What's Different in Korean Heart Failure : Focusing on Etiology

Seok-Min Kang, MD, Ph D.

Director, Heart Failure & Cardiac Wellness Center,
Professor, Division of Cardiology,
Severance Cardiovascular Hospital,
Yonsei University College of Medicine,
Seoul, Korea

Different People in Different Country Studies

세브란스 SEVERANCE

Population studies

Epidemiology

Cohorts
Registries
Survey

Observational Studies

Clinical trials

Selected patients

한국인 급성심부전 환자의 임상 양상 및 예후인자

대한순환기학회 창립 50주년 기념사업

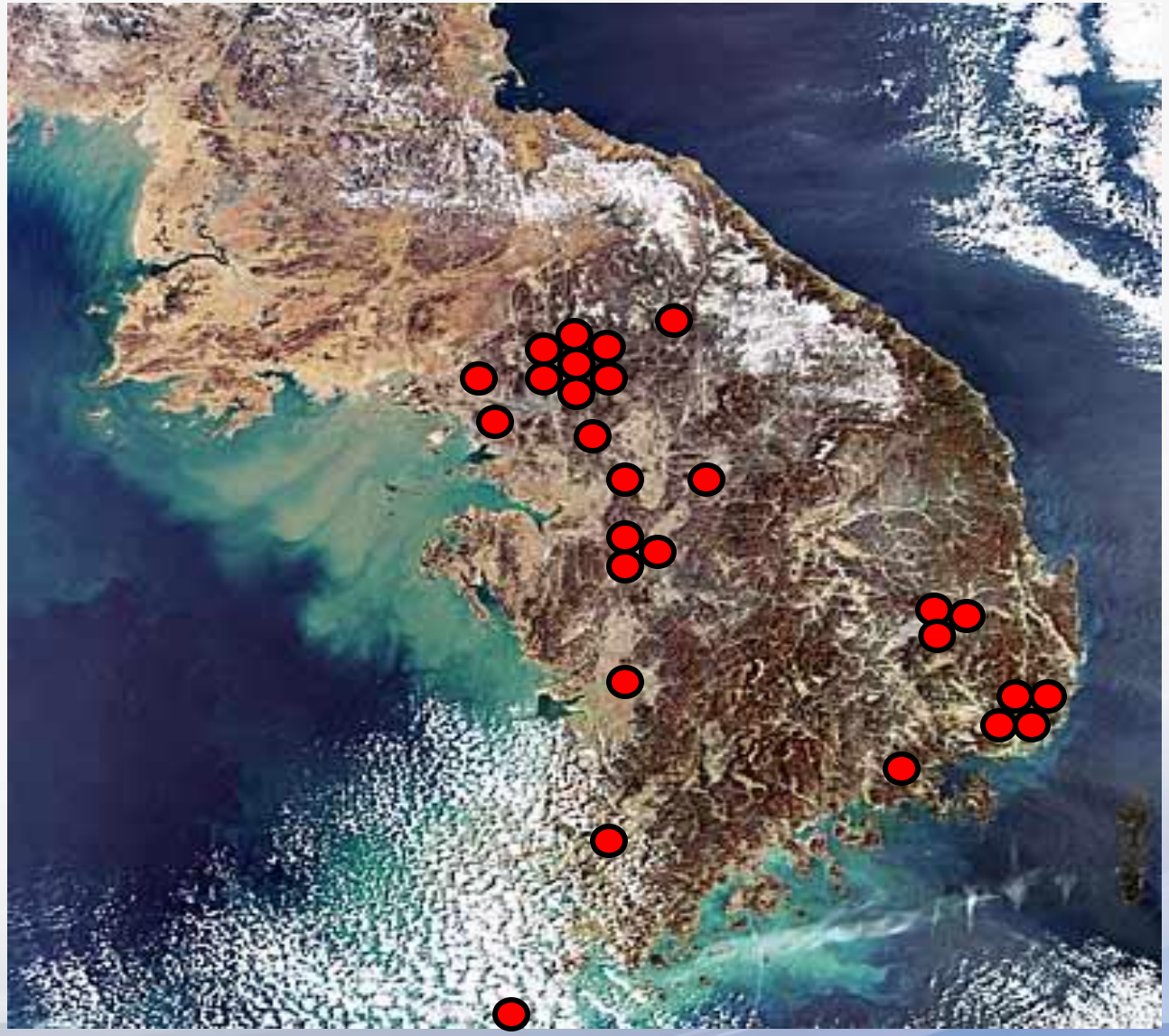
Study Group of Korean Acute Heart Failure (KorHF) Registry

유규형, 한림대학교 동탄 성심병원 (책임연구자)

Between June 2004 and April 2009
N = 3,200

Korean Acute Heart Failure Registry

(24 University Hospitals in Korea)



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Characteristics, Outcomes and Predictors of Long-Term Mortality for Patients Hospitalized for Acute Heart Failure: A Report From the Korean Heart Failure Registry

Dong-Ju Choi, MD[1,14], Seongwoo Han, MD[2], Eun-Seok Jeon, MD[3], Myeong-Chan Cho, MD[4], Jae-Joong Kim, MD[5], Byung-Su Yoo, MD[6], Mi-Seung Shin, MD[7], In-Whan Seong, MD[8], Youngkeun Ahn, MD[9], Seok-Min Kang, MD[10], Yung-Jo Kim, MD[11], Hyung Seop Kim, MD[12], Shung Chull Chae, MD[13], Byung-Hee Oh, MD[14], Myung-Mook Lee, MD[15], and Kyu-Hyung Ryu[16] on behalf of the KorHF Registry

