33
感染症	20
過労	12
治療薬服用の不徹底	11
不整脈	11
身体的・精神的ストレス	5
心筋虚血	5
コントロール不良の高血圧	4
合併疾患の増悪	4

（文献3より改変引用）

療養サービスの利用なし」「就労なし」「高血圧の既往あり」などで再入院が多かった。受診頻度が月0～1回の患者は，それ以上の患者より再入院のリスクが約5倍高かった（図4）[3]。

このような慢性心不全患者の実態は，医療専門職による退院後の十分なフォローアップや支援が，心不全患者の再入院の予防においてきわめて重要であることを示唆している。

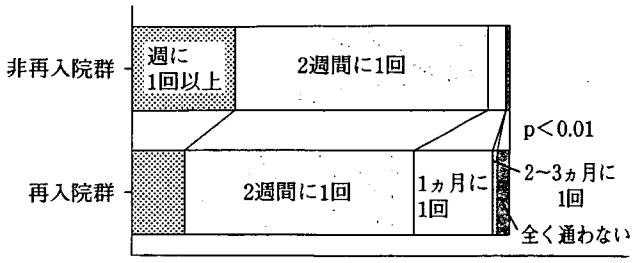

図 4　退院後外来受診の頻度（文献3より改変引用）

Ⅲ. 慢性心不全治療における疾患管理の有効性

欧米では1990年代半ばから心不全患者を対象として疾患管理の予後に対する有効性を検証する介入試験が行われてきた。その結果，患者教育，治療コンプライアンスの向上，訪問や電話などによる患者モニタリング，治療薬の調節，看護師による管理などの患者管理が慢性心不全患者の予後の改善に有効であることが報告されている。特にRichら報告は，疾患管理の有効性を示した最初の画期的研究と位置づけられている。この研究では，高齢心不全患者を対象に，多職種による退院前患者教育の強化，退院後の社会資源の積極的活用，退院後の訪問看護や電話によるフォローアップを行った介入群と，通常の治療を受けた対照群に分け，退院後90日の再入院率，生存率，QOL，医療コストへの効果を検討した。その結果，介入群は対照群に比較し再入院率が50%減少し，QOLスコアが改善し，医療費も低かった[4]。さらに，Stewartらは，循環器専門看護師による退院後の定期的な在宅訪問によって症状のモニタリングや服薬・食事に関する患者教育を行うHome-based intervention（HBI）により再入院率が50%減少し，医療機関に通院する日数が1/2に抑えられたと報告した[5]。さらに，平均4.2年追跡した結果，HBIにより死亡または再入院が減少することも報告されている[6]。また，DIAL試験では，1,518名の安定した在宅心不全患者を対象に，電話を用いて症状，体重コントロールの監視，服薬，食事療法，運動に関するコンプライアンスの評価を行った介入群と，通常の治療の対照群とを比較し，電話モニタリングにより全死亡あるいは心不全増悪による再入院のリスクが20%減少することが示された[7]。このような患者管理プログラムの予後に対する効果を検討したメタアナリシスでは，在宅訪問による患者教育やモニタリング，外来でのフォローアップの強化または電話による指導，退院後の社会資源の積極的活用，あるいはこれらの組み合わせにより再入院が減少し，QOLも向上することが明らかにされている[8]。薬物療法による心不全増悪による再入院に対する減少効果は，ACE阻害薬で22%（SAVE），β遮断薬で32%（CIBIS Ⅱ），ジギタリスで23%（DIG），スピロノラクトンで35%（RALES）にとどまっており，疾患管理の効果は薬物治療の効果と同等あるいはそれ以上と考えられる。疾患管理は単独で効果を有するものではなく，疾患管理によって最適な薬物治療が行われ，治療コンプライアンスが向上し，薬物治療の効果を最大限に引き出せることが期待できる。

表 2　慢性心不全患者に対する疾患管理プログラムの要点

1. 包括的アプローチ
2. 教育および支援
（患者や家族あるいは介護者に対して）
3. 薬物治療の適正化
4. 退院後の十分かつ頻回なフォローアップ
（外来・在宅・電話）
5. 医療専門職との密接な連絡
6. ケアの連携・統合
7. 心不全症状・徴候の早期発見
8. 運動療法

