Systolic Hypertension in the Elderly

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The world population is aging

United Nations 1999
Blood pressure and cardiovascular risk in the elderly (Framingham Study)

Vokonas et al 1988

Blood pressure and cardiovascular risk in the elderly (Framingham Study)
Facts

• > 70 % of the population above 60s are hypertensives.

• ISH accounts for > 80% of HTN above 60s

• Physicians still undertreating systolic hypertension.
Many Patients Are Not at JNC VI–Recommended Blood Pressure Goals (NHANES III)

<table>
<thead>
<tr>
<th>Patient Type</th>
<th>Goal BP</th>
<th>% not at goal SBP</th>
<th>% not at goal DBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncomplicated hypertension</td>
<td>&lt;140/90 mm Hg</td>
<td>64</td>
<td>26</td>
</tr>
<tr>
<td>African American</td>
<td>&lt;140/90 mm Hg</td>
<td>61</td>
<td>37</td>
</tr>
<tr>
<td><strong>Older patients</strong></td>
<td>&lt;140/90 mm Hg</td>
<td><strong>78</strong></td>
<td>9</td>
</tr>
<tr>
<td><strong>Diabetic</strong></td>
<td>&lt;130/85 mm Hg</td>
<td><strong>81</strong></td>
<td>24</td>
</tr>
</tbody>
</table>

Includes those aged 17+ years with diagnosed and undiagnosed hypertension.
SBP, But Not DBP, Increases Throughout Life

- With age, SBP increases, while DBP tends to decline
  - SBP increases in linear fashion
  - DBP rises less steeply, plateaus, and declines slightly after the seventh decade

Comparison of Aortic Pulse-Wave Velocity Between Normal Subjects in different age groups

Elderly patients with HTN, compared to younger hypertensives have:

- Lower cardiac output
- Reduced plasma renin activity.
- Higher peripheral resistance
- Increased LV mass.
**Elevated SBP Alone Is Associated With Increased Risk of Cardiovascular and Renal Disease**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Relative Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kidney failure (ESRD)</td>
<td>≥2.8</td>
</tr>
<tr>
<td>Stroke</td>
<td>≥2.7</td>
</tr>
<tr>
<td>Heart failure</td>
<td>≥1.5</td>
</tr>
<tr>
<td>Peripheral vascular disease</td>
<td>≥1.8</td>
</tr>
<tr>
<td>Myocardial infarction*</td>
<td>=1.6</td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>≥1.5</td>
</tr>
</tbody>
</table>

ESRD = end-stage renal disease; SBP ≥165 mm Hg.

*Men only.

## SBP-Associated Risks: MRFIT

### SBP versus DBP in Risk of CHD Mortality

<table>
<thead>
<tr>
<th>Systolic BP (mm Hg)</th>
<th>Diastolic BP (mm Hg)</th>
<th>CHD Death Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;70</td>
<td>100+</td>
<td>80.6</td>
</tr>
<tr>
<td>70–74</td>
<td>90–99</td>
<td>71.8</td>
</tr>
<tr>
<td>75–79</td>
<td>80–89</td>
<td>71.8</td>
</tr>
<tr>
<td>80–89</td>
<td>75–79</td>
<td>71.8</td>
</tr>
<tr>
<td>85</td>
<td>70–74</td>
<td>71.8</td>
</tr>
<tr>
<td>9.2</td>
<td>&lt;70</td>
<td>71.8</td>
</tr>
<tr>
<td>9.2</td>
<td>&lt;120</td>
<td>71.8</td>
</tr>
<tr>
<td>120–139</td>
<td>&lt;120</td>
<td>71.8</td>
</tr>
<tr>
<td>140–159</td>
<td>&lt;120</td>
<td>71.8</td>
</tr>
<tr>
<td>160+</td>
<td>&lt;120</td>
<td>71.8</td>
</tr>
</tbody>
</table>

Adapted from Neaton JD et al. *Arch Intern Med.* 1992;152:56-64.
The Risk of CHD Rises With SBP (MRFIT)

Age-adjusted CHD death rates per 10,000 person-years by level of SBP of men screened in MRFIT

Adapted from Neaton JD et al. Arch Intern Med. 1992;152:56-64.
Stroke more common than MI in hypertension trials

Kjeldsen et al 2001
Risk of Stroke Death According to SBP and DBP in MRFIT

Clinical trials document importance of controlling elevated SBP to prevent cardiovascular disease

