Managing Hypertension and Obesity through Therapeutics and Lifestyle Modifications

December 4, 2013
Baltimore, Maryland

Educational Partner:
The American Society for Preventive Cardiology
Session 2: Managing Hypertension and Obesity Through Therapeutics and Lifestyle Modifications

Learning Objectives:
1. Outline current guidelines on the diagnosis, management, and treatment of patients who are obese.
2. Identify the constellation of cardiovascular risk markers in diabetic, insulin-resistant, metabolic syndrome and/or obese patients.
3. Understand the comprehensive approach to the treatment of obesity and hypertension.

Faculty

James A. Underberg, MD, MS, FACPM, FACP, FASH, FNLA
Diplomate, American Board of Clinical Lipidology
Clinical Assistant Professor of Medicine
New York University (NYU) Medical School
NYU Center for Cardiovascular Disease Prevention
Director Bellevue Hospital Lipid Clinic
New York, New York

Dr Underberg is a clinical assistant professor of medicine in the division of general internal medicine at New York University (NYU) Medical School and the NYU Center for Cardiovascular Disease Prevention. He is the director of the Bellevue Hospital Primary Care Lipid Management Clinic and is also a member of the executive committee of the division of general internal medicine. His clinical focus is preventive cardiovascular medicine. He is an American Society of Hypertension (ASH)-certified specialist in clinical hypertension and a diplomate of the American Board of Clinical Lipidology. Dr Underberg is the founder and president of the New York Preventive Cardiovascular Society and a founding member of the board of directors of the Northeast Chapter of the National Lipid Association (NLA). He serves on the editorial board of the Journal of Clinical Lipidology, co-chairs the communication committee of the NLA, and is the co-editor of the NLA quarterly newsletter Lipid Spin. He currently serves on the CME committee of the ASH. He graduated from Yale University with a BS and MS and from the University of Pennsylvania Medical School. His internship and residency were completed at NYU-Bellevue Hospital Medical Center. He has been elected a fellow of the American College of Preventive Medicine, the Society of Vascular Medicine, the NLA, the American College of Physicians, and the ASH. He is currently involved in several clinical trials in the areas of hypertension, lipids, diabetes, and cardiovascular disease prevention. He sees patients both in a university-based referral practice and in the Bellevue Hospital Lipid Clinic.

Robert K. Gleeson, MD, FACP, FNLA
Diplomate, American Board of Clinical Lipidology
Assistant Professor, Medicine
Froedtert and The Medical College of Wisconsin
Milwaukee, Wisconsin

Dr Gleeson is an assistant professor in the department of general medicine at the Medical College of Wisconsin. He is director of the preventive cardiology and lipid management program, which is part of the college’s Heart and Vascular Center, and director of the executive physical program, which is part of the college’s Clinical Ventures Group.

His professional interests are promoting a heart-healthy lifestyle and the use of easily understood lipid treatment protocols to improve compliance.

**Faculty Financial Disclosure Statements**

The presenting faculty reports the following:


Dr Gleeson has no financial relationships to disclose.

**Education Partner Financial Disclosure Statement**

The content collaborators at the American Society for Preventive Cardiology have no financial relationships to disclose.

**Suggested Reading List**


Managing Hypertension and Obesity through Therapeutics and Lifestyle Modifications

SPEAKERS
James A. Underberg, MD, MS, FACPM, FACP, FASH, FNLA
Robert K. Gleeson, MD, FACP, FNLA

SESSION 2
9:15–10:45am

New Strategies for Obesity Management & Cardiometabolic Risk Reduction: Proven Strategies in Different Patient Populations

James A. Underberg, MD, MS, FACPM, FACP, FASH, FNLA
Clinical Assistant Professor, NYU School of Medicine
NYU Center for Cardiovascular Disease Prevention
Director, Bellevue Hospital Lipid Clinic, New York, NY

Cardiometabolic Risk
- Gives a comprehensive picture of a patient's health and potential risk for future disease and complications
- Is inclusive of all risks related to metabolic changes associated with CVD
- Accommodates emerging risk factors as useful predictive tools
- Refocuses clinical attention to the value of systematic evaluation, education, disease prevention and treatment
- Supports an integrated approach to care


Abnormal Lipid