（文献9より改変引用）

Ⅳ. 慢性心不全患者の疾患管理のやり方

慢性心不全患者の疾患管理の要点は，チーム医療（医師・看護師・薬剤師），退院時指導，フォローアップ計画（病診連携），ガイドラインに沿った薬物治療，十分な患者教育・カウンセリング（入院・外来・在宅），患者モニタリングによる心不全増悪の早期発見，利尿薬の自己もしくは看護師による調節などがあげられる（表2）[9]。

なかでも，患者教育は極めて重要である（表3）[10]。具体的には，以下の「一般的知識」，「症状のモニタリングと増悪時の対処方法」，「食事療法」，「薬物治療」，「活動および運動」，「危険因子の是正」などについて，入院中，退院時，さらに外来において継続的に取り組む必要がある。

1. 一般的知識

患者と家族に，心不全の病態をわかりやすく説明する必要がある。患者にとって，心不全の病態はきわめて複雑であるが，治療内容を理解し，コンプライアンスを向上させるために欠かせない知

表　3　慢性心不全患者および家族・介護者に対する教育・カウンセリングの内容

一般的事項	薬物療法
心不全の病態の説明	薬の性質，量，副作用
身体的変化（症状・徴候）	併用薬剤
精神的変化	複雑な薬物治療への対処
予後	費用
症状のモニタリングと管理	遵守するための方法
心不全増悪時の症状	活動・運動
体重の自己測定（毎日）	仕事および余暇
症状増悪時の対処方法	運動療法
精神症状の対処方法	性生活
食事療法	遵守するための方法
塩分・水分制限	危険因子の是正
アルコール制限	禁煙
遵守するための方法	肥満患者に対する体重コントロール
	高脂血症，糖尿病，高血圧の管理

（文献10より改変引用）

識である。心不全の症状については，労作時呼吸困難，起座呼吸，発作性夜間呼吸困難や下腿浮腫のほかに，全身倦怠感や食思不振などについても説明が必要である。

また，抑うつや不安などの精神症状の出現にも注意を要する。最近，抑うつ症状が心不全患者のQOLばかりでなく予後にも影響を及ぼすことが報告されている。したがって，心不全患者に対する支援には精神的支援も含む必要がある。さらに，症状によっては，心療内科医による診断・治療や臨床心理士によるカウンセリングも考慮すべきである。

2.　症状のモニタリングと増悪時の対処方法

症状のモニタリングについては，呼吸困難や浮腫などの主要症状とともに，増悪時の症状とその対処方法を十分に説明しておく必要がある。特に，心不全増悪の症状を認めた場合，利尿薬の増量，さらに必要に応じて速やかに受診することにより不必要な入院を回避できることも重要である。

高齢心不全患者では，浮腫など症状に気づきにくいため，家族あるいは介護者によるモニタリングが必要となる。また，日々の体重測定は，患者自身による心不全増悪の自己診断法として有用である。

3.　食　事　療　法

心不全増悪の誘因として塩分制限の不徹底は，頻度が高い。塩分制限の必要性は理解していても，日常生活において継続することはしばしば困難である。看護師や栄養士と連携し，単に塩分・水分制限の内容のみにとどまらず，患者個々の生活環境に合わせた具体的かつ実現可能な指導が求められる。

4.　薬　物　療　法

薬物療法の中断は心不全増悪の誘因のひとつであり，服薬のコンプライアンスを向上させることが治療成功の鍵となる。薬剤名，投与量，投与回数，副作用についての知識を指導するとともに，薬剤師と連携し投薬量のチェック，コンプライアンスのチェック，副作用のモニタリングなどを行うことが必要である。

5.　活動および運動

慢性心不全の急性増悪期には，活動制限，安静は欠かすことができない。一方，安定した心不全患者においても，過度の労作は急性増悪の引き金となるため，重症度に基づいた日常生活活動の指示が必要である。就労している患者では，職場環境が身体的ストレスとなり，心不全増悪の原因になる可能性があるため，患者背景に応じた指導が必要である。

6.　危険因子の是正

禁煙やアルコール制限とともに，心不全の危険因子である高脂血症，糖尿病，高血圧のコントロールが重要である。特に，高血圧は心不全の原因となるばかりでなく，心不全増悪因子としても重要であり，血圧のコントロールに十分な配慮が必要である。

