Management of High Blood Pressure in Blacks

CHCANYS 2014 Clinical Committee Face-to-Face Meeting
June 9, 2014

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Hypertension in Blacks remains a public health and clinical challenge

- Among all hypertensive Blacks in the U.S., only 46% achieved BP control to <140/<90 mmHg in 2007 – 2008

- It is estimated that up to 30% of all deaths in hypertensive black men and 20% of deaths in hypertensive black women may be a result of high blood pressure

- The high prevalence of concomitant obesity, diabetes, albuminuria, cardiovascular and renal disease in Blacks with hypertension amplifies absolute risk for clinical complications and contributes to treatment resistance

Age Adjusted Heart Disease Death Rates by Race/Ethnicity: U.S. 1990-2006

Rate per 100k Standard Population

Date


Black or African American
Non-Hispanic white
Hispanic
Asian or Pacific Islander

Racial Disparity

Pub Health Rep. 2010;125:689
Nearly one in three U.S. adults has hypertension: Prevalence of 33.5%

Rates of Blood Pressure Control Are Low

*Blood pressure <140/90 mmHg in non-diabetic patients or <130/80 mmHg in diabetic patients

THE OPTIMAL BLOOD PRESSURE GOAL REMAINS UNCLEAR
Cardiovascular mortality risk doubles with each 20/10 mmHg BP increment*

SBP = systolic blood pressure; DBP = diastolic blood pressure

*Individuals aged 40-69 years, starting at blood pressure (untreated) 115/75 mmHg
The concept of “high BP or hypertension” is both relative and arbitrary

- Pressure-related CVD risk is continuous and graded across a broad range and doubles with every 20/10 mmHg rise in blood pressure over 115/75 mmHg

- Absolute coronary risk, defined by the Framingham 10-year CHD risk score, should be incorporated into the decision-making process on when and how aggressively to treat

- An important aim of lowering BP targets to <135/<85 mmHg for primary prevention and <130/<80 mmHg for secondary prevention is to increase the proportion of patients who achieve contemporary BP goals

Effect of Modest BP Reductions on Stroke and IHD Mortality in Middle-Aged Persons

<table>
<thead>
<tr>
<th>REDUCTION IN SBP mmHg</th>
<th>Stroke</th>
<th>IHD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>-10</td>
<td>-7</td>
</tr>
<tr>
<td>10</td>
<td>-40</td>
<td>-30</td>
</tr>
</tbody>
</table>

Approaches to Hypertension
Screening and Referral for
Specialty Care
Potentially Useful Screening Strategies for the Detection, Evaluation and Treatment of Hypertension

Referral Algorithm

1. Based on BP thresholds
2. Should be an infrequent triage option
Absolute Imperatives for a Well Functioning Hypertension Screening Program

• Personnel trained in BP measurement

• Simple BP measurement protocol
  – Specific BP measurement conditions (e.g., quiet room, legs uncrossed, arm at heart height supported on a table)
  – Accurate, calibrated equipment
  – Multiple BP cuff sizes

• Provider Referral Network (can be a highly sensitive issue)

• Written, explicit follow-up instructions including the BP reading(s) from the screening and conditions (e.g., time of day, medications taken or not)
Determining the Need for Emergency Evaluation and Treatment of High Blood Pressure

• The need for emergent evaluation / treatment rarely depends solely on the BP level

• Signs\(^1\) that an elevated BP level requires emergent evaluation
  – Chest pain / back pain
  – Shortness of breath
  – Slurred speech
  – Focal neurological signs (unilateral weakness)
  – Syncope or near syncope

• A BP of 170 / 90 with one or more of the above symptoms is an emergency while a BP of 240 / 100 mm Hg in an asymptomatic person is not

\(^1\)Selected signs
Locating a Specialist in Clinical Hypertension

www.ash-us.org

Click on HTN Specialist Directory

Then search the directory by city and state

1As certified by the American Society of Hypertension (ASH)
Prudent Patient Referrals for Specialized Hypertension Evaluation, Consultation and Treatment

• Criteria should include:
  – BP threshold
  – Intensity of treatment (e.g., number of drugs)
  – Duration of BP elevation
  – Co-morbidities (e.g., heart failure, diabetic retinopathy)

• Example:

• Refer for specialty care if BP remains either > 160 systolic and / or > 15 mm Hg above SBP goal for more than 4 months\(^1\) while taking at least 3 antihypertensive medications of different classes.

