HeFSSA Practitioners Program 2015 Theme - Women and Heart Failure

- 08:00 08:20 Registration & Breakfast
- 08:20 08:25 Welcome and Thank You to Sponsors
- 08:25 08:30 HeFSSA smartphone patient app (video)
- 08:30 09:15 Implantable devices, women and heart failure
- 09:15 10:00 Peri-partum cardiomyopathy
- 10:00 10:30 Tea Break

11:15 - 11:45

11:45 -12:00

12:00

- 10:30 11:15 Hypertension in pregnancy
 - **Elderly women with Heart Failure**
 - Questionnaire
 - Departure



Elderly women with Heart Failure



"Not now dear, I'm in heart failure"

Advancing age, female sex and heart failure



Mrs IC - history

- 83 y.o. active and independent retired landscape gardener
- Longstanding hypertension on Amlodipine
- June 2014: short history of dyspnoea, palpitations and chest discomfort



Mrs IC – clinical findings

- Overweight elderly lady
- Breathless with normal O₂ saturation on air
- In AF 130/min, JVP +6cm, systolic hypertension, no oedema
- Diffuse wheeze, no crepitation
- Hb 14.5g/dl, Creatinine 55 umol/l, Trop T 30ng/L, NT-pro BNP 4487pg/ml



Modified Framingham clinical criteria for the diagnosis diagnosis of heart failure

Major
Paroxysmal nocturnal dyspnea
Orthopnea
Elevated jugular venous pressure
Pulmonary rales
Third heart sound
Cardiomegaly on chest x-ray
Pulmonary edema on chest x-ray
Weight loss ≥4.5 kg in five days in response to treatment of presumed heart failure*
Minor
Bilateral leg edema
Nocturnal cough
Dyspnea on ordinary exertion
Hepatomegaly
Pleural effusion
Tachycardia (heart rate ≥120 beats/min)
Weight loss ≥4.5 kg in five days
Diagnosis
The diagnosis of heart failure requires that 2 major or 1 major and 2 minor criteria cannot be attributed to another medical condition.

*This criterion was noted in the text of the source paper.

From Senni, M, Tribouilloy, CM, Rodeheffer, RJ, et al, Circulation 1998; 98:2282; adapted from McKee, PA, Castelli, WP, McNamara, PM, Kannel, WB. N Engl J Med 1971; 85:1441.



Mrs IC - ECG





Mrs IC - CXR





Mrs IC - echocardiogram





Mrs IC - echocardiogram





Diastolic HF

- First recognized in 1980's
- Symptoms and signs of HF despite normal LV systolic volumes and function
- Variably and often interchangeably termed HF-nEF, HF-pEF
- Requires:
 - Symptoms and signs of HF
 - EF ≥ 50%
 - Proof of diastolic dysfunction (concentric LVH, AF or raised BNP, ↑ LVEDP and abnormal LV filling)



Definition of Heart Failure*

Classification	Ejection	Description		
	Fraction			
I. Heart Failure with	≤40%	AKA systolic HF or HFrEF. Randomized clinical trials have		
Reduced Ejection		mainly enrolled these patients it is only in this group that		
Fraction (HF <i>r</i> EF)		efficacious therapies have been demonstrated to date.		
II. Heart Failure with	≥50%	AKA diastolic HF. Several different criteria have been used		
Preserved Ejection		to further define HF <i>p</i> EF. The diagnosis of HF<i>p</i>EF is		
Fraction (HFpEF)		challenging because it is largely one of excluding other		
		potential noncardiac causes of symptoms suggestive of HF.		
		To date, no efficacious therapies have been identified.		
a. HF <i>p</i> EF, Borderline	41% to 49%	These patients fall into a borderline or intermediate group.		
		Their characteristics, treatment patterns, and outcomes		
		appear similar to those of patient with HF <i>p</i> EF.		
b. HF <i>p</i> EF, Improved	>40%	It has been recognized that a subset of patients with HFpEF		
		previously had HF <i>r</i> EF. These patients with improvement or		
		recovery in EF may be clinically distinct from those with		
		persistently preserved or reduced EF. Further research is		
		needed to better characterize these patients.		

*2013 ACCF/AHA Guideline for the Management of Heart Failure



HeFFSA definition of Heart Failure

Background. The South African Heart Association (SA Heart) is an affiliate of the European Society of Cardiology (ESC). SA Heart endorses ESC treatment guidelines with modification to suit local circumstances. The Heart Failure Society of South Africa (HeFSSA) is a special interest group of SA Heart. This guideline has been compiled on behalf of the HeFSSA and is based on the ESC guidelines for the diagnosis and treatment of acute and chronic heart failure 2012. The focus is on heart failure with reduced ejection fraction (HF-REF) (i.e. ejection fraction <50%). We have recommended interventions in symptomatic patients with HF-REF in general to clarify the 'grey area' between the ESC guidelines definition of REF (<50%) and the predefined ejection fraction used in randomised heart failure trials (<35%).