V. 問題点と今後の課題

慢性心不全患者に対する疾患管理の有効性は確立しているが，未解決の問題点も残されている。すなわち，有効なプログラムの標準化が未確立，最適なマネージメントの強度が不明，有効な対象

患者が不明，生命予後に対する有効性が不明などである。さらに，介護保険制度というわが国独自の医療制度のもと日本人の患者における疾患管理の具体的な方策やその有効性についても検討されていない。欧米で行われた研究結果をそのままわが国の患者にあてはめることができないのは言うまでもなく，今後わが国独自の研究が必要である。

ま　と　め

慢性心不全患者に対する疾患管理により，心不全増悪による再入院の減少など予後の改善が期待できる。したがって，心不全治療における疾患管理は薬物治療に付加する一般的治療としてではなく，心不全治療そのものとしてとらえるべきである。

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わが国における慢性心不全の特徴
—臨床疫学研究によるエビデンスから—

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はじめに

人口の高齢化・生活習慣の欧米化に伴う虚血性心疾患の増加により慢性心不全患者は増加の一途をたどっているが，今後さらに増加していくと予想される．米国では約500万人の患者が心不全に罹患し，毎年50万人が新たに心不全と診断されている．また，30万人が心不全を原因として死亡し，死亡者数は年々増加している．慢性心不全患者の増加は医療コストの増大につながることから，欧米では，心不全患者の増加は医療上の問題ばかりでなく社会問題として捉えられており，患者の実態の解明や効果的治療法の確立を目指した大規模な疫学研究や臨床試験が数多く行われている．わが国では，このような研究がきわめて乏しいが，欧米各国と同様に慢性心不全患者が増加していると考えられ，今後この傾向はさらに強まると推測される．

本稿では，臨床疫学研究からみたわが国の慢性心不全患者の特徴について概説する．

有病率

一般地域住民を対象としたフラミンガム研究によると，年齢ごとの慢性心不全の有病率は，50～59歳で800，60～69歳で2,300，70～79歳で4,900，80歳以上で9,100（人口10万対）と報告されている[1]．Eriksson らのスウェーデン男性（855例）を対象とした調査では，有病率は50歳で2,100（人口10万対）であったのに対して，67歳では13,000であった[2]．Clarke らの英国ノッティンガム州全居住者における調査では，有病率は800～1,600（人口10万対）であった[3]．

これらの研究は，心不全の定義，診断基準，症例の確認方法，調査方法などが異なるため単純に比較することはできないが，共通していえることは心不全の有病率は年齢とともに増加すること，心不全患者が年々増加傾向にあることである．わが国では診療所を受診した患者や地域住民を対象とした調査がないため正確な有病率は報告されていないが，約100万人の慢性心不全患者がいると推測されている．

基礎疾患と合併症

われわれの福岡市での調査研究における慢性心不全患者（循環器科入院患者）の年齢分布は65歳以上が70％を占め，女性により高齢者が多かった（図1）[4]．開業医を中心に治療を受けている外来患者は，さらに一層高齢であった．現在までに，わが国および欧米で行われてきた観察研究においても，慢性心不全患者は高齢で平均年齢は

