Assessing and Treating the Afro-Caribbean and Asian Hypertensive Patient

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Prevalence of hypertension is high

Prevalence of hypertension in people aged 20 years and older

Hypertension: Size of the Problem - Global Prospects

- **2000**
  - Established market economies: 116.2 (Men) + 123.3 (Women)
  - Former socialist economies: 40.6 (Men) + 52.5 (Women)
  - India: 60.4 (Men) + 57.8 (Women)
  - Latin America and the Caribbean: 60.0 (Men) + 54.3 (Women)
  - Middle eastern crescent: 35.9 (Men) + 37.9 (Women)
  - China: 98.5 (Men) + 83.1 (Women)
  - Other Asia and islands: 38.4 (Men) + 33.0 (Women)
  - Sub-Saharan Africa: 38.2 (Men) + 41.6 (Women)

- **2025**
  - Established market economies: 147.9 (Men) + 161.8 (Women)
  - Former socialist economies: 44.0 (Men) + 59.7 (Women)
  - India: 107.3 (Men) + 106.2 (Women)
  - Latin America and the Caribbean: 102.1 (Men) + 98.5 (Women)
  - Middle eastern crescent: 72.2 (Men) + 80.4 (Women)
  - China: 151.7 (Men) + 147.5 (Women)
  - Other Asia and islands: 67.3 (Men) + 62.1 (Women)
  - Sub-Saharan Africa: 73.6 (Men) + 77.1 (Women)
<table>
<thead>
<tr>
<th></th>
<th>European n = 1515</th>
<th>South Asia n = 1421</th>
<th>African-Caribbean n = 209</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median SBP mmHg</td>
<td>121</td>
<td>126</td>
<td>128</td>
</tr>
<tr>
<td>Median DBP mmHg</td>
<td>78</td>
<td>82</td>
<td>82</td>
</tr>
<tr>
<td>BMI</td>
<td>25.9</td>
<td>25.7</td>
<td>26.3</td>
</tr>
</tbody>
</table>
Socio Economic Status (SES) and Blood Pressure (BP)

- Lower SES is associated with (modestly) higher mean BP’s in almost all studies in developed countries.

- This inverse gradient is both stronger and more consistently found in women than men.

- A substantial part of the SES gradient is accounted for by BMI.
SMR for stroke in England and Wales, by country of birth

- Bangladesh
- West Africa
- Jamaica
- Republic of Ireland
- Pakistan
- Other Caribbean
- East Africa
- India
- Northern Ireland
- Scotland
- England and Wales
- Italy

- Men
- Women

SMR for CHD in England and Wales, by country of Birth
Management of hypertension: the issues

• Measurement
• Classification
• Investigations
• Risk assessment
• Non-pharmacological measures
• Treatment thresholds
• Drug therapy - 1st line
  - sequencing
  - beyond BP
• Treatment targets
• Concomitant therapy
Management of hypertension: the issues

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  - beyond BP
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- Concomitant therapy
INVESTIGATIONS

• Routine  - ECG
           - FBC
           - E&C, LFT’s, bone profile etc
           - F. Lipids
           - F. Glucose
           - Urinary dipstix

• Secondary Hypertension
           - Urinary catechols / metanephrins
           - CT adrenals
           - Renal angiogram
           - Renin : Aldo ratio

• Others  - ABPM
           - Echo
Management of hypertension: the issues

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- **Risk assessment**
- Non-pharmacological measures
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Nondiabetic Women

Non-smoker

Age under 50 years

Age 50 - 59 years

Age 60 years and over

Smoker

CVD risk <10% over next 10 years
CVD risk 10-20% over next 10 years
CVD risk >20% over next 10 years

SBP = systolic blood pressure mmHg
TC : HDL = serum total cholesterol to HDL cholesterol ratio

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Management of hypertension: the issues

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Lifestyle measures: BHS IV

- Maintain normal weight for adults (body mass index 20-25 kg/m²)
- Reduce salt intake to <100 mmol/day (<6g NaCl or <2.4 g Na⁺/day)
- Limit alcohol consumption to ≤3 units/day for men and ≤2 units/day for women
- Engage in regular aerobic physical exercise (brisk walking rather than weight lifting) for ≥30 minutes per day, ideally on most of days of the week but at least on three days of the week
- Consume at least five portions/day of fresh fruit and vegetables
- Reduce the intake of total and saturated fat
Management of hypertension: the issues

- Measurement
- Classification
- Investigations
- Risk assessment
- Non-pharmacological measures
- **Treatment thresholds**
  - Drug therapy
    - 1st line
    - sequencing
    - beyond BP
- Treatment targets
- Concomitant therapy
Management of hypertension: the issues

- Measurement
- Classification
- Investigations
- Risk assessment
- Non-pharmacological measures
- Treatment thresholds
- **Drug therapy** - 1st line
  - sequencing
  - beyond BP
- Treatment targets
- Concomitant therapy
# First-line Therapy