[1]Department of Internal Medicine, Seoul National University College Medicine, Korea University College of Medicine, Seoul, [3]Department Samsung Medical Center, Seoul, [4]Department of Internal Medicine, C [5]Department of Internal Medicine, University of Ulsan College of Me Yonsei University Wonju Christian Hospital, Wonju, [7]Department of [8]Department of Internal Medicine, Chungnam National University C Chonnam National University College of Medicine, Gwangju, [10]Depa [11]Department of Internal Medicine, Yeungnam University College of M College of Medicine, Daegu, [13]Department of Internal Medicine, Kyu Internal Medicine, Seoul National University College of Medicine, Sec College of Medicine, Ilsan Hosptial, Goyang, [16]Department of Interna

ABSTRACT

Background and Objectives: Acute heart failure (AHF) is a izations. However, there are few studies on the characteristics, were to describe the clinical characteristics, management an **jects and Methods:** We analyzed the clinical data of 3,200 and April 2009 from the Korean Heart Failure (KorHF) Regi patients were female. **Results:** Twenty-nine point six percent of the patients had ischemic heart disease. Left ventricular ej mean LVEF was 38.5±15.7% and 26.1% of the patients had p lent in the females (34.0% vs. 18.4%, respectively, p<0.001). 53.7% received either angiotensin converting enzyme-inhibit ceived both BB and ACEi/ARB. The 1-, 2-, 3- and 4-year mor ate analysis revealed that advanced age {hazard ratio: 1.023 (95 of heart failure {1.735 (1.150-2.618); p=0.009}, anemia {1.973 0.007}, a high level of serum N-terminal pro-B-type natriu the use of BB at discharge {0.599 (0.360-0.997); p=0.490} wer ent here the characteristics and prognosis of an unselected po was comparable to that reported in other countries. The ind- heart failure, anemia, hyponatremia, a high NT-proBNP level and taking BB at discharge. **(Korean Circ J 2011;41:363-371)**

KEY WORDS: Heart failure; Registries; Outcome.

Table 1. Demographic and clinical features

Characteristics	Total, n=3,200	Female, n=1,600 (50%)	Male, n=1,600 (50%)	p*
Age (year, mean±SD)	67.6±14.3	70.7±13.5	64.5±14.5	<0.001
BMI (kg/m^2)	23.2±4.0	23.0±4.2	23.4±3.8	0.009
Previous medical history (%)				
Heart failure	871 (29.6)	453 (30.4)	418 (28.7)	0.313
Hypertension	1,486 (46.5)	787 (49.2)	699 (43.7)	0.002
Diabetes	975 (30.5)	489 (30.6)	486 (30.4)	0.927
Stroke	299 (18.9)	137 (18.0)	162 (19.8)	0.361
Chronic renal disease	295 (9.2)	134 (8.4)	161 (10.1)	0.970
Chronic pulmonary disease	104 (3.5)	43 (2.9)	61 (4.2)	0.055
Underlying disease (%)				
Ischemic heart disease	1,544 (52.3)	828 (53.6)	716 (46.4)	<0.001
Hypertension	1,143 (36.7)	596 (38.1)	547 (35.3)	0.103
Cardiomyopathy	760 (26.5)	351 (24.3)	409 (28.8)	0.007
Valvular heart disease	407 (12.7)	255 (16.4)	152 (9.7)	<0.001
Myocarditis	22 (0.7)	8 (0.6)	14 (1.0)	0.187
Infiltrative disease	12 (0.4)	5 (0.3)	7 (0.5)	0.545

*Comparison between the female and male groups. BMI: body mass index

Interim Analysis

세브란스 SEVERANCE

질병관리본부 학술연구용역사업 (3차년도)

심부전(Heart Failure) 질환 Registry 구축 및 관리 사업(전향적)
(KorAHF registry, N=2,066)

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오병희, 서울대학교 의과대학, 서울대학교병원 (책임연구자)

삼성서울병원, 서울아산병원, 서울성모병원, 신촌세브란스병원,

원주기독병원, 분당서울대학교병원, 경북대학교병원,

충북대학교병원, 전남대학교병원

A multicenter cohort study of acute decompensated heart failure syndromes in Korea: Rationale, design and interim observations from the first 2,066 cases in the Korean Acute Heart Failure (KorAHF) registry

[1]Sang Eun Lee, MD, [1]Hyun-Jai Cho, MD, [1]Hae-Young Lee, MD, [1]Han-Mo Yang, [2]Jin Oh Choi, MD, [2]Eun-Seok Jeon, MD, [3]Min-Seok Kim, MD, [3]Jae-Joong Kim, MD, [4]Kyung-Kook Hwang, MD, [5]Shung Chull Chae, MD, [6]Suk Min Seo, MD, [6]Sang Hong Baek, MD, [7]Seok-Min Kang, MD, [8]Dong-Ju Choi, MD, [9]Byung-Su Yoo, MD, [10]Youngkyun Ahn, MD, [11]Hyun-Young Park, MD, [4,11]Myeong-Chan Cho, MD, [1]Byung-Hee Oh, MD

[1]Department of Internal Medicine, Seoul National University Hospital, Seoul, Korea. [2]Sungkyunkwan University College of Medicine, Seoul, Korea; [3]University of Ulsan College of Medicine, Seoul, Korea; [4]Chungbuk National University College of Medicine, Cheongju, Korea; [5]Kyungpook National University College of Medicine, Daegu, Korea; [6]The Catholic University of Korea, Seoul, Korea; [7]Yonsei University College of Medicine, Seoul, Korea; [8]Seoul National University Bundang Hospital, Seongnam, Korea; [9]Yonsei University Wonju Christian Hospital, Wonju, Korea; [10]Heart Research Center of Chonnam National University, Gwangju, Korea; and [11]National Institute of Health (NIH), Osong, Korea.