[Key words] 慢性心不全，臨床疫学，有病率，予後，拡張不全

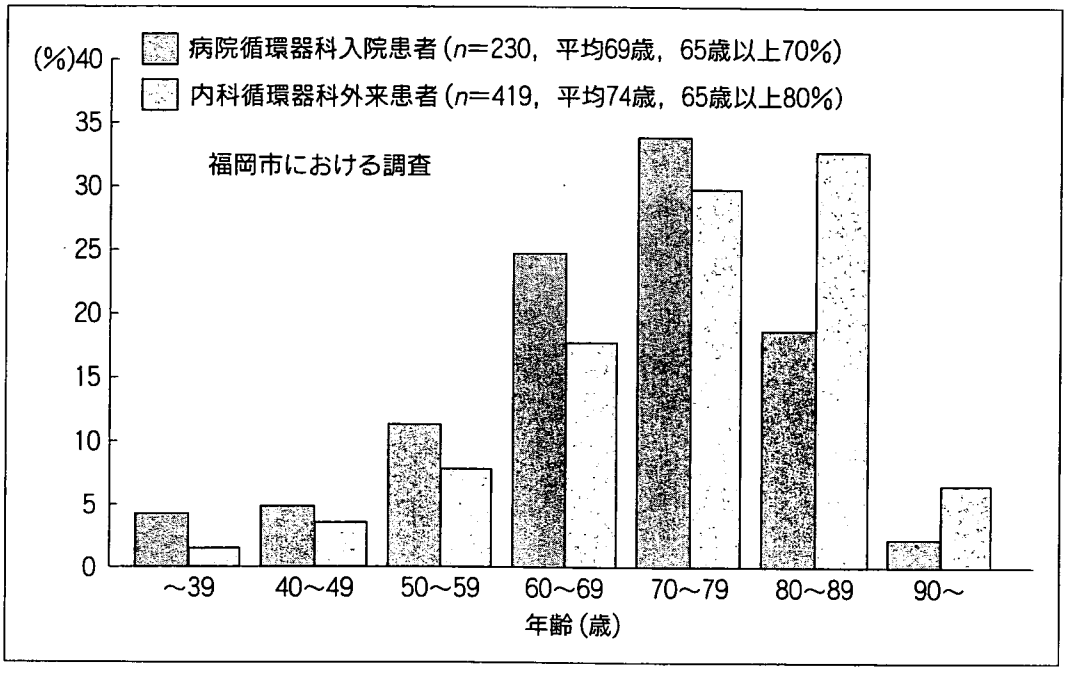

図 1　年齢分布

(文献 4 より引用, 改変)

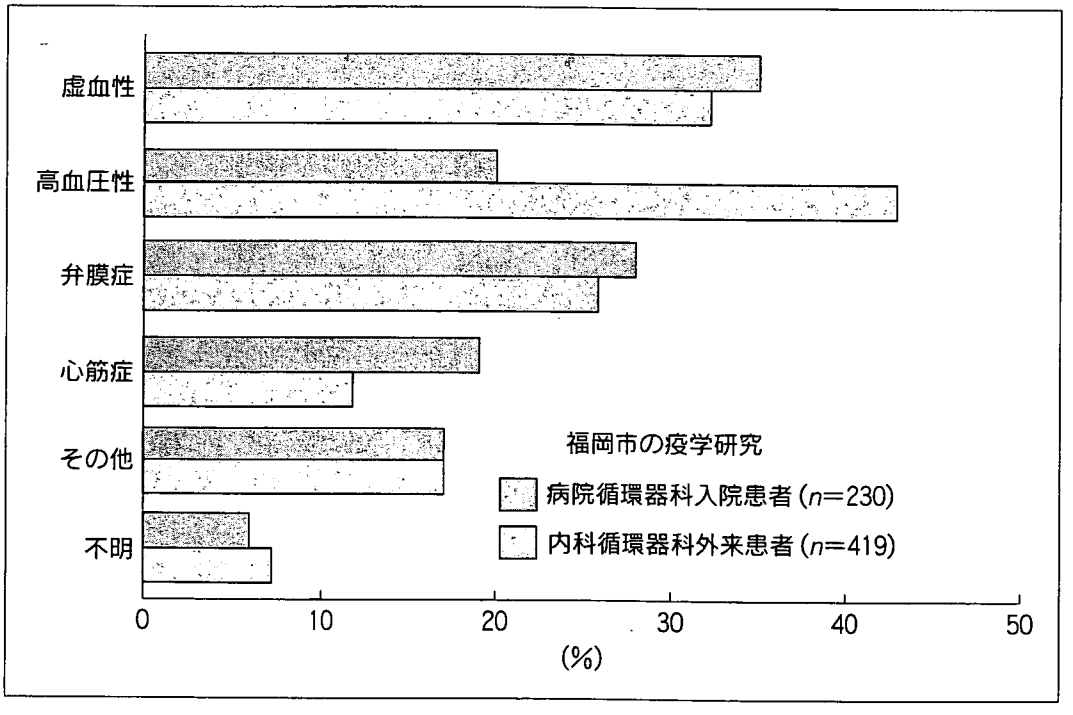

図 2　基礎心疾患の内訳

(文献 4 より引用, 改変)

70歳であった.

原因疾患は, 虚血性心疾患が全体の 1/3 を占め (**図 2**), この数値は最近の欧米での観察研究の結果と同等であるが, 大規模臨床試験の対象患者における割合 (60~75%) に比し低値であった. 一方, 高血圧を原因とする心不全が20~40%を占