Objective. To highlight new changes in the diagnosis and treatment of chronic heart failure with particular emphasis on areas that are relevant to SA. **Conclusions.** Randomised clinical trials are a crucial, but not the only, guide in treating HF-REF patients. There always remain questions that are unanswered and groups of patients not studied, so prudent clinical decisions are required.

S Afr Med J 2013;103(9 Suppl 2):661-667. DOI:10.7196/SAMJ.7319



Heart Failure Classification*

ACC/AHA Stages of HF		NYHA Functional Classification		
A	At high risk for HF but without structural heart disease or symptoms of HF.	None		
В	Structural heart disease but without signs or symptoms of HF.	1	No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF.	
С	Structural heart disease with prior or current symptoms of HF.	I	No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF.	
		11	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in symptoms of HF.	
		111	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes symptoms of HF.	
D	Refractory HF requiring specialized interventions.	- IV	Unable to carry on any physical activity without symptoms of HF, or symptoms of HF at rest (includes PND/orthopnoea).	



*2013 ACCF/AHA Guideline for the Management of Heart Failure

Diastolic HF

- Overall HF prevalence 1.5% in US and Western Europe; HFpEF 50-55% of these
- Often elderly, female, HTN and AF:
 - Estimated ≥70% prevalence in those over age 75
 - >70% female
 - HTN in the majority
 - BMI >30 in 50%
- Account for continued rise in hospital admissions (cf. HF-rEF which are on the decline)



Redfield, M. M. et al. JAMA 2003;289:194-202

New York Heart Failure Consortium - Klapholz M et al. JACC 2004;43:1432

Mrs IC - management

- i.v. Furosemide 40mg bd
- Rate control with Bisoprolol 2.5mg and Digoxin 250mcg od PO
- Reverted to SR within 48 hours
- Admission symptoms consistent with angina, positive Trop T→ angiogram



Etiology of heart failure with preserved ejection fraction



- * Cause of HF or specific target for therapy.
- Disease process that may lead to HF.

Δ May have stage in which EF is normal but often declines.

Reproduced from: Lindenfeld J, Albert NM, Boehmer JP, et al. HFSA 2010 Comprehensive Heart Failure Practice Guideline. J Card Fail 2010; 16:e1. Illustration used with the permission of Elsevier Inc. All rights reserved.



Differential diagnosis of heart failure with preserved left ventricular ejection fraction Diastolic heart failure Hypertensive heart disease Restrictive cardiomyopathy Infiltrative cardiomyopathies Hypertrophic cardiomyopathy Noncompaction cardiomyopathy Coronary heart disease Miscellaneous factors: diabetes mellitus, chronic kidney disease, aging Valvular heart disease Valvular stenosis Valvular regurgitation Right heart failure Pulmonary hypertension Right ventricular infarction Arrhythmogenic right ventricular cardiomyopathy Pericardial disease Cardiac tamponade Constrictive pericarditis Effusive-constrictive pericardial disease Intracardiac mass Atrial myxoma Congenital heart disease High-output heart failure

Episodic or reversible LV systolic dysfunction

Pulmonary vein stenosis

Heart Falure Society

Adapted from: Oh JK, Hatle L, Tajik AJ, Little WC. Diastolic heart failure can be diagnosed by comprehensive two-dimensional and Doppler echocardiography. J Am Coll Cardiol 2006; 47:500.



Diagnostic criteria for diastolic heart failure



Left ventricular concentric hypertrophy or concentric remodeling

Left atrial enlargement (in absence of atrial fibrillation)

Doppler echocardiography or catheterization evidence of diastolic dysfunction

If the two major criteria are met and there is evidence of LV hypertrophy or left atrial enlargement, the diagnosis of definite diastolic heart failure can be made. In the absence of hypertrophy or left atrial enlargement, it can be appropriate to make a tentative diagnosis of probable diastolic heart failure and require confirmatory evidence before making a diagnosis of definite diastolic heart failure. Valvular heart disease should be excluded.

BNP: brain natriuretic peptide; NT-ProBNP: amino-terminal pro-brain natriuretic peptide; LVEDV: left ventricular end-diastolic volume. Original figure modified for this publication. Yturralde RF, Gaasch WH. Diagnostic criteria for diastolic heart failure. Prog Cardiovasc Dis 2005; 47:314. Table used with the permission of Elsevier Inc. All rights reserved.



Diastolic HF - pathophysiology

- Abnormal (slowed) relaxation
- Reduced elasticity (increased myocardial stiffness)
- Increased vascular compliance (aortic stiffness)
- Co-existing systolic dysfunction
- Ventricular dyssynchrony
- Impaired chronotropic response to exercise
- Reduced vasodilator reserve

→ Increased LV diastolic, LA and pulmonary venous pressure



Diastolic HF - pathophysiology





Diastolic HF -



Diastolic HF - diagnosis

- Conventional HF symptoms and signs ensue
- BNP, NTpro-BNP vital (but cannot distinguish HF-pEF from HF-rEF)
- Echo mandatory LVH, RWMA, Amyloid, Valve disease, CP
- Cardiac catheterisation rarely needed (for diagnostic purposes)
- Must exclude non-myocardial causes of HFpEF



