Gender Specific Protocols for Treatment of Hypertension in Women

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Hypertension

- Affects one out of four Americans
- Affects one out of three adults worldwide (WHO, 2012 Report)
- 2/3 of treated hypertensive women have uncontrolled hypertension
- Leading cause of death in women in every major developed country
- Major risk factor for cardiovascular disease, diabetes mellitus, cerebrovascular accident, chronic renal failure, heart failure and peripheral vascular disease
Research in Women

- In 1970, 9% of clinical trials included women
- In 2006, 34% included women
- National Institutes of Health Revitalization Act-1993
- WISE study, WHI study
Gender specific research

- WISE-Women’s Ischemic Syndrome Evaluation
- WHI-Women’s Health Initiative
- SWAN-Study of Women’s Health Across the Nation
- American Heart Association – CVD preventative guidelines
Literature Review

Gender differences

- Blood pressure is less prevalent in younger women when age-matched with men, but become similar when >65 years of age and older.
- Sex-linked patterns of disease have been identified:
  - Women have a more intense immune response
  - Proposal of microvascular coronary disease in women
  - Age-matched rats differ in exercise response
  - The renin-angiotension system may play a significant role
Racial differences

- Chinese patients were found to have a different response to propranolol than Caucasian patients due to a more rapid metabolism of the drug.
- Asian Indians and Koreans were found to have an increased sensitivity to nifedipine.
- African Americans are found more responsive to thiazide diuretics and less responsive to ACE inhibitors and Beta Blockers.
- Hispanic Americans response to medication similar to Caucasians.
Age and Menopausal Status

- Blood pressure increases after age 65 for women. Until that age, HTN more prevalent in men (70% in age > 65 years, 80% in age > 75 years)
- There is no firm evidence that menopause is a risk factor, although some studies have found differences between postmenopausal and premenopausal renin-angiotensin systems
Evaluation of Best Practices

- Guidelines utilized

- JNC-7 - Key points
  - B/P <140/90
  - Thiazide-type diuretics used first in uncomplicated HTN, alone or combined with drugs from other classes
  - ACE or ARB should be used initially in DM, usually need two or more drugs to achieve target B/P
  - Most patients will need two or more drugs to achieve target B/P
Guidelines, continued

Effectiveness Based Guidelines for the Prevention of Cardiovascular Disease in Women: 2011 Update - Key Points

- Drug therapy indicated when B/P is > 140/90 ( >130/90 in the setting of CRF or DM)
- Thiazides are recommended first line
- Beta-blockers and/or ACE/ARB recommended initial treatment of high risk women with CAD, with the addition of thiazides, if needed.
Study Design

- Sample: 100 women, convenience sample
- Setting: cardiovascular practice in Southeast Missouri
- Inclusion criteria: DX of essential hypertension, benign (ICD-9 code 401); on anti-hypertensive medication, female
- Exclusion criteria: renal artery stenosis, inability to ascertain menopausal status or race
Outcome Measures

- Outcome measures: to evaluate for best practices utilizing current guidelines
  - B/P controlled -140/90 or less
  - Diabetic patients on an ACE or ARB, if no contraindications
  - Development of gender specific guidelines for treatment of HTN in women
Data collection

- Retrospective chart review
  - A convenience sample of the first 100 charts that met the inclusion criteria were examined and data reviewed.
  - DX: Essential Hypertension, benign (ICD-9 code 401)
  - Treatment with antihypertensive medications: Beta-Blocker, ARB, ACE Inhibitor, CCB, Alpha Blockers, and Diuretics.
  - Variables: age, race, menopausal status, and co-morbidities of CAD and DM.
Analytical Methods

- Descriptive
- Bivariate
- Correlational Analyses
Results

- 100 women
  - 95% White
  - 5% African American
Results

- Mean age = 72.5 years
- Menopausal = 96%
- Diabetes Mellitus = 33%
- CAD = 57%
Results - medications utilized

Bar chart showing the utilization of different types of medications:
- Beta Blocker
- ACE
- ARB
- CCB
- Diuretic
- Alpha Blocker
Evidence for Best Practices

- Out of 100 women, 76% were found to have controlled HTN, compared to the national rate of 64%, and the national rate of 23% in women aged 80 years or greater.

- Out of 100 women, 33 were diagnosed with DM; and 54% of those were on an ACE or ARB, as compared to the national rate of 43%.

- Out of 100 women, 73% were on two or more medications.
Limitations

- Little variation in race, ethnicity, or age in sample
- Race was ascertained by patient photo
- Retrospective study-subject to interpretive bias by investigator
- Small convenience sample
- Further research recommended on gender specific clinical trials
Gender Specific Protocols
Non drug therapies

- Dietary sodium restriction
- Weight loss
- Smoking cessation
# Gender Specific Protocols

<table>
<thead>
<tr>
<th>Women who are or have...</th>
<th>Initial</th>
<th>adding if needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncomplicated HTN</td>
<td>Thiazide diuretic</td>
<td></td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>ACE/ARB</td>
<td>Thiazide diuretic</td>
</tr>
<tr>
<td>Over age 65 or menopausal</td>
<td>ACE/ARB</td>
<td>Thiazide diuretic, then beta blocker if CAD present</td>
</tr>
<tr>
<td>CAD</td>
<td>Diuretic, beta-blocker</td>
<td>ACE/ARB</td>
</tr>
<tr>
<td>African</td>
<td>Thiazide diuretic, Calcium channel blocker</td>
<td>ACE/ARB</td>
</tr>
<tr>
<td>Asian</td>
<td>Calcium channel blocker</td>
<td>Thiazide diuretic</td>
</tr>
<tr>
<td>Caucasian/Hispanic</td>
<td>Thiazide diuretic</td>
<td>Beta Blocker, ACE/ARB</td>
</tr>
</tbody>
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References

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