Clinical Practice Guideline: Executive Summary


A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines

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Disclosures:

NONE
Objectives:

• Understanding high risk nature of diabetes with hypertension

• Evaluation of the new ADA guidelines in this special high-risk population

• Review of the data supporting changes in new hypertension guidelines

• Take home messages for clinical practice
HYPERTENSION GUIDELINES: RISK FACTOR TARGETING

Entire population
- High risk
- Low risk

All have diabetes
“considered high risk”
Healthy capillaries

60,000 miles of blood vessels in humans

Damaged
WHAT IS THE EVIDENCE TO SUPPORT TREATMENT OF ELEVATED BLOOD PRESSURE


Effects of intensive blood-pressure lowering and low-dose aspirin in patients with hypertension: principal results of the Hypertension Optimal Treatment (HOT) randomised trial

Lennart Hanson, Alberto Zanchetti, S George Cunha-Reis, Björn Dahlof, Dag Elmfeldt, Stevo Julius, José Ménard, Karl Henrik Rahn, Hans Wachtel, Sven Westerling for the HOT Study Group

Summary

Background: Despite treatment, there is often a higher incidence of cardiovascular complications in patients with hypertension than in nonhypertensive individuals. Inadequate reduction of their blood pressure is a likely cause, but the optimum target blood pressure is not known. The impact of acetylsalicylic acid (aspirin) has never been investigated in patients with hypertension. We aimed to assess the optimum target diastolic blood pressure and the potential benefit of a low dose of acetylsalicylic acid in the treatment of hypertension.

Methods: 18,790 patients, from 26 countries, aged 50–80

Results: Blood pressures were safe, with a 51% reduction in the target group (≤80 mmHg) compared with the control group. Lowering of blood pressure was more effective in reducing major cardiovascular events compared with 40% in the placebo group and 12% versus 70% non-fatal major blood events in the two groups, respectively (p=0.012).

Interpretation: Intensive lowering of blood pressure in patients with hypertension was associated with a low rate of cardiovascular events. The HOT Study shows the

Subpopulation with diabetes, an intensive diastolic target was associated with a significantly reduced risk (51%) of CVD events

18,790 participants, including 1,501 with diabetes

Intensive arm

Diastolic blood pressure target: ≤80 mmHg

Control arm

Diastolic blood pressure target: ≤90 mmHg

Summary: no cardiovascular benefit with more intensive targets

Felodipine-ACEI-BB-Diuretic

Lower diastolic is better
<table>
<thead>
<tr>
<th>Trial</th>
<th>N</th>
<th>Duration</th>
<th>Mean BP, less intense</th>
<th>Mean BP, more intense</th>
<th>Initial Therapy</th>
<th>Outcome</th>
<th>Risk Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHEP (Curb 1996)</td>
<td>583</td>
<td>5 years</td>
<td>155/72*</td>
<td>143/68*</td>
<td>Chlorthalidone</td>
<td>Stroke CVD events CHD</td>
<td>22% (ns), 34%, 56%</td>
</tr>
<tr>
<td>Syst-Eur (Tuomilehto 1999)</td>
<td>492</td>
<td>2 years</td>
<td>162/82</td>
<td>153/78</td>
<td>Nitrendipine</td>
<td>Stroke CV events</td>
<td>69%, 62%</td>
</tr>
<tr>
<td>HOT (Hansson 1998)</td>
<td>1,501</td>
<td>3 years</td>
<td>144/85*</td>
<td>140/81*</td>
<td>Felodipine</td>
<td>CV events MI Stroke CV mortality</td>
<td>51%, 50%, 30% (ns), 67%</td>
</tr>
<tr>
<td>UKPDS (UKPDS 1999a)</td>
<td>1,148</td>
<td>8.4 years</td>
<td>154/87</td>
<td>144/82</td>
<td>Captopril or atenolol</td>
<td>Diabetes-related endpoints: deaths: Strokes Microvascular</td>
<td>34%, 32%, 44%, 37%</td>
</tr>
<tr>
<td>ABCD (Estacio 2000)</td>
<td>470</td>
<td>5.3 years</td>
<td>138/86</td>
<td>132/78</td>
<td>Nisoldipine or enalapril</td>
<td>Ccr Albuminuria Retinopathy Neuropathy Mortality MI, CVA, CHF</td>
<td>nc, nc, nc, 49%, ns</td>
</tr>
</tbody>
</table>
Effects of Intensive Blood-Pressure Control in Type 2 Diabetes Mellitus

The ACCORD Study Group*

METHODS
A total of 4733 participants with type 2 diabetes were randomly assigned to intensive therapy, targeting a systolic pressure of less than 120 mm Hg, or standard therapy, targeting a systolic pressure of less than 140 mm Hg. The primary composite outcome was nonfatal myocardial infarction, nonfatal stroke, or death from cardiovascular causes. The mean follow-up was 4.7 years.