Previous Medical Hx & Risk Factors : KorHF registry, 2011

Previous Medical Hx.	Total N=3,200(%)	Female, n=1,600	Male, n=1,600	P
Hypertension	1,486(46.5%)	787(49.2%)	699(43.7%)	0.313
Diabetes	975(30.5%)	489(30.6%)	486(30.4%)	0.927
History of HF	871(29.6%)	453(30.4%)	418(28.7%)	0.313
Stroke	299(18.9%)	137(18.0%)	162(19.8%)	0.361
Chronic renal disease	295(9.2%)	134(8.4%)	161(10.1%)	0.970
Chronic pulm. disease	104(3.5%)	43(2.9%)	61(4.2%)	0.055

Data from KorHF registry, Korean Circ J, 2011

Comorbidities : KorAHF registry, 2013

	KorAHF	ATTEND [10]	ADHERE [13]	OPTIMIZE-HF [15,16]	EHFSII [17]	ADHERE International-Asia Pacific [8]
Country	Korea	Japan	USA	USA	Europe	8 AP countries
Time period	2011.3-	2007.5-(2012.9)	2001.9-2004.1	2003.3-2004.12	2004.10-2005.8	2006.1-2008.12
Sample size	2066/4500 (goal)	1110 (2009.6)	159168	48612	3580	10171
Follow-up duration	>2.5 years (goal)	180 days		60,90 days	3-, 12-month	N/A
Demographics						
Age (SD), years	69 (14)	73 (14)	72 (14)	73 (14)	70 (13)	66, range [53-77]
Male (%)	55	59	48	48	61	57
Comorbidities (%)						
Hypertension	59	71	74	71	63	64
DM	36	34	44	42	33	45
A.fibrillation	27	40	31	31	39	24
Chronic lung disease	11	9	31	28	19	N/A

Data from KorAHF registry, 2013

EuroHeart Failure Survey- I

세브란스 SEVERANCE

Concomitant CV diseases or Risk Factors

- **Hypertension : 53 %**
- **DM : 27 %**
- **Stroke : 9 %**
- **Dyslipidemia : 35 %**
- **Ischemic HD : 68 %**

Cleland JGF, et al. Euro Heart J, 2003

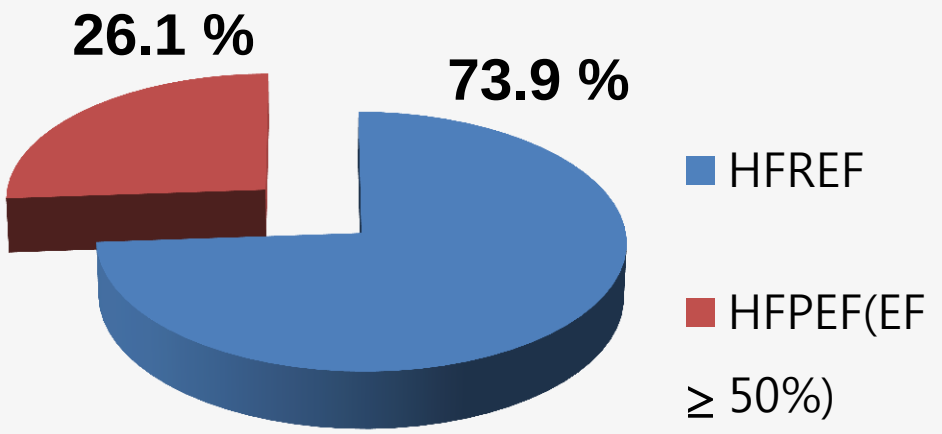
Table. Clinical Characteristic of Patients Hospitalized With AHFS

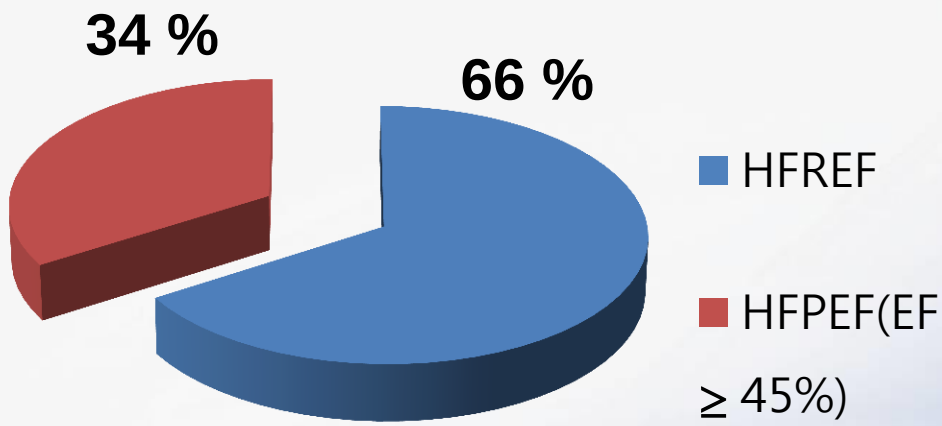
	ADHERE[1]	EHFS I[2,3]	EHFS II[4]	FINN-AKVA[7]	EFICA[5]	AHFS IN ITALY[6]
Geographic zone	United States	24 countries	30 countries	Finland	France	Italy
Inclusion period	2001–2004	2000–2001	2004–2005	2004	2001	2004
Patients, No.	105,388	11,327	3580	620	581	2807
Mean age, y	74±14	71	70±12	75±10	73±13	73±11
Men, %	48	53	61	50.4	59	59
Admitted in ICU/CCU, %	19	7	50	51.4	100	69
Cardiogenic shock, %	2	<1	3.9	2	32	8
Known CHF, %	75	65	63	51	66	56
Previous AHF hospitalization, %	33	44	44.5[a]	20[b]	35	—
History and cardiovascular risk factors, %						
Ischemic heart disease (myocardial infarction history)	57 (31)	68 (39)	53.6 (—)	55.2 (27.7)	46 (22)	46 (37)
Arterial hypertension	73	53	62.5	54.7	60	66
Diabetes mellitus	44	27	32.8	32.3	27	38
Renal insufficiency (creatine serum levels >2 mg/dL)	30	17	16.8	9.4[c]	53	25
Evolution						
Mean length of hospitalization, d	4	11	9	7[d]	15	9
In-hospital mortality, %	4	7	6.7	7.1	28	7

