Evolution of Ischemic Heart Disease in Females
INOVA Heart and Vascular Institute
2015 Cardiovascular Symposium
April 26, 2015

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DISCLOSURE INFORMATION:
The following relationships exist related to this presentation (*paid to CSMC):
Grant support*: NHLBI, SWHR, Gilead
Consulting*: Amgen, Pfizer
Honorarium*: Gilead, Pri-Med, NAMS, Medscape, Vox Media
Stocks: None
Case

- 40-year-old female s/p hospitalization for acute shortness of breath and chest tightness. EKG showed ST-segment elevations and had a elevated troponin 0.48 (normal <0.04). CT scan showed no evidence of pulmonary emboli. A CCTA showed no obstructive CAD. The patient was discharged from the hospital without specific diagnosis.

- Five years ago, she was diagnosed with a positive ANA which appeared to be borderline. She was later tested and was diagnosed with systemic lupus with a positive ANA.

- She is a para 2 gravida 2, and had hypertension postpartum with both of her sons.

- ECG now has NSSTWs and echo normal WM and EF.

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What is the Diagnosis

1. Non-cardiac
2. Pericarditis
3. Ischemic heart disease (IHD) s/p ACS/AMI
Should she have any further evaluations?

1. Nothing further is needed
2. Exercise stress ECG testing
3. Stress testing with imaging
How should she be treated?

1. Current treatment is fine
2. Indocin and steroids for SLE-pericarditis
3. Add or replace CCB with beta-blocker, add ACE/ARB and intensify statin therapy
The Yentl Syndrome  1991
Women and Heart Disease Deaths
An Alarming Trend...

Cardiovascular Disease Mortality Trends for Males and Females
United States: 1979–97

DEATHS IN THOUSANDS

CALENDAR YEARS

1984-1996: 12 years to recognize / take action
Coronary Artery Disease in Women: Pitfalls in Diagnosis and Management

1. Recognition
2. Diagnosis
3. Management
Coronary Microvascular Dysfunction
Exertional angina
Abnormal SPECT
No obstructive CAD
Abnormal coronary flow reserve and elevated LVEDP
Diffuse atherosclerosis by IVUS

NCDR estimate 3 million women in the US – a larger problem than breast cancer.

*Circulation*. 1999;99:1774
Paradox: Women have a two-fold increase in “normal” coronary arteries in the setting of ACS, nonSTE and STEMI

<p>| Table. Prevalence of “Normal” and Nonobstructive Coronary Arteries in Women Compared With Men |
|----------------------------------|-------------------|------------------|------------------|</p>
<table>
<thead>
<tr>
<th></th>
<th>Women</th>
<th>Men</th>
<th>P Value</th>
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<tbody>
<tr>
<td>Acute coronary syndrome</td>
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<tr>
<td>GUSTO²</td>
<td>343/1768 (19.4)</td>
<td>394/4638 (8.4)</td>
<td>&lt;.001</td>
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<tr>
<td>TIMI 18³</td>
<td>95/555 (17)</td>
<td>99/1091 (9)</td>
<td>&lt;.001</td>
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<tr>
<td>Unstable angina²</td>
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<tr>
<td>TIMI Illa⁶</td>
<td>30/113 (26.5)</td>
<td>27/278 (8.3)</td>
<td>&lt;.001</td>
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<td>MI without ST-segment elevation²</td>
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<td>MI with ST-segment elevation²</td>
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Abbreviations: GUSTO, Global Utilization of Streptokinase and t-PA for Occluded Coronary Arteries; MI, myocardial infarction; TIMI, Thrombosis In Myocardial Infarction.
Coronary Artery Disease in Women: Pitfalls in Diagnosis and Management

1. Recognition – women are less likely to be recognized – change the name to Ischemic Heart Disease (IHD)
2. Diagnosis
3. Management
Angina Classification Does Not Adequately Stratify CAD in Women: Most Symptomatic Women over 50 yrs are at Intermediate Risk (20-50%) and Should be Tested for Ischemia

Symptomatic Women with Suspected IHD

Index IHD Risk Estimate

Intermediate IHD Risk
No Resting ST Segment Abnormalities

ETT First Strategy
Assess Routine ADL or DASI

Limited
Not Limited

Selective Imaging Strategy
Abnormal or Indeterminate ECG

Intermediate High IHD Risk
Resting ST Segment Abnormalities or Functional Disability

Imaging First Strategy
Stress Imaging
CCTA

Intermediate IHD Risk
Limited

Standardized Reporting of Low to High Risk Abnormalities

Low Risk
Abnormal but Non-High Risk
High Risk

Consider CAD Imaging

Index SIHD Management Per Clinical Practice Guidelines

Prognostic Value of Functional Capacity in Women: 5-Year Death Rates

Functional capacity measured in METs is useful in asymptomatic and symptomatic patients.