– SHEP (Systolic Hypertension in the Elderly Program)

– Syst-Eur (Systolic Hypertension in Europe)
Systolic Hypertension in the Elderly Program (SHEP)

Objective: To determine whether antihypertensive drug treatment reduces risk of total stroke in older patients with elevated SBP

Design: Multicenter, randomized, double-blind, placebo-controlled

Patients: 4736 patient, >60 years of age with SBP 160–219 mm Hg and DBP <90 mm Hg

Treatments:
- Step 1–chlorthalidone (12.5 mg/day, doubled if SBP goal not achieved)
- Step 2–atenolol (25 mg/day, added if maximal Step 1 drug dosage ineffective)
- Step 2 dosage doubled if SBP goal not achieved at follow-up
- Placebo

Follow-up: 4.5 years

Endpoint: Total stroke

*P=.0003 vs placebo.

Objective: To determine whether antihypertensive treatment reduces cardiovascular complications in older patients with elevated SBP

Patients: 4695 patients, ≥60 years of age, with SBP 160–219 mm Hg and DBP <95 mm Hg

Treatments:
- Nitrendipine (10–40 mg/day) with possible addition or substitution of
  - Enalapril (5–20 mg/day)
  - Hydrochlorothiazide (12.5–25 mg/day)
- Placebo

Follow-up: 2 years (median)

Endpoint: Total stroke
Myocardial infarction

Syst-Eur: Outcomes

Risk Reduction

<table>
<thead>
<tr>
<th>Event</th>
<th>Percent Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>-42*</td>
</tr>
<tr>
<td>All Cardiac Endpoints</td>
<td>-26†</td>
</tr>
<tr>
<td>Heart Failure</td>
<td>-29‡</td>
</tr>
<tr>
<td>MI</td>
<td>-30‡</td>
</tr>
<tr>
<td>All Fatal/Nonfatal Cardiac Endpoints</td>
<td>-31§</td>
</tr>
</tbody>
</table>

*P=.003; †P=.03; ‡P=.12; §P<.001.

Risk reduction in isolated systolic hypertension in older patients

Meta-analysis of 8 trials

<table>
<thead>
<tr>
<th>Event</th>
<th>Risk Reduction (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total mortality</td>
<td>-13%</td>
</tr>
<tr>
<td>CV mortality</td>
<td>-18%</td>
</tr>
<tr>
<td>Fatal + nonfatal events</td>
<td>-26%</td>
</tr>
<tr>
<td>Stroke</td>
<td>-30%</td>
</tr>
<tr>
<td>Coronary events</td>
<td>-23%</td>
</tr>
</tbody>
</table>

N = 15,693 patients

Management

• ISH is always difficult to control

• Target BP is <140/90 irrespective of the age

• 10/4 mmHg fall reduce the risk of CV events by a third

• Treating HTN in very elderly (> 80 y) will reduce morbidity

but not mortality
Non-drug

(Life style modification)

- Salt restriction
- Weight reduction
- Exercise
- Stop smoking
Drugs

- Thiazide diuretics
- Long acting dihydropyridine CCB (avoid short acting)
- ACEI is not superior to diuretics in the elderly (STOP-2)
- BB is less effective than other drugs (MRC and LIFE)
- Potent vasodilators are better avoided
Tips and Tricks

* Reduced cognitive function
  
  *Use simple fixed dose combinations better once daily*

* Reduced taste sensitivity
  
  *Stress salt restriction and intake of fresh foods*

• Comorbidities
  
  *May influence the choice of your treatment strategy*

• Postural Hypotension
  
  *Measure BP supine and standing*
Tips and Tricks con,

* Polypharmacy

* Pay attention to other other medicines (NSAIDs)

* Lowering diastolic pressure with controlling systolic blood pressure

  Start low and go slow

  • Pseudo hypertension

    Use Osler`s maneuver
Conclusions

** ISH in the elderly is not a benign disease that is even more predictive of CV morbidity and mortality than diastolic HTN**

** ISH is always difficult to control with many tricks to be kept in mind**

** Lowering BP in the Elderly has greater absolute benefit in terms of preventing stroke, or coronary events compared with younger patients.**
** Conclusions con,

** Diuretics are still the first choice drug in uncomplicated patients, as it is effective, safe, and cheap.

** Other drug classes may be employed in the presence of Concomitant diseases

** Always start low and go slow with your drugs