Abbreviations: ADHERE, Acute Decompensated Heart Failure National Registry; AHFS, acute heart failure (AHF) syndrome; CCU, coronary care unit; CHF, congestive heart failure; EFICA, French Study of Acute Heart Failure; EHFS, European Heart Failure Survey; FINN-AKVA, Finnish Acute Heart Failure Study; ICU, intensive care unit. [a]Hospitalized during the previous year. [b]Hospitalized during the previous 6 months. [c]Chronic kidney disease. [d]Median length of stay. Reproduced with permission from Alla et al.[2]

Adams KF, et al. Congest Heart Fail. 2008

HFREF vs. HFPEF





Available echo data (88.8%)

Data from KorHF registry (Korean Circ J, 2011)

Data from Euro Heart Failure Survey I

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Clinical Presentation, Management, and In-Hospital Outcomes of Patients Admitted With Acute Decompensated Heart Failure With Preserved Systolic Function

A Report From the Acute Decompensated Heart Failure National Registry (ADHERE) Database

Preserved EF ≥ 40 %

Table 1. Demographic Characteristics and Medical History

Characteristic	Systolic Function: Preserved (n = 26,322)	Systolic Function: Reduced (n = 25,865)	p*	No LVEF Assessment (n = 45,607)
Age (yrs, mean ± SD)	73.9 ± 13.2	69.8 ± 14.4	<0.0001	72.8 ± 14.1
Women (%)	62	40	<0.0001	51
Admission at academic center (%)	30	35	<0.0001	33
Medicare/Medicaid insurance (%)	80	73	<0.0001	81
African American (%)	17	22	<0.0001	22
Hypertension, CAD, or diabetes (%)	91	88	<0.0001	92
Hypertension (%)	77	69	<0.0001	72
CAD (%)	50	59	<0.0001	61
Diabetes mellitus (%)	45	40	<0.0001	46
Chronic renal insufficiency (%)	26	26	0.98	35
History of heart failure (%)	63	72	<0.0001	86
Prior myocardial infarction (%)	24	36	<0.0001	33
COPD or asthma (%)	31	27	<0.0001	33
Cardiac valvular disease (%)	21	22	0.13	24
Peripheral vascular disease (%)	17	17	0.33	19
Ventricular tachycardia (%)	3	11	<0.0001	10

*Comparison between preserved and reduced systolic function groups.
CAD = coronary artery disease; COPD = chronic obstructive pulmonary disease; LVEF = left ventricular ejection fraction.

Comorbidities : KorAHF registry, 2013

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Variables	EF <40%	EF ≥40%	
Number	962	913	p-value
Mean EF%	27±8	54±10	<0.001
Age	67±14	71±13	<0.001
BMI	23±4	24±4	<0.005
Female	37%	54%	<0.001
Hypertension	54%	63%	<0.001
Diabetes	38%	32%	0.012
Heart failure history	48%	39%	<0.001
Ischemic heart disease	31%	25%	0.003
Atrial fibrillation	22%	31%	<0.001
Chronic lung disease	11%	11%	0.983
Chronic renal failure	15%	13%	0.156
Cerebrovascular disease	14%	16%	0.321

Data from KorAHF registry, 2013

Etiologies of AHF : KorHF registry, 2011

Etiologies	Total N=3,200(%)	Female, n=1,600	Male, n=1,600	P
Ischemic HD	1,544(52.3%)	828(53.6%)	716(46.4%)	<0.001
HTN	1,143(36.7%)	596(38.1%)	547(35.3%)	0.103
Cardiomyopathy	760(26.5%)	351(24.3%)	409(28.8%)	0.007
VHD	407(12.7%)	255(16.4%)	152(9.7%)	<0.001
Myocarditis	22(0.7%)	8(0.6%)	14(1.0%)	0.187
Infiltrative disease	12(0.4%)	5(0.3%)	7(0.5%)	0.545

Data from KorHF registry, Korean Circ J, 2011

EuroHeart Failure Survey- II

세브란스 SEVERANCE

Etiologies

Table 1 Underlying diseases and precipitating factors of EHFS II AHF patients

Characteristics	Total	ADCHF	*De novo* AHF	*P*-value
Number (%)	3580	2251 (62.9%)	1329 (37.1%)	
Age, mean (SD)	69.9 (12.5)	69.5 (12.1)	70.5 (13.1)	<0.01
Male (%)	61.3	63.7	57.3	<0.001
Underlying diseases (%)				
CHD	53.6	62.0	39.4	<0.001
Hypertension	62.5	64.3	59.4	<0.01
Diabetes mellitus	32.8	34.4	30.0	<0.01
Atrial fibrillation/flutter	38.7	46.5	25.4	<0.001
Previous stroke or TIA	13.3	14.7	11.0	<0.01
Valvular disease	34.4	43.8	18.5	<0.001
Renal failure	16.8	20.2	11.0	<0.001
Anaemia	14.7	16.8	11.3	<0.001
Chronic obstructive pulmonary disease	19.3	21.5	15.7	<0.001
Pacemaker implanted	9.1	12.0	4.3	<0.001
Dilated cardiomyopathy	19.3	25.1	9.5	<0.001
Precipitating factors (on admission)				
ACS (%)	30.2	23.1	42.2	<0.001
STEMI	11.1	6.0	19.7	<0.001
Non-STEMI	10.0	7.1	14.8	<0.001
Unstable angina	9.1	9.9	7.7	<0.05
Arrhythmia (%)	32.4	32.5	32.2	NS
Valvular cause (%)	26.8	30.3	20.8	<0.001
Infection (%)	17.6	19.2	15.0	<0.01
Non-compliance with therapy (%)	22.2	31.8	6.9	<0.001

P-value for difference between ADCHF and *de novo* AHF. TIA, transient ischaemic attack. Renal failure defined as any of the following: patient's serum creatinine recurrently >177 μmol/L (>2.0 mg/dL) at present or in the past or patient on dialysis or with renal transplant; anaemia as reported.

