Optimizing CHF Therapy

Jay Geoghagan, MD FACC
BHHI Primary Care Symposium
February 27, 2015
Financial Disclosures

None
Clinical Scenario

R.J. is a new patient to your clinic. He is a 57 yo WM who suffered a heart attack two years ago. He has been hospitalized once since then about 9 months ago. He just moved to the area and has been out of his meds for about three months. He works every day but notes increasing DOE.

PMH – Hypertension

NKDA, Former smoker
Clinical Scenario

Physical Exam
- BP 156/90, Pulse 84 regular
- Clear lungs
- Mild pedal edema

CXR
- Cardiomegaly

EKG
- NSR, Poor R wave progression, NSST changes
Clinical Scenario

What information do we need?
- EF, Lytes, BUN, Cr, BNP
He remembers hearing 30%.
- Cr 1.6, K 4.2
You arrange a cardiology consult and order an ECHO, but what should you do for him now?
Clinical Scenario

- Heart failure stage.
  - A, B, C, D.

- Functional Classification.
  - I, II, III, IV.

Why is this important?

Therapies are driven by this classification.
## Classification of Heart Failure

<table>
<thead>
<tr>
<th>ACCF/AHA Stages of HF</th>
<th>NYHA Functional Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>A At high risk for HF but without structural heart disease or symptoms of HF.</td>
<td>None</td>
</tr>
<tr>
<td>B Structural heart disease but without signs or symptoms of HF.</td>
<td>I No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF.</td>
</tr>
<tr>
<td>C Structural heart disease with prior or current symptoms of HF.</td>
<td>I No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF.</td>
</tr>
<tr>
<td></td>
<td>II Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in symptoms of HF.</td>
</tr>
<tr>
<td></td>
<td>III Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes symptoms of HF.</td>
</tr>
<tr>
<td>D Refractory HF requiring specialized interventions.</td>
<td>IV Unable to carry on any physical activity without symptoms of HF, or symptoms of HF at rest.</td>
</tr>
</tbody>
</table>
Stages, Phenotypes and Treatment of HF

**STAGE A**
At high risk for HF but without structural heart disease or symptoms of HF

- e.g., Patients with:
  - HTN
  - Atherosclerotic disease
  - DM
  - Obesity
  - Metabolic syndrome or
  - Patients using cardiotoxins
  - With family history of cardiomyopathy

**THERAPY**
- **Goals**
  - Heart healthy lifestyle
  - Prevent vascular, coronary disease
  - Prevent LV structural abnormalities

- **Drugs**
  - ACEI or ARB in appropriate patients for vascular disease or DM
  - Statins as appropriate

**STAGE B**
Structural heart disease but without signs or symptoms of HF

- e.g., Patients with:
  - Previous MI
  - LV remodeling including LVH and low EF
  - Asymptomatic valvular disease

**THERAPY**
- **Goals**
  - Control symptoms
  - Improve HRQOL
  - Prevent hospitalization
  - Prevent mortality

- **Drugs**
  - ACEI or ARB as appropriate
  - Beta blockers as appropriate

- **Strategies**
  - Identification of comorbidities

- **Treatment**
  - Diuresis to relieve symptoms of congestion
  - Follow guideline driven indications for comorbidities, e.g., HTN, AF, CAD, DM
  - Revascularization or valvular surgery as appropriate

**STAGE C**
Structural heart disease with prior or current symptoms of HF

- e.g., Patients with:
  - Known structural heart disease and
  - HF signs and symptoms

**THERAPY**
- **Goals**
  - Control symptoms
  - Patient education
  - Prevent hospitalization
  - Prevent mortality

- **Drugs for routine use**
  - Diuretics for fluid retention
  - ACEI or ARB
  - Beta blockers
  - Aldosterone antagonists

- **Drugs for use in selected patients**
  - Hydralazine/isosorbide dinitrate
  - ACEI and ARB
  - Digoxin

- **In selected patients**
  - CRT
  - ICD
  - Revascularization or valvular surgery as appropriate

**STAGE D**
Refractory HF

- e.g., Patients with:
  - Marked HF symptoms at rest
  - Recurrent hospitalizations despite GDMT

**THERAPY**
- **Goals**
  - Control symptoms
  - Improve HRQOL
  - Reduce hospital readmissions
  - Establish patient’s end-of-life goals

- **Options**
  - Advanced care measures
  - Heart transplant
  - Chronic inotropes
  - Temporary or permanent MCS
  - Experimental surgery or drugs
  - Palliative care and hospice
  - ICD deactivation

- **In selected patients**
  - CRT
  - ICD
  - Revascularization or valvular surgery as appropriate

**Heart Failure**

- Development of symptoms of HF

- Refractory symptoms of HF at rest, despite GDMT

-e.g., Patients with:
  - Known structural heart disease and
  - HF signs and symptoms

At Risk for Heart Failure

-e.g., Patients with:
  - HTN
  - Atherosclerotic disease
  - DM
  - Obesity
  - Metabolic syndrome or
  - Patients using cardiotoxins
  - With family history of cardiomyopathy

**THERAPY**
- **Goals**
  - Heart healthy lifestyle
  - Prevent vascular, coronary disease
  - Prevent LV structural abnormalities

- **Drugs**
  - ACEI or ARB in appropriate patients for vascular disease or DM
  - Statins as appropriate
What Do You Do?