Systolic blood pressure target: <120 mmHg
Achieved (mean) systolic/diastolic: 119.3/64.4 mmHg

Control
Systolic blood pressure target: 130–140 mmHg
Achieved (mean) systolic/diastolic: 133.5/70.5 mmHg

Targeting a systolic blood pressure of less than 120 mm Hg, as compared with less than 140 mm Hg, did not reduce the rate of a composite outcome of fatal and nonfatal major cardiovascular events.

- Stroke risk reduced 41% with intensive control, not sustained through follow-up beyond the period of active treatment
- Adverse events more common in intensive group, particularly elevated serum creatinine and electrolyte abnormalities

## ACCORD medications

<table>
<thead>
<tr>
<th>Medications</th>
<th>Overall (N=4733)</th>
<th>Intensive Therapy (N=2362)</th>
<th>Standard Therapy (N=2371)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antiotensin-converting enzyme (ACE) inhibitor (%)</td>
<td>52.1</td>
<td>52.9</td>
<td>51.3</td>
<td>0.26</td>
</tr>
<tr>
<td>Angiotensin receptor blocker (ARB) (%)</td>
<td>16.9</td>
<td>16.2</td>
<td>17.6</td>
<td>0.19</td>
</tr>
<tr>
<td>ACE or ARB (%)</td>
<td>68.2</td>
<td>68.4</td>
<td>68.1</td>
<td>0.85</td>
</tr>
<tr>
<td>Any thiazide type diuretic (%)</td>
<td>26.1</td>
<td>25.3</td>
<td>27.0</td>
<td>0.18</td>
</tr>
<tr>
<td>Beta-blocker (%)</td>
<td>25.5</td>
<td>26.2</td>
<td>24.8</td>
<td>0.27</td>
</tr>
<tr>
<td>Calcium Channel Blocker (%)</td>
<td>18.5</td>
<td>19.2</td>
<td>17.7</td>
<td>0.18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical trial</th>
<th>Population</th>
<th>Intensive</th>
<th>Standard</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADVANCE BP (43)</td>
<td>11,140 participants with T2D aged 55 years and older with prior evidence of CVD or multiple cardiovascular risk factors</td>
<td>Intervention: a single-pill, fixed-dose combination of perindopril and indapamide</td>
<td>Control: placebo</td>
<td>• Intervention reduced risk of primary composite end point of major macrovascular and microvascular events (9%), death from any cause (14%), and death from CVD (18%)&lt;br&gt;• 6-year observational follow-up found reduction in risk of death in intervention group attenuated but still significant (134)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Achieved (mean) systolic/diastolic: 136/73 mmHg</td>
<td>Achieved (mean) systolic/diastolic: 141.6/75.2 mmHg</td>
<td></td>
</tr>
<tr>
<td>SPRINT (19)</td>
<td>9,361 participants without diabetes</td>
<td>Systolic blood pressure target: &lt;120 mmHg&lt;br&gt;Achieved (mean): 121.4 mmHg</td>
<td>Systolic blood pressure target: &lt;140 mmHg&lt;br&gt;Achieved (mean): 136.2 mmHg</td>
<td>• Intensive systolic blood pressure target lowered risk of the primary composite outcome 25% (MI, acute coronary syndrome, stroke, heart failure, and death due to CVD)&lt;br&gt;• Intensive target reduced risk of death 27%&lt;br&gt;• Intensive therapy increased risks of electrolyte abnormalities and acute kidney injury</td>
</tr>
</tbody>
</table>
CLOSING COMMENTS

Initial treatment for hypertension should include drug classes demonstrated to reduce cardiovascular events in patients with diabetes:

ACE inhibitors (65,66)
Angiotensin receptor blockers (ARBs) (65,66)
Thiazide-like diuretics (67)
Dihydropyridine CCBs (68)
SPECIAL SUBGROUPS WITH DIABETES

 Patients with albuminuria (urine albumin-to-creatinine ratio [UACR] >30 mg/g creatinine)

ACE inhibitor or ARB in order to reduce the risk of progressive kidney disease

No albuminuria, risk of progressive kidney disease is low, and ACE inhibitors and ARBs have not been found to afford superior cardioprotection when compared with other antihypertensive agents

B-Blockers may be used for the treatment of coronary disease or heart failure but have not been shown to reduce mortality as blood pressure-lowering agents in the absence of these conditions
Initial BP between 140/90 mmHg and 160/100 mmHg:
- Start one agent
  - Albuminuria*:
    - No: Start one drug:
      - ACEi
      - ARB
      - CCB***
      - Diuretic**
    - Yes: Start:
      - ACEi or ARB

Initial BP ≥ 160/100 mmHg:
- Lifestyle management
  - Albuminuria*:
    - No: Start drug from 2 of 3 options:
      - ACEi or ARB
      - CCB***
      - Diuretic**
    - Yes: Start:
      - ACEi or ARB
      - CCB*** or Diuretic**

Assess BP Control and Adverse Effects