\(^1\)Refer sooner if diabetic retinopathy or heart failure present.
Review of Prospective Trials that have Prospectively Targeted “Optimal” Blood Pressure as a Primary Objective
Greater CV Outcomes Benefit in Diabetes Patients who Achieved Lower Diastolic BP (HOT Study)

Diabetes Subgroup

Goal of therapy: target diastolic BP

- ≤90 mmHg (n=501)
- ≤85 mmHg (n=501)
- ≤80 mmHg (n=499)

Achieved

- ≤90 → 85.2 mmHg
- ≤85 → 83.2 mmHg
- ≤80 → 81.1 mmHg

HOT Study: Risk of a Major CV Event Based on Achieved Diastolic BP

(Benefit plateaus at ~86.7 mmHg)

Achieved DBP (mmHg)

<table>
<thead>
<tr>
<th>Achieved DBP (mmHg)</th>
<th>% Risk Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>105</td>
<td>-5</td>
</tr>
<tr>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>95</td>
<td>0</td>
</tr>
<tr>
<td>90</td>
<td>0</td>
</tr>
<tr>
<td>85</td>
<td>0</td>
</tr>
<tr>
<td>80</td>
<td>0</td>
</tr>
</tbody>
</table>

ACCORD: Effect Intensive BP Control on Primary Outcome and Components

![Graph showing the comparison of intensive and standard blood pressure control over years post-randomization.](graph.png)

<table>
<thead>
<tr>
<th></th>
<th>Intensive Events</th>
<th>Standard Events</th>
<th>HR (95% CI)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>208</td>
<td>237</td>
<td>0.88 (0.73-1.06)</td>
<td>0.20</td>
</tr>
<tr>
<td>CV Death</td>
<td>60</td>
<td>58</td>
<td>1.06 (0.74-1.52)</td>
<td>0.74</td>
</tr>
<tr>
<td>Nonfatal MI</td>
<td>126</td>
<td>146</td>
<td>0.87 (0.68-1.10)</td>
<td>0.25</td>
</tr>
<tr>
<td>NonfataI Stroke</td>
<td>34</td>
<td>55</td>
<td>0.63 (0.41-0.96)</td>
<td>0.03</td>
</tr>
</tbody>
</table>

### Evidence of Benefit with Slightly Lower Achieved BP in Lower Risk Patients (Secondary Analysis)

<table>
<thead>
<tr>
<th>TRIAL</th>
<th>PATIENT POPULATION</th>
<th>BP ATTAINED</th>
<th>OUTCOMES</th>
</tr>
</thead>
</table>
| **Treatment of Mild HTN Study** *(JAMA. 1993;270:713)* | M/F aged 45-69 yrs; baseline BP 140/91 mmHg, randomized to:  
• BP meds+lifestyle modification OR  
• Lifestyle modification alone | SBP ≈126 mmHg  
SBP ≈132 mmHg | Clinical event rates:  
11.1% vs.  
16.2% (p=0.03) |
| **Cardio-Sys** *(Lancet. 2009;374:525)* | Non-diabetic M/F; SBP ≥150 mmHg + 1 additional CV risk factor:  
• Tight control (SBP <130 mmHg) OR  
• Usual control (SBP <140 mmHg) | At 2 yrs  
131.9/74.0 (tight control)  
135.6/78.7 (usual control) | Rate of ECG-LVH at 2 yrs  
• 37% lower with tight control (p=0.013)  
Rate of CVD at 2yrs  
• 4.8% (tight) vs. 9.4% (usual) (p=0.003) |
| **Trial of Preventing Hypertension** *(N. Engl J Med. 2006; 354:1685)* | Prehypertensive M/F; mean age 48.5 yrs randomized to:  
• BP med treatment (ARB) OR  
• Placebo | Treatment reduced HTN onset by:  
• 66.3% (p<0.001) at 2yr  
• 15.6% (p<0.007) at 4yr |
| **ALLHAT** *(JAMA 2002;288:2981-97)* | 33,357 M/F; average BP at enrollment 146/84 mmHg or 156/89 mmHg if untreated:  
• Chlorthalidone vs. lisinopril vs. amlodipine | At 4.9 yrs:  
134.1/75.5 (C)  
134.7/74.7 (A)  
136.0/75.5 (L) | No difference primary CHD outcome. Pre-specified secondary outcomes were equivalent between C and A; however, combined CVD risk and stroke were lower in C vs. L\(^1\) |