Duke Treadmill Score: Stratifying Diagnostic Ability

- Patients referred for evaluation of chest pain who underwent exercise treadmill testing and subsequent diagnostic cardiac catheterization (n=3225)
  - Bias regarding selection for catheterization
- Women versus men
  - Duke Treadmill Score
    - 1.6 versus -0.3 (P<0.0001)
  - Significant CAD
    - 32% versus 72% (P<0.001)
  - 2-year mortality
    - 1.9% versus 4.9% (P<0.0001)

The DTS works well in women and men

“What’s the Optimal Method for Ischemia Evaluation in Women (WOMEN)s Trial”:


Imaging is Not Appropriate in Intermediate Risk Women with Normal ECG and Can Exercise

<table>
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<th>Time to Follow-up (in years)</th>
<th>ECG</th>
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Coronary Artery Disease in Women: Pitfalls in Diagnosis and Management

1. Recognition – women are less likely to be recognized – change the name to Ischemic Heart Disease (IHD)

2. Diagnosis – symptomatic women have intermediate risk – test symptomatic women for ischemia/prognosis

3. Management
Women Remain the Majority of Victims and Still Receive Fewer Interventions to Prevent and Treat Heart Disease

- Less cholesterol screening 😣
- Fewer lipid-lowering therapies 😣
- Less use of heparin, beta-blockers and aspirin during myocardial infarction 😣
- Less antiplatelet therapy for secondary prevention 😣
- Fewer referrals to cardiac rehabilitation 😣
- Fewer implantable cardioverter-defibrillators and heart transplants compared to men with the same recognized indications 😣

How to Get Results

• Rename Coronary Artery Disease (CAD) ⇒ Ischemic Heart Disease (IHD)

• A simplified approach to IHD management helps to increase adherence to guidelines

• This can be achieved using an ABC format to present important pharmacologic therapies and lifestyle approaches
Know Your ABCs

• **A**
  - Antiplatelets/anticoagulants*
  - Angiotensin-converting enzyme (ACE) inhibitors/angiotensin-receptor blockers (ARBs)*
  - Antianginals

• **B**
  - Blood pressure control
  - Beta-blocker*

• **C**
  - Cholesterol management (statin)*
  - Cigarette smoking cessation

* 4 Magic Pills- Associated with a 90% reduction in recurrent major adverse cardiac events
Figure  Cox proportional hazard functions for 1-year survival at mean of covariates pre- and post-transition stratified by women vs men.
Guideline Implementation and ACS and the Sex Survival Gap

Following guideline implementation, mortality for women improves and the sex gap narrows (RED).

Figure Cox proportional hazard functions for 1-year survival at mean of covariates pre- and post-transition stratified by women vs men.

Novak et al Am J Medicine 2008;121:602
Guideline Implementation and ACS and the Sex Survival Gap

Following guideline implementation, mortality for women improves and the sex gap narrows (RED).

Persistent sex gap (BLUE) suggests more work still needed to understand sex-specific pathophysiology to improve outcomes for women and men.

**Figure** Cox proportional hazard functions for 1-year survival at mean of covariates pre- and post-transition stratified by women vs men.

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What About Women (and Men) with Female-Pattern Ischemic Heart Disease?

- Remember, IHD ACS/angina guidelines are not “cath” based – treat evidence of ischemia and angina, not the cath

- Abundant evidence exists documenting lifesaving risk reduction of the 4 magic pills (ASA, ACE, BB, statin)

- The power of the prescription pen to implement guidelines therapy preferentially saves women’s lives
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2. Diagnosis – symptomatic women have intermediate risk – test symptomatic women for ischemia/prognosis

3. Management – treat IHD (ACS) and SIHD (angina) in women with guidelines to improve outcomes
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3. Add or replace CCB with beta-blocker*, add ACE/ARB* and intensify statin therapy*

(*plus low dose ASA are the 4 magic pills for reducing mortality post ACS)