What Should we give him first?

A. Digoxin
B. Lisinopril
C. Furosemide
D. Hydralazine
What Do You Do?

What Should we give him first?

A. Digoxin
B. Lisinopril
C. Furosemide
D. Hydralazine
Clinical Scenario

The ECHO shows an EF of 30% with a mildly dilated LV and findings consistent with an ischemic cardiomyopathy.

The cardiology consult doesn’t happen (certainly an insurance problem) and he is back in your office.

He has no new complaints and says he is tolerating lisinopril.
What Do You Do?

What Should we do next?

- A. Increase ACEI dose?
- B. Initiate carvedilol?
- C. Initiate furosemide?
- D. Initiate spironolactone?
- E. All of the above, just not all at once?
Pharmacologic Treatment for Stage C HFrEF

HFrEF Stage C
NYHA Class I – IV
*Treatment:

**Class I, LOE A**
ACEI or ARB **AND**
Beta Blocker

For NYHA class II-IV patients.
Provided estimated creatinine >30 mL/min and K+ <5.0 mEq/dL

For persistently symptomatic African Americans,
NYHA class III-IV

Add

**Class I, LOE C**
Loop Diuretics

For all volume overload,
NYHA class II-IV patients

Add

**Class I, LOE A**
Hydral-Nitrates

For NYHA class II-IV patients.
Provided estimated creatinine >30 mL/min and K+ <5.0 mEq/dL

Add

**Class I, LOE A**
Aldosterone Antagonist
Common Questions

ACEI or ARB?
- ACEI preferred first line based on available data.

Carvedilol vs Metoprolol-ER
- Carvedilol has less metabolic effect.
- Metoprolol-ER may cause less BP decrease.
Common Questions

When do I add spironolactone or eplerenone?

- Aldosterone receptor antagonists are recommended in patients with NYHA class II-IV and who have LVEF of 35% or less to reduce morbidity and mortality. (COR 1, LOE A)
- Creatinine should be 2.5 mg/dL or less in men or 2.0 mg/dL or less in women (or estimated glomerular filtration rate >30 mL/min/1.73m²) and potassium should be less than 5.0 mEq/L.
Hyperkalemia

An Rx for a loop diuretic should not automatically result in an Rx for potassium.

Given that all of these medications have some effect on potassium, levels should be monitored after initiation and dose adjustments.

Hyperkalemia can be lethal.
A Word About Nitrates/Hydralazine

The combination of hydralazine and isosorbide dinitrate is recommended to reduce morbidity and mortality for patients self-described as African Americans with NYHA class III–IV HF refrEF receiving optimal therapy with ACE inhibitors and beta blockers, unless contraindicated (COR I, LOE A).

A combination of hydralazine and isosorbide dinitrate can be useful to reduce morbidity or mortality in patients with current or prior symptomatic HF refrEF who cannot be given an ACE inhibitor or ARB because of drug intolerance, hypotension, or renal insufficiency, unless contraindicated (COR IIa, LOE B).
Medical Therapy for Stage C HFrEF: Magnitude of Benefit Demonstrated in RCTs

<table>
<thead>
<tr>
<th>GDMT</th>
<th>RR Reduction in Mortality</th>
<th>NNT for Mortality Reduction (Standardized to 36 mo)</th>
<th>RR Reduction in HF Hospitalizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE inhibitor or ARB</td>
<td>17%</td>
<td>26</td>
<td>31%</td>
</tr>
<tr>
<td>Beta blocker</td>
<td>34%</td>
<td>9</td>
<td>41%</td>
</tr>
<tr>
<td>Aldosterone antagonist</td>
<td>30%</td>
<td>6</td>
<td>35%</td>
</tr>
<tr>
<td>Hydralazine/nitrate</td>
<td>43%</td>
<td>7</td>
<td>33%</td>
</tr>
</tbody>
</table>
What Role for Digoxin?

- Digoxin can be beneficial in patients with HFrEF, unless contraindicated, to decrease hospitalizations for HF (COR IIa, LOE B).

- Added at low doses (0.125-0.25mg daily) to those already receiving GDMT.

- No mortality benefit.

- Narrow therapeutic range.

- High doses are not recommended.
Clinical Scenario

How does this change if R.J.s ECHO shows mild LVH and an EF of 70%?
- Currently identified as HFpEF. Commonly called “diastolic heart failure.”
- It boils down to BP control per current guidelines and diuresis to euvolemia.
- Standard guideline based management for CAD, valve disease, and atrial fibrillation.
Bottom Line!

ACEI/ARB and BB for all patient with HFrEF.

Diuretics for volume control.

Aldosterone antagonists for appropriate patients.

Combination of Hydralazine and Nitrates for persistently symptomatic patients (especially African Americans).
Bottom Line!

- Digoxin is used for symptomatic patients who are on appropriate GDMT.
- Sodium restriction is often imperative.
- Avoidance of chronic NSAID therapy.
- Effective management of obstructive sleep apnea.
- Exercise and weight loss.
Questions?