\(^1\)Heart Failure, a component of the pre-specified combined CVD endpoint, was more effectively reduced with C than with A or L.
A recommended strategy to achieve BP Goal

<table>
<thead>
<tr>
<th>RISK CATEGORY</th>
<th>RECOMMENDATION</th>
<th>TARGET BP</th>
</tr>
</thead>
<tbody>
<tr>
<td>In patients with BP ≥135/85 mmHg <strong>without</strong> target organ damage†, preclinical CVD‡ or CVD§</td>
<td>Lifestyle Modification (up to 3 months without drugs) + Drug Therapy</td>
<td>&lt;135/&lt;85 mmHg</td>
</tr>
<tr>
<td>In patients with BP ≥130/80 mmHg <strong>with</strong> target-organ damage†, preclinical CVD‡ or CVD§</td>
<td>Lifestyle Modification + Drug Therapy</td>
<td>&lt;130/&lt;80 mmHg</td>
</tr>
</tbody>
</table>

†albumin: creatinine ratio >200 mg/g, eGFR<60 mL/min/1.73 m², or ECG or echo LVH

‡metabolic syndrome, Framingham risk score >20%, impaired fasting glucose [100-125 mg/dL] and/or impaired glucose tolerance [2-hr glucose 140-199 mg/dL], diabetes mellitus

§heart failure (systolic or diastolic), CHD/post-MI, PAD, stroke, TIA and/or abdominal aortic aneurysm

*Hypertension*. 2010;56:780-800.
In-depth Patient Evaluation

• History
  – Family, previous diagnosis of high BP, smoking, alcohol intake, diet/exercise, environment, street drug usage, comorbidities, etc.

• Diagnostic testing
  – EKG, Lytes, BUN, creatinine, glucose, eGFR, Fasting lipid profile, Framingham 10-y CHD risk score, random spot urine albumin:creatinine or protein:creatinine ratio, etc.

• CXR; special situations
  – Specific chest-related symptomatology (eg cough), unexplained shortness of breath, long-standing poor BP control, etc.

• Physical examination
  – Height, weight, waist circumference, funduscopcopy, etc.
COMBINATION THERAPY IS THE PREFERRED APPROACH FOR THE MAJORITY OF BLACK PATIENTS
Guide to multidrug antihypertensive therapy in blacks with hypertension. Aldo indicates aldosterone; non-DHP, nondihydropyridine.
For secondary prevention, most patients will require a multi-drug regimen

- Multiple risk factors, target organ damage, and clinical cardiovascular and renal disease places patients at higher CVD risk for a given level of BP

- Most patients will require multiple antihypertensive drugs to maintain consistent BP control at $<130/<80$ mmHg
  - Target organ injury/pre-clinical CVD have been linked to treatment resistance or slower goal attainment

- Complex, multi-drug regimens may limit BP goal achievement

- Follow a strategy of titrating drugs every 3-4 weeks until BP is below goal
Treatment-related differences in outcomes *may be* due to differences in BP lowering

- Thiazide diuretics and CCBs have comparable effect on BP lowering and clinical outcomes *except* that thiazide diuretics are more effective for primary prevention of heart failure

- For reduction in cardiovascular events, RAS-blockers fall short of thiazide diuretics and CCBs as initial therapy in black patients

- Thiazide diuretics or CCBs are favored over RAS-blocking agents as *initial therapy* for lowering cardiac morbidity and mortality in hypertensive black patients without a compelling indication

- In patients with a compelling indication for use of a RAS-blocking agent, combination with a diuretic and/or a CCB will usually be required to achieve target blood pressure

*CHF, CVD, CKD, diabetes

Primary Prevention Treatment Algorithm

BP ≥135/85 but with no target-organ injury,* preclinical CVD,† or CVD‡
Goal BP <135/85 mmHg

YES

BP <145/90 mmHg?

YES

Optional lifestyle modifications for up to 3 months

NO

BP >15/10 mmHg above goal?