Nieminen MS, et al. Euro Heart J, 2006

Table 2 Patients' Characteristics

	Value
Age (mean)	*69.8±13.9*
Women	*1,287 (40.7%)*
BMI	*21.4±3.7*
Prior hospitalization for heart failure	*1,090 (33.5%)*
Underlying disease	
Coronary artery disease	*1,060 (33.5%)*
Cardiomyopathy	*658 (20.8%)*
Valvular disease	*731 (23.1%)*
Hypertensive heart disease	*365 (11.5%)*
Others	*350 (11.1%)*
NYHA functional class at discharge	
I	*920 (29.1%)*
II	*1,966 (62.1%)*
III	*202 (6.4%)*
*LV ejection fraction (mean)**	*42.1±15.8%*
*LVDd (mm)***	*54.4±10.4*
*LAD (mm)***	*43.8±10.3*
*BNP (median)****	*247 (98–534)*
Hypertension	*1,711 (54.1%)*
Dyslipidemia	*814 (25.7%)*
Diabetes mellitus	*993 (31.4%)*
Atrial fibrillation	*1,151 (36.4%)*
Anemia	*1,399 (44.2%)*
Renal failure	*722 (22.8%)*

Clinical Characteristics and Outcome of Hospitalized Patients With Congestive Heart Failure

— Results of the HIJC-HF Registry —

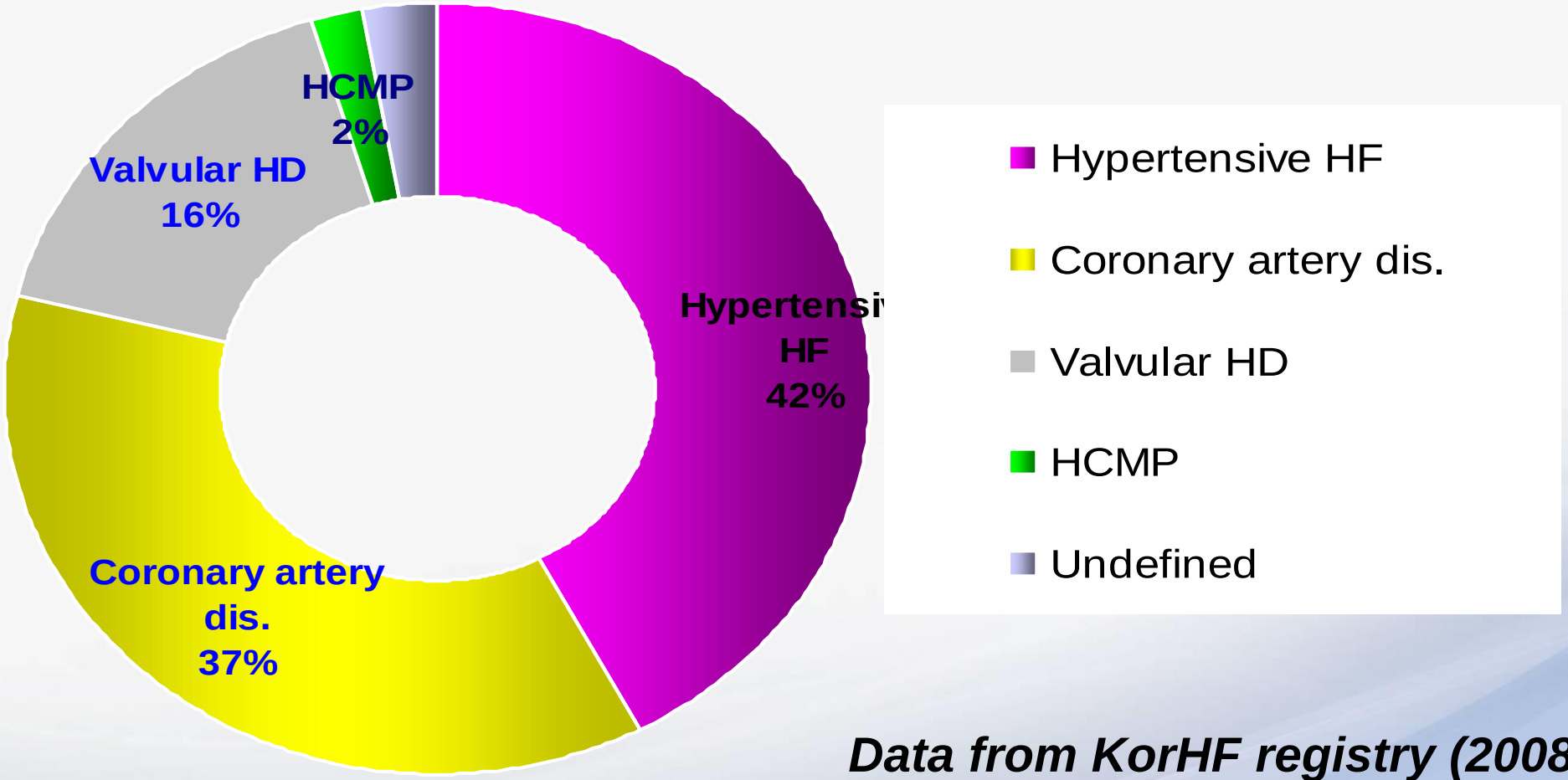
Kawashiro N, et al.
Circ J, 2008

Etiologies of AHF : KorAHF registry, 2013

Variables	EF <40%	EF ≥40%	
Number	962	913	p-value
Mean EF%	27±8	54±10	<0.001
Age	67±14	71±13	<0.001
BMI	23±4	24±4	<0.005
Female	37%	54%	<0.001
Etiology of heart failure			<0.001
Ischemic heart disease	40%	32%	
Valvular heart disease	7%	21%	
Cardiomyopathy	31%	10%	
Hypertensive heart failure	5%	8%	

