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WOMEN AND HEART DISEASE

“NEW UNDERSTANDING”
RECOGNITION, PREVENTION,
DIAGNOSIS, AND TREATMENT

#1 Cause of Death in Women Over 40
22.9 percent of All Deaths in Women
Only 1 in 5 Women Believe Heart Disease is THEIR GREATEST RISK
Disparities in Heart Care for Women

- Under recognized as the leading killer
  - 46% of women are unaware
  - Misperception that ‘it’s a man’s disease’; 36% of women do not perceive themselves as at risk
- Women have poor knowledge of own CAD risk factors
- Underestimate Risk
- Failure to link risk factors to CAD
- 25% report lack of emphasis by health care providers
- Lack of health care provider emphasis on ‘how to’ make lifestyle changes
- Only 53% would call 911 for symptoms

Disparities in Heart Care for Women

- Under diagnosed
  - More subtle symptoms; other symptoms may predominate
  - Women older, more co-morbidities at Dx
  - If symptoms, often not referred for further studies
  - Delays in diagnosis and treatment: When women present to the ER, ACS less likely to be considered initially and long delays in treatment.
  - Women have more atypical symptoms
  - Delays in presenting to the ER and delays being treated
Disparities in CVD Treatment for Women
- 35,835 pts with NSTEMI: 41% women
- Women had:
  - ↑ DM, HTN, age; ↓ CAD events
  - ↓ Early ASA, heparin, GPIIb-IIIa, ACE-I
  - ↓ Revascularizations: CABG ↓41%
  - ↓ Discharge ASA, beta blocker, ACE-I, statins (Four Magic Pills)*
  - ↑ Death, MI, CHF
Associated with a 90% reduction in recurrent major adverse cardiac events

Challenges for Women
- Delays in symptom recognition and treatment
- Misdagnosis
- Lower use of angiography, revascularization, aspirin, beta blockers, statins, angiotensin-converting enzyme inhibitors (ACE-I) (Four Magic Pills)*
- Less counseling and risk factor control
- Fever referrals to cardiac rehab;
  - more "drop-outs"
- Lower adherence to proven guidelines (ACCI/AHA, NCEP, JNC VII, etc)

Myocardial Infarction (MI) Mortality: Largest Gaps in Young Women

- Hospital Mortality (%)
  - Men: 15% Women: 20%
  - Overall: 10%<50 50-54 55-59 60-64 65-69 70-74 75-79 80-84 85-89 Age (years)

* Associated with a 90% reduction in recurrent major adverse cardiac events
Risk Factors Specific to Women

1. OBSTETRICAL COMPLICATIONS
   A. GESTATIONAL HYPERTENSION
   B. PRE-ECLAMPSIA
   C. GESTATIONAL DIABETES
   D. PRE-TERM LABOR
   E. PERSISTENT “BABY WEIGHT” POST 3-12 MONTHS

2. INFERTILITY-ANOVULATION-IRREGULAR PERIODS
   A. POLYCYSTIC OVARY SYNDROME
   B. OBESITY—ELEVATED SERUM INSULIN LEVELS
   C. METABOLIC SYNDROME
Offspring Cardiovascular Disease

Preeclampsia
- Mother: preeclampsia phenotype
- Fetus: IUGR
  - Obesity
  - Insulin resistance
  - Metabolic syndrome
  - Hyperlipidemia
  - Reduced nephron number


PCOS Background

- Stein-Leventhal syndrome
- One of the most common endocrinopathies in women of childbearing age
- Prevalence 4-12%
- Usually brought to clinical attention due to infertility and menstrual irregularities in young women
- Cosmetic issues

“Baby Weight” and Risk of Heart Disease and Diabetes

- Followed 305 Patients for 1 year post partum
- Women who maintained excess pounds between 3-12 months postpartum had elevated risk factors for diabetes and cardiovascular disease
- Women who didn’t lose weight had higher blood pressure, higher levels of LDL, apo B, and greater resistance to insulin (25% of cohort)
- Indirect Evidence that women who don’t lose their “baby weight” are at greater risk for heart disease

Kaw S et al. Diabetes Care 2014
3. VALVULAR HEART DISEASE—DISCOVERED IN PREGNANCY

4. BREAST CANCER
   A. CHEST RADIATION
   B. CHEMOTHERAPY

### CVD Risk Factors in Women

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<th>Prevalence vs Men</th>
<th>Relative Risk vs Men</th>
<th>Sex Specific</th>
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Women’s Hearts ARE Different!