YES

Combination Therapy
Preferred: CCB + RAS blocker or Thiazide + RAS blocker§
Alternative: Thiazide + Beta-blocker or Thiazide + CCB
Optional: Thiazide + Aldosterone antagonist

NO

Preferred: Diuretic or CCB
Alternative: RAS blocker
Optional: Beta-blocker

BP <135/85 mmHg?

YES

Monitor

NO

Intensify treatment every 4-6 weeks

BP <135/85 mmHg?

YES

Preferred: Diuretic or CCB
Alternative: RAS blocker
Optional: Beta-blocker

NO

NOTE: The most-effective 2-drug combinations are: CCB + RAS blocker; thiazide diuretic + RAS blocker; thiazide diuretic + aldosterone antagonist; thiazide diuretic + beta-blocker. Recommended RAS blockers are ACE inhibitors, or ARBs for patients unable to tolerate ACE inhibitors. *Target-organ injury is defined as albumin:creatinine ratio >200 mg/g, eGFR <60 mL/min/1.73 m², or electrocardiographic or echocardiographic evidence of LVH. †Indicators of preclinical CVD include metabolic syndrome, Framingham risk score >20%, prediabetes (impaired fasting glucose [100-125 mg/dL] and/or impaired glucose tolerance [2-hr postload glucose ≥140 mg/dL]), or diabetes mellitus. ‡CVD includes heart failure (systolic or diastolic), coronary heart disease/post myocardial infarction, peripheral arterial disease, stroke, transient ischemic attack, and/or abdominal aortic aneurysm. §Preferred combination therapy in edematous and/or volume overload states.
Secondary Prevention Treatment Algorithm

BP $\geq$130/80 with target-organ injury,* preclinical CVD,† and/or CVD‡
Goal BP <130/80 mmHg

BP >15/10 mmHg above goal?

- **YES**
  - Combination Therapy
    - Includes drug(s) with compelling indication

- **NO**
  - Use agent with compelling indication or
    - Preferred: Diuretic or CCB
    - Alternative: RAS blocker
    - Optional: Beta-blocker

BP <130/80 mmHg?

- **YES**
  - Monitor

- **NO**
  - Intensify treatment every 4-6 weeks

*Target-organ injury is defined as albumin:creatinine ratio >200 mg/g, eGFR <60 mL/min/1.73 m², or electrocardiographic or echocardiographic evidence of LVH.

**Hypertension.** 2010;56:780-800.

NOTE: The most-effective 2-drug combinations are: CCB + RAS blocker; thiazide diuretic + RAS blocker; thiazide diuretic + aldosterone antagonist; thiazide diuretic + beta-blocker. Recommended RAS blockers are ACE inhibitors, or ARBs for patients unable to tolerate ACE inhibitors. *Target-organ injury is defined as albumin:creatinine ratio >200 mg/g, eGFR <60 mL/min/1.73 m², or electrocardiographic or echocardiographic evidence of LVH.
## Therapeutic Class Considerations by Comorbidity

<table>
<thead>
<tr>
<th>Condition</th>
<th>Treatment Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHD/Angina</td>
<td>ACE-inhibitor (I) or ARB, β-blocker, CCB</td>
</tr>
<tr>
<td>CKD</td>
<td>ACE-I or ARB</td>
</tr>
<tr>
<td>Diabetes</td>
<td>ACE-I or ARB, CCB</td>
</tr>
<tr>
<td>Heart Failure</td>
<td>ACE-I or ARB, β-blocker, aldosterone antagonist</td>
</tr>
<tr>
<td></td>
<td><em>Contraindicated: Non-dihydropyridine CCBs in systolic HF</em></td>
</tr>
<tr>
<td>Post-MI</td>
<td>ACE-inhibitor or ARB, β-blocker</td>
</tr>
<tr>
<td>Post-Stroke</td>
<td>ACE-inhibitor or ARB, diuretic</td>
</tr>
</tbody>
</table>
## Undesirable Antihypertensive Drug Combinations