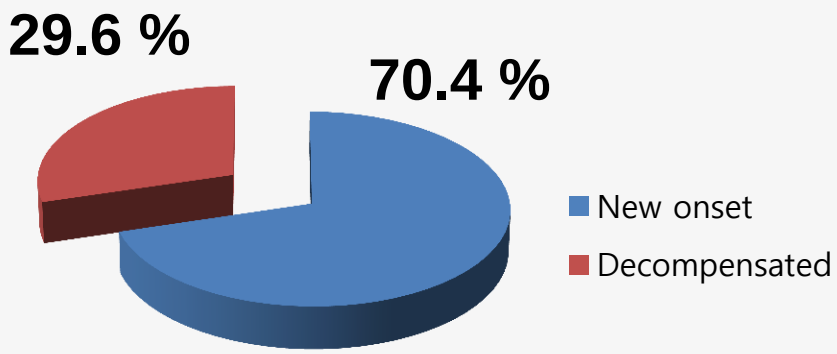
Data from KorAHF registry, 2013

Underlying Diseases in HFPEF

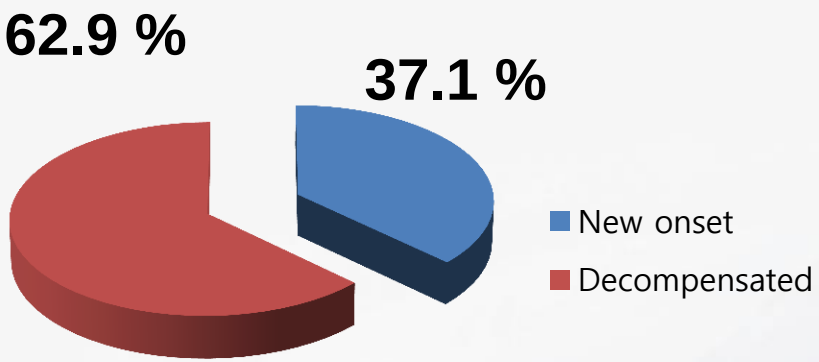


Data from KorHF registry (2008)

New onset vs. decompensated AHF



Data from KorHF registry (Korean Circ J, 2011)



Data from Euro Heart Failure Survey I

Etiologies of AHF : KorAHF registry, 2013

Variables	De novo HF	Worsening chronic HF
Number	1031	1035
Mean EF%	42±16	39±16
Age	68±15	70±13
BMI	24±9	23±8
Female	44.2	46.4
Etiology of heart failure		
Ischemic heart disease	36.9	38.3
Valvular heart disease	8.6	17.9
Cardiomyopathy	19.4	21.8
Hypertensive heart failure	8.2	4.3

Data from KorAHF registry, 2013

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Clinical and Echocardiographic Findings of Newly Diagnosed Acute Decompensated Heart Failure in Elderly Patients

Jeonggeun Moon,[1] Seok-Min Kang,[1,2] In Jeong Cho,[1] Jaewon Oh,[1] Jaemin Shim,[1] Sang-Hak Lee,[1] Yangsoo Jang,[1,2] and Namsik Chung[1,2]

[1]Cardiology Division, Yonsei Cardiovascular Hospital and Cardiovascular Research Institute,
[2]Brain Korea 21 Project for Medical Science, Yonsei University College of Medicine, Seoul, Korea.

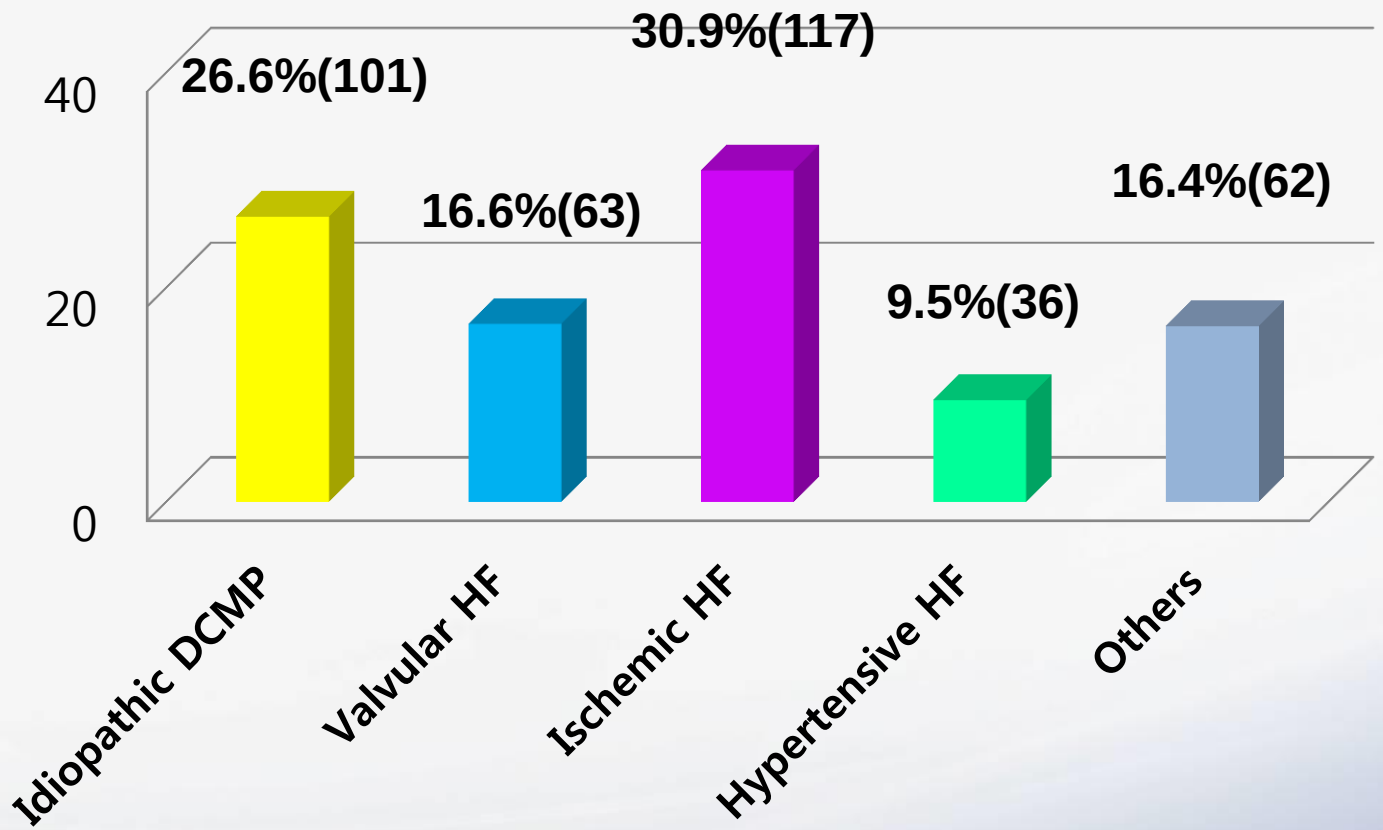
EP : Elderly pts(≥ 65 yrs)
NEP : Non-Elderly pts