1. Smaller Coronary Vessels
2. More Severe Early Cardiac Disease
3. Microvascular Disease vs. Obstruction??
4. Plaque Erosion/Rupture
5. “Stiffer” Vessels

UNIQUE WOMEN’S CARDIAC PROBLEMS

SPONTANEOUS CORONARY ARTERY DISSECTION (SCAD)
Takotsubo—stress induced cardiomyopathy (CM)

Stress induced cardiomyopathy

- First described 1990 in Japan
- Takotsubo, apical ballooning, broken heart syndrome
MICROVASCULAR DISEASE (MVD)

Sex and Heart Disease: Female Specific Ischemic Heart Disease

Male-pattern
Obstructive CAD

Female-pattern
Microvascular Coronary Disease

HEART FAILURE WITH PRESERVED EJECTION FRACTION
Peripartum Cardiomyopathy

- Onset of heart failure last month of pregnancy or 5 months post partum
- Absence of etiology of CHF
- Absence of demonstrable heart disease before the last month of pregnancy
- Echo demonstrating depressed EF
Was it really an acute coronary syndrome if there was no major angiographic stenosis?

- For decades it has been recognized that angiography may identify no “significantly” diseased artery in some patients with MI, and more patients with unstable angina.
- “Significant” typically defined as ≥50% but this is somewhat arbitrary.
- Uniform terminology: “MINOCA” = MI with Non-Obstructive CAD at Angiography.
DIAGNOSTIC STUDIES AVAILABLE

Limitations of Coronary Angiography
Coronary Artery Spasm

- May contribute to MI with/without atherosclerosis
- Thrombosis likely plays a role
- With or without antecedent vasospastic angina
- Difficult to prove

Which Test to Diagnose and Evaluate Prognosis of Ischemic Heart Disease: Noninvasive Testing Options

- Stress ECG
- Stress ECHO
- Cardiac CT: Coronary
- Cardiac MRI
- Stress Nuclear: SPECT
- CTA: PET

Menopause
Hormone Replacement
Heart Disease
Why Consider Hormone Replacement Therapy?

North American Menopause Society—NAMS
25 Years of Excellent Research

In the United States—
1900—Life Expectancy of Women—50 years
2016—Life expectancy of Women—82 years
32 Years Without Estrogen
So What!!

1. Women have 260 tissues with Estrogen Receptors
2. In women ALL other endocrine organs that ARE DEFICIENT ARE REPLACED 100 PERCENT

Example:
1. Thyroid—10 percent of Menopausal Women Are Hypothyroid
2. Pancreas—Insulin = Diabetes
3. Adrenal Gland—Steroids—Replaced

ESTROGEN—NOT REPLACED!!

RESULT

Therefore: Aging and Estrogen Deficiency
1. Osteoporosis
2. Vaginal atrophy
3. Urinary Incontinence/Urgency
4. Hot Flashes
5. Fat Distribution Visceral Fat
6. ↑ LDL and Lipids
7. Weight Gain
8. Sexual Dysfunction
9. Sleep Disorders
10. Difficult Concentration/Irritability
WHY?

1. Causes Breast Cancer
2. Causes Blood Clots

OR DOES IT?

Breast Cancer—NOT THE CAUSE

1. Aging and Carcinogens Deposited in Fatty Tissue of Breast
2. Increase in Cancer is Same Slope With or Without Estrogen

3. Breast Cancer has Estrogen Receptors
   In the “Best Prognosis” Breast Cancer
4. Stimulation of “Healthy Breast Cells” “Theory”
   A. ↑ Rate of Growth
   B. ↑ Calcification Reaction to the Early Cancer
   C. Calcium Found on Mammogram
   D. Breast Cancer Found Early and Cure Rate Higher
First 10 Years of Estrogen Therapy

↓ Incidence of Breast Cancer
and
Even When Discontinued,
Reduction Continues

Heart Disease/Estrogen
“Timing Hypothesis”
Start Estrogen in Early Menopause
Until 60 years old
Reassess Risks/Benefits at age 60

Most Recent Study
Women Stopping Hormone Therapy
↑ Cardiac Events Post Stopping Hormone Replacement Therapy
At Any Age!
Conclusion:

1. Hormone Replacement Therapy Improves Quality of Life Issues.
2. Most Benefits Up to Age 60 — May be Up to Age 70
3. Significant Improvement in Osteoporosis
4. Assists in Management of Weight gain With Visceral Weight
5. Improves Postmenopausal ↑ in LDL and Lipoproteins
6. No Significant Increases in Incidence of Breast Cancer. NOT CAUSATIVE.
7. Replace Estrogen Transdermal and Does Not ↑ Most Clotting Problems

Risks and Benefits Should Be Carefully Evaluated for Each Patient and Based Upon Their Entire Medical Condition