<table>
<thead>
<tr>
<th>Combination</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE inhibitor + ARB</td>
<td>Modest incremental BP lowering when one is added to the other</td>
</tr>
<tr>
<td></td>
<td>Heightened risk for hyperkalemia and kidney dysfunction</td>
</tr>
<tr>
<td></td>
<td>No incremental reduction in pressure-related CVD risk</td>
</tr>
<tr>
<td></td>
<td>Increased hypotensive symptoms</td>
</tr>
<tr>
<td>β-blocker + ACE Inhibitor</td>
<td>Minimal incremental BP lowering (in the absence of a diuretic)</td>
</tr>
<tr>
<td>β-blocker + nondihydropyridine CCB</td>
<td>Risk of both bradycardia and depressed LV systolic function, especially in older persons</td>
</tr>
<tr>
<td>β-blocker + central adrenergic inhibitor (eg, clonidine)</td>
<td>Modest incremental BP lowering</td>
</tr>
<tr>
<td></td>
<td>Significant risk of bradycardia and orthostatic hypotension</td>
</tr>
<tr>
<td>α-blocker + central adrenergic inhibitor</td>
<td>Significant risk for orthostatic hypotension</td>
</tr>
<tr>
<td></td>
<td>Both agents antagonize the sympathetic nervous system</td>
</tr>
</tbody>
</table>

LV indicates left ventricular.
In-depth Patient Evaluation

- **History**
  - Family, previous diagnosis of high BP, smoking, alcohol intake, diet/exercise, environment, street drug usage, comorbidities, etc.

- **Diagnostic testing**
  - EKG, Lytes, BUN, creatinine, glucose, eGFR, Fasting lipid profile, Framingham 10-y CHD risk score, random spot urine albumin:creatinine or protein:creatinine ratio, etc.

- **CXR; special situations**
  - Specific chest-related symptomatology (eg cough), unexplained shortness of breath, long-standing poor BP control, etc.

- **Physical examination**
  - Height, weight, waist circumference, funduscopy, etc.
ISHIB Consensus Statement

Highlights

• Reduction of target BP to <135/<85 mmHg for Blacks with ‘uncomplicated’ hypertension

• Maintain BP goal of <130/<80 mmHg in Blacks with cardiovascular disease, chronic kidney disease, or diabetes

• Greater focus on multiple-drug regimens, especially single-pill, fixed-dose combinations, as initial therapy with preference for RAS blocker/CCB unless edema or volume overload is present

• Focus on quantifying and managing multiple risk factors with a treatment plan including evidence-based pharmacotherapy and therapeutic lifestyle change to minimize the burden of cardiovascular and renal disease
The ISHIB Consensus Statement Practical Application

THE IMPACT/CV TOOLKIT PILOT STUDY: RATIONALE, RESULTS AND IMPLICATIONS FOR IMPROVING OUTCOMES
Barriers to Blood Pressure & Lifestyle Modification and Drug Treatment

**Provider**
- Lack of agreement with clinical guidelines
- Therapeutic inertia
- Confidence to implement strategies

**Patient**
- Demographic characteristics
  - Age
- Psychological factors
  - Health beliefs
  - Health literacy
  - Self-efficacy
- Social/cultural factors
  - Socioeconomic status
  - Cultural values

**Environment**
- Access to care
  - Lack of insurance
  - Lack of transportation
- Features of practice setting
  - Lack of visit time
  - Lack of office support

**Therapy Related**
- Adverse effects
- Cost
- Complexity of regimen

**Patient – Provider Relationship**

**Effect of healthcare system on practice**

**Compatibility of regimen with patient lifestyle**

**Availability of resources for treatment**

*Postgrad Med. 2009;121-159*
The ISHIB Cardiovascular Risk Reduction Toolkit (IMPACT) study*

- Part of a comprehensive strategy to improve health of African Americans with HTN
- ISHIB 2010 consensus statement
  - Emphasis on comprehensive therapeutic lifestyle changes
- To translate recommendations for HTN management to community practices

*A Pilot Study Evaluating a Community-based Intervention Focused on the ISHIB IMPACT Cardiovascular Risk Reduction Toolkit in African American Patients with Uncontrolled Hypertension was submitted for publication on November 14th, 2013 to The Journal of Clinical Hypertension*
Pilot Study

- A community-based educational intervention*
  - Evaluate BP control with ISHIB IMPACT cardiovascular risk reduction toolkit
  - 6 month, randomized, controlled study
  - Targeted African Americans with uncontrolled hypertension
  - Recruited during routine clinical visits at two physician offices (cardiology and primary care) in Baltimore, MD