Table 1. Intergroup Comparison of Clinical Characteristics and Laboratory Findings

	EPs (n = 135)	NEPs (n = 121)	*p* value
Demographic characteristics			
Age (yrs)	74.0 ± 6.9	50.6 ± 10.8	< 0.001*
Sex (male : female)	58 : 77	86 : 35	< 0.001*
BMI (at admission) (kg/m^2)	22.3 ± 4.5	24.0 ± 4.4	0.003*
ER admission (n, %)	72 (53)	100 (83)	0.016*
LOS (days)	14.6 ± 34.8	11.7 ± 17.8	0.400
Etiology of ADHF			0.015*
Idiopathic DCMP (n, %)	33 (24)	44 (36)	0.045*
Valvular (n, %)	20 (16)	18 (15)	0.843
Ischemic (n, %)	55 (41)	27 (22)	0.002*
Hypertensive (n, %)	11 (8)	8 (7)	0.640
Others (n, %)	15 (11)	24 (20)	0.078
DM (n, %)	45 (33)	26 (21)	0.035*
Hypertension (n, %)	76 (56)	51 (42)	0.024*
Dyslipidemia (n, %)	11 (8)	12 (10)	0.621
CKD (n, %)	36 (27)	21 (17)	0.074
Previous stroke (n, %)	22 (16)	9 (7)	0.030*
Previous myocardial infarction (n, %)	33 (24)	28 (23)	0.087
Atrial fibrillation (n, %)	61 (45)	45 (37)	0.195

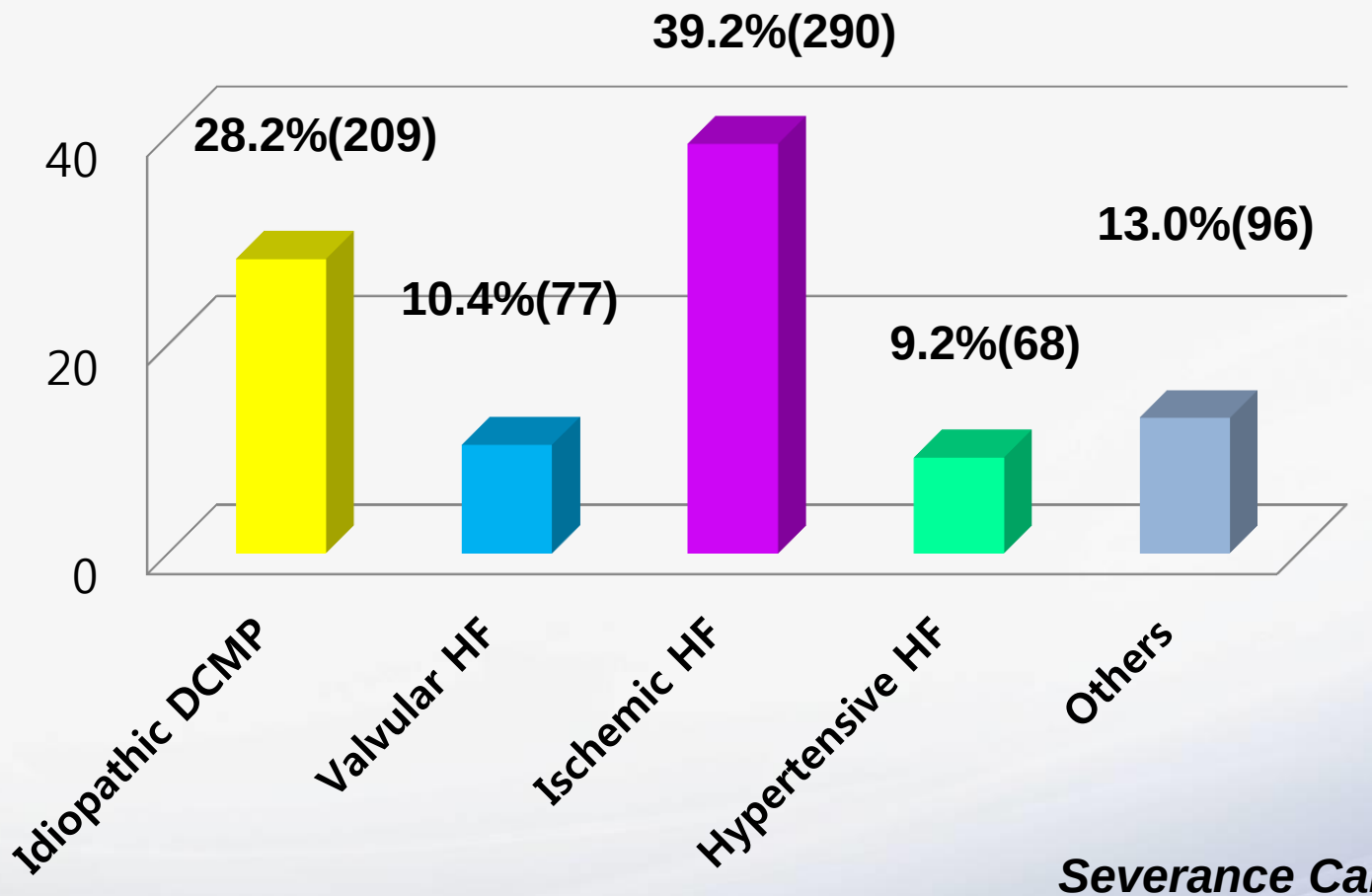
Etiology of AHF (Heart Failure Clinic)