<table>
<thead>
<tr>
<th></th>
<th>JNC 7</th>
<th>ESH–ESC</th>
<th>WHO–ISH</th>
<th>BHS/NICE 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiazide-type</td>
<td>Any of 5 (A,A,B,C,D)</td>
<td>Low-dose diuretics</td>
<td></td>
<td>A/CD</td>
</tr>
<tr>
<td>diuretics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-drug</td>
<td>2-drug combination</td>
<td></td>
<td>_</td>
<td>_</td>
</tr>
<tr>
<td>combination</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compelling</td>
<td>Compelling indication for</td>
<td>Compelling indication for</td>
<td>Compelling indication for</td>
<td></td>
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<tr>
<td>indication for</td>
<td>others</td>
<td>others</td>
<td>others</td>
<td>others</td>
</tr>
<tr>
<td>others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The table above summarizes the recommendations for first-line therapy as per various guidelines including JNC 7, ESH–ESC, WHO–ISH, and BHS/NICE 2006. The guidelines recommend the use of thiazide-type diuretics as the initial choice, followed by 2-drug combination therapy, with a compelling indication for others.
Choosing drugs for patients newly diagnosed with hypertension: NICE/BHS

Abbreviations:
A = ACE inhibitor
(consider angiotensin-II receptor antagonist if ACE intolerant)
C = calcium-channel blocker
D = thiazide-type diuretic

Black patients are those of African or Caribbean descent, and not mixed-race, Asian or Chinese patients

- Younger than 55 years
  - A
  - A + C or A + D
  - A + C + D

- 55 years or older or black patients of any age
  - C or D

Step 1: A
Step 2: A + C or A + D
Step 3: A + C + D
Step 4: Add
- further diuretic therapy
- alpha-blocker
- beta-blocker
Consider seeking specialist advice

NICE/BHS algorithm: June 2006
Differential effects of anti-hypertensive drugs by age and race younger blacks

*p=0.003
Differential effects of anti-hypertensive drugs by age and race

Older blacks

*p=0.001
### Subgroups: Lisinopril vs Chlorthalidone

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>1° endpoint</th>
<th>Tot mortality</th>
<th>Stroke</th>
<th>Comb CHD</th>
<th>Comb CVD</th>
<th>CHF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>-</td>
<td>-</td>
<td>✔️</td>
<td>-</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>&lt;65 years</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>✔️</td>
</tr>
<tr>
<td>≥65 years</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Men</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Women</td>
<td>-</td>
<td>-</td>
<td>✔️</td>
<td>-</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Black</td>
<td>-</td>
<td>-</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Non-black</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>✔️</td>
</tr>
<tr>
<td>Diabetic</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>✔️</td>
</tr>
<tr>
<td>Non-diabetic</td>
<td>-</td>
<td>-</td>
<td>✔️</td>
<td>-</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>
Observed BP differences on monotherapy

<table>
<thead>
<tr>
<th></th>
<th>Atenolol monotherapy</th>
<th>Amlodipine monotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>SBP diff</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td><strong>Europeans</strong></td>
<td>2,098</td>
<td>-1.6(19.6)</td>
</tr>
<tr>
<td><strong>Afro-origin</strong></td>
<td>102</td>
<td>4.5(19.8)</td>
</tr>
<tr>
<td><strong>South Asians</strong></td>
<td>57</td>
<td>-3.5(18.4)</td>
</tr>
</tbody>
</table>
### Observed BP differences on dual-therapy

<table>
<thead>
<tr>
<th>Dual therapy</th>
<th>Adding Thiazide</th>
<th>Adding Perindopril</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>SBP diff</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>n</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Europeans</td>
<td>1309</td>
<td>-10.6(16.7)</td>
</tr>
<tr>
<td>Afro-origin</td>
<td>73</td>
<td>-12.0(17.5)</td>
</tr>
<tr>
<td>South Asians</td>
<td>42</td>
<td>-5.1(17.7)</td>
</tr>
</tbody>
</table>
Summary & conclusions

• There are clinically significant differences in BP response to monotherapy, as well as to the addition of second line antihypertensive drugs among ethnic groups

  – Compared to other ethnic groups, black African-origin patients responded poorly to atenolol monotherapy

  – Highly significant differences in response among ethnic groups on addition of perindopril to amlodipine were seen: Compared to white Caucasians, black Africans responded poorly and the South Asians responded considerably better

  – In contrast SBP lowering response on diuretic addition was statistically similar among 3 ethnic groups, but there were indications that as compared to Caucasians, blacks may respond more, and south-Asians may respond less well
Ethnic Groups
Afro-Caribbean Blacks

- Hypertension common (50% in > 40 year olds)
- High risk of complications (stroke, renal failure, LVH)
- Sensitive to salt restriction
- More responsive to diuretics, CCBs
- Less responsive to ACE inhibitors and β-blockers as mono therapy
Ethnic Groups
British South Asians

- Hypertension common
- High prevalence of type II diabetes
- Aggressive management of associated risk factors
- Implications for differential drug choice?

- BP and CVD in developing countries
- Alternative BP measurement
- BP lowering in high risk patients
- More versus less BP lowering
- Evaluation of surrogate end-points
- Combined interventions for CVD prevention
- Effects of newer BP lowering agents
- Genetically targeted BP lowering therapy
Combinations OPALS as a crossover

Randomised patients

A + C → C + D → A + D
A + D → A + C → C + D
C + D → A + C → A + D

In India and Africa and China?

Hughes AD et al.