* IRB approval obtained from the University of Maryland School of Medicine: HIPAA compliant and prior patient consent was obtained
Study Population

• Inclusion Criteria
  – Adults, aged 18-64 years
  – Uncontrolled hypertension at screening (SBP <170/110 mm Hg)
  – BMI ≤37 kg/m²
  – Hemoglobin A1c (HbA1c) <6.5%
  – Estimated GFR > 55 mL/min/1.73m²
• All participants were African American
Study Procedure

**Triage nurse:**
- Identified potentially eligible patients

**Community health worker/hypertension educator:**
- Determined eligibility
- Randomized patients to intervention or usual care
- Obtained appropriate consent

**Usual care group**
- Recruitment and monthly visits:
  - Assessments
  - BP measurements*
  - Pulse
  - Adverse events

**Recruitment visit:**
- Assessments
  - Weight
  - Height
  - BP measurements*
  - Pulse
  - Screening/medical history forms
  - Quality of life questionnaire (SF-12)

**Educational intervention**
- ISHIB Cardiovascular Toolkit reviewed by a community health worker†
- Toolkit components were:
  - Omron Blood Pressure Cuff
  - Meal Measure Portion Control Plate
  - Leslie Sansone Walking DVD
  - Pedometer
  - Patient Educational Binder
    - Knowing your BP numbers
    - Meal portions
    - Salt intake
    - Exercise
    - Stress management

**Monthly visits:**
- Assessments
  - BP measurements*
  - Pulse
  - Adverse events

**Between visits patients logged:**
- BP medication(s) • Weight
- BP cuff readings • Minutes exercised
- Pulse • Stressful events

**Educational intervention**
- Review of patient educational binder
- Review of patient log
- Review of medical problems or medication change(s)
ISHIB Patient CV Toolkit

Content
264 Patients Screened

Randomization ($N=54$)
- Intervention ($n=27$)
- Usual Care ($n=27$)

Three months ($N=43$)
- Intervention ($n=18$)
- Usual Care ($n=25$)

Six months ($N=37$)
- Intervention ($n=12$)
- Usual care ($n=25$)
Baseline Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Usual Care (N=27)</th>
<th>Intervention (N=27)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>11 (41%)</td>
<td>12 (44%)</td>
<td>1.00</td>
</tr>
<tr>
<td>Female</td>
<td>16 (59%)</td>
<td>15 (56%)</td>
<td></td>
</tr>
<tr>
<td>Age, median [25(^{th}), 75(^{th})]</td>
<td>59 [55, 66]</td>
<td>58.5 [53, 63]</td>
<td>0.90</td>
</tr>
<tr>
<td>Timing of HTN diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-2 years ago</td>
<td>7 (26%)</td>
<td>3 (11%)</td>
<td>0.23</td>
</tr>
<tr>
<td>3-10 years ago</td>
<td>12 (44%)</td>
<td>11 (41%)</td>
<td></td>
</tr>
<tr>
<td>11+ years ago</td>
<td>8 (30%)</td>
<td>13 (48%)</td>
<td></td>
</tr>
<tr>
<td>Diabetes diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>6 (22%)</td>
<td>5 (19%)</td>
<td>1.00</td>
</tr>
<tr>
<td>No</td>
<td>21 (78%)</td>
<td>22 (82%)</td>
<td></td>
</tr>
</tbody>
</table>
Baseline Characteristics (cont.)