N = 379



Severance Cardiovascular Hospital

Etiology of CHF (Heart Failure Clinic)



N = 740

Severance Cardiovascular Hospital

Characteristics of Etiologies in Korean Heart Failure Patients

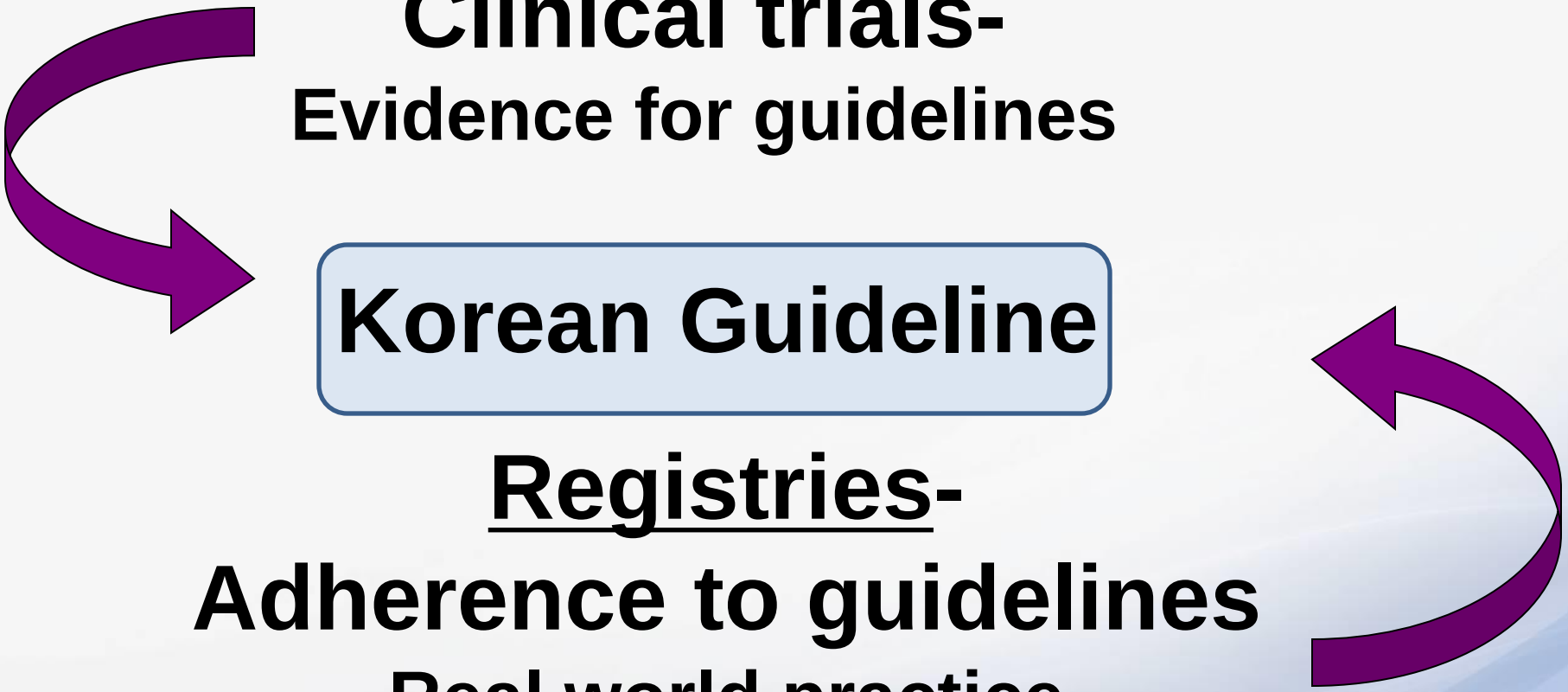
세브란스 SEVERANCE

- Ischemic HD is the most common cause, but relatively lower than western countries
- The prevalence of HFPEF is relatively lower, but higher in women than men
- Elderly patients in AHF have some different etiologies, compared with young patients with AHF
- Some data regarding etiologies are not acceptable

Summary

- Race and ethnic variations for the differences in the etiologies of AHF
- Need well-organized registry data
- Need large-scale prospective RCTs

Lessons from Korean Heart Failure Registries



Appreciate your attention ^^