Diastolic HF - diagnosis





Mrs IC - echocardiogram





Causes for Elevated BNP Levels*

Са	rdiac	No	ncardiac
•	Heart failure, including RV	•	Advancing age
	syndromes	•	Anemia
•	Acute coronary syndrome	•	Renal failure
•	Heart muscle disease, including	•	Pulmonary causes: obstructive
	LVH		sleep apnea, severe pneumonia,
•	Valvular heart disease		pulmonary hypertension
•	Pericardial disease	•	Critical illness
•	Atrial fibrillation	•	Bacterial sepsis
•	Myocarditis	•	Severe burns
•	Cardiac surgery	•	Toxic-metabolic insults, including
•	Cardioversion		cancer chemotherapy and
			envenomation



*2013 ACCF/AHA Guideline for the Management of Heart Failure

Diastolic HF - Rx

- AF, tachycardia, ischaemia and abrupt rise in BP is poorly tolerated
- No medication proven to modify the course:
 - ARB → improved markers of diastolic dysfunction but not prognosis
 - Spironolactone → reduced HF admissions but did not reduce mortality



Diastolic HF - Rx

- Mainstay of Rx:
 - Diuretics for symptom relief from fluid overload
 - Salt restriction
 - Control BP to ≤140/90mmHg
 - Prevent (statins) and treat ischaemia
 - Maintain SR wherever possible
 - Vaccinations
 - Exercise



HF-pEF* - Rx

Recommendations	COR	LOE
Systolic and diastolic blood pressure should be		
controlled according to published clinical practice	I	В
guidelines		
Diuretics should be used for relief of symptoms due to	1	C
volume overload		
Coronary revascularization for patients with CAD in	lla	
whom angina or demonstrable myocardial ischemia is	Па	C
present despite GDMT		
Management of AF according to published clinical		
practice guidelines for HFpEF to improve symptomatic	lla	С
HF		
Use of beta-blocking agents, ACE inhibitors, and ARBs		C
for hypertension in HFpEF	па	L
ARBs might be considered to decrease	ШЬ	D
hospitalizations in HFpEF		В
Nutritional supplementation is not recommended in	III: No	6
HFpEF	Benefit	L



*2013 ACCF/AHA Guideline for the Management of Heart Failure

Mrs IC - angiogram







Mrs IC - angiogram







Mrs IC - angiogram







Diastolic HF - prognosis

- Prognosis and morbidity no different from HFrEF
 - 20-30% suffer sudd
 - 5% annual mortality

Outcomes in patients with heart failure with preserved, borderline, and reduced ejection fraction in the Medicare population

Richard K. Cheng, MD, MS, ⁶ Margueritte Cox, MS, ^b Megan L. Neely, PhD, ^b Paul A. Heldenreich, MD, MS, ^c Deepak L. Bhati, MD, MPH, ^d Zubin J. Eapen, MD, MHS, ^b Adrian F. Hernandez, MD, MHS, ^b Javred Butler, MD, MPH, ^c Clyde W. Yanoy, MD, MS, ^d and Gregg C. Fonarow, MD⁶ Richmond VA and Durbam, NC





Rate estimates of mortality, all-cause readmission, cardiovascular readmission, and heart failure readmission at 1 year by EF group.

(Am Heart J 2014;168:721-730.e3.)

Mrs IC - discussion

- "Multifactorial" HF:
 - Rapid response AF, ischaemia but NB:
 - preserved LVEF throughout, but clinical, radiographic and biochemical evidence of HF
- Good example of HF-pEF due to diastolic dysfunction



Mrs IC – follow-up

- Readmitted with cough and orthopnoea 2/52 later
- ECG unchanged (but now rate-controlled)
- CXR small pleural effusion
- Echo normal systolic function, no RWMA
- Bloods Pro BNP 2500pg/ml
- Rx Furosemide increased to 40mg bd
- Seen last Jan 2015; NYHA II, stable, in SR



Conclusions

- GPs must be familiar with the spectrum of HF, and that it includes patients with normal EF in echo
- HF-pEF is common and under-recognized
- BNP testing is a highly effective screening tool
- Ongoing research is needed to answer the remaining questions including:
 - prevention
 - non-pharmacological therapy of HF including weight loss
 - pharmacological Rx of HF-pEF
 - management of hospitalized HF
 - effective reduction in HF readmissions
 - more precise use of device-based therapy



HeFSSA Practitioners Program 2015 Theme - Women and Heart Failure

- 08:00 08:20 Registration & Breakfast
- 08:20 08:25 Welcome and Thank You to Sponsors
- 08:25 08:30 HeFSSA smartphone patient app (video)
- 08:30 09:15 Implantable devices, women and heart failure
- 09:15 10:00 Hypertension in pregnancy
- 10:00 10:30 Tea Break

10:30 - 11:15

11:15 - 11:45

11:45 -12:00

12:00

- Peri-partum cardiomyopathy
 - Elderly women with Heart Failure
 - Questionnaire
 - Departure



HeFSSA Practitioners Program 2015: Questionnaire

Please go to <u>www.hefssa.org</u> to complete this year's questionnaire online