<table>
<thead>
<tr>
<th></th>
<th>Usual Care (N=27)</th>
<th>Intervention (N=27)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal (19-24 kg/m²)</td>
<td>8 (30%)</td>
<td>2 (7%)</td>
<td>0.051</td>
</tr>
<tr>
<td>Overweight (25-29 kg/m²)</td>
<td>9 (33%)</td>
<td>7 (26%)</td>
<td></td>
</tr>
<tr>
<td>Obese (30-40 kg/m²)</td>
<td>10 (37%)</td>
<td>18 (67%)</td>
<td></td>
</tr>
<tr>
<td><strong>Cigarette smoking</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11 (41%)</td>
<td>7 (26%)</td>
<td>0.39</td>
</tr>
<tr>
<td>No</td>
<td>16 (59%)</td>
<td>20 (74%)</td>
<td></td>
</tr>
<tr>
<td><strong>Alcohol Consumption</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>16 (59%)</td>
<td>0 (0%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Occasional</td>
<td>2 (7%)</td>
<td>17 (63%)</td>
<td></td>
</tr>
<tr>
<td>More than 2-3 drinks per day</td>
<td>9 (33%)</td>
<td>10 (37%)</td>
<td></td>
</tr>
<tr>
<td><strong>Illicit Drugs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9 (33%)</td>
<td>5 (19%)</td>
<td>0.35</td>
</tr>
<tr>
<td>No</td>
<td>18 (67%)</td>
<td>22 (82%)</td>
<td></td>
</tr>
</tbody>
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Mean Systolic and Diastolic Blood Pressure Over Follow-Up

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<thead>
<tr>
<th>Blood Pressure, mean (SD) mm Hg</th>
<th>Usual Care</th>
<th>Intervention</th>
<th>P-value (comparison of groups)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline</strong></td>
<td>N=27</td>
<td>N=27</td>
<td></td>
</tr>
<tr>
<td>SBP 135 (19)</td>
<td>143 (18)</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>DBP 85 (12)</td>
<td>90 (12)</td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td><strong>One month</strong></td>
<td>N=25</td>
<td>N=18</td>
<td></td>
</tr>
<tr>
<td>SBP 130 (22)</td>
<td>129 (16)</td>
<td>0.90</td>
<td></td>
</tr>
<tr>
<td>DBP 80 (11)</td>
<td>82 (8)</td>
<td>0.38</td>
<td></td>
</tr>
<tr>
<td><strong>Three months</strong></td>
<td>N=25</td>
<td>N=18</td>
<td></td>
</tr>
<tr>
<td>SBP 129 (15)</td>
<td>129 (18)</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>DBP 82 (12)</td>
<td>83 (7)</td>
<td>0.70</td>
<td></td>
</tr>
<tr>
<td><strong>Six months</strong></td>
<td>N=25</td>
<td>N=12</td>
<td></td>
</tr>
<tr>
<td>SBP 131 (18)</td>
<td>120 (14)</td>
<td>0.035*</td>
<td></td>
</tr>
<tr>
<td>DBP 81 (9)</td>
<td>77 (6)</td>
<td>0.092</td>
<td></td>
</tr>
</tbody>
</table>
Six-Month Goal Achievements

- Achieved ISHIB goal BP of <135/<85 mm Hg
  - Intervention vs. usual care:
    83% (10/12) vs. 60% (15/25), \( P=0.263 \)
- Patients with diabetes who achieved ISHIB goal BP of <130/80 mm Hg
  - Intervention vs. usual care:
    75% (3/4) vs. 50% (3/6), \( P=0.571 \)
Summary of Findings

- Educational intervention using the ISHIB IMPACT Cardiovascular Reduction toolkit
  - Greater BP reductions demonstrated in African American patients with uncontrolled HTN
  - Reports of improved diet and salt intake, exercise/walking, weight loss, and stress management
- Feasible, practical, and low-cost strategy for reducing racial disparities in HTN control
Patient Insights Summary

- Set one goal at a time; do not overwhelm the patient with a list of lifestyle changes that are not relevant or that are not realistic to the patient's lifestyle.
- Ease into patient education; focus on the top key points during first visit and continue to build on the patient education during follow-up visits.
- Factor in the patient's lifestyle prior to determining the course of disease management.
- The patient is a “whole person” and not just their disease. Make sure to address barriers to care and provide referrals and support for those barriers.
- Take time to get to know the patients to build a rapport and gain trust for better patient disclosure to identify “true barriers to care.”
Study Limitations and Next Steps

• Blinding not possible
• Over half of intervention patients did not complete follow-up
  – Prevalence of alcohol was greater in this group
  – Study halted for administrative reasons
  – Sample size sufficient to establish proof of concept
• Next step: validate findings in a larger scale, long-term, randomized controlled trial
CV Toolkit Materials to Digital Application

- Transitioning ISHIB tools to a cost effective, repeatable, reproducible, scalable, and measurable platform

CV Toolkit

CV Toolkit App

Official Launch at 2014 ISHIB National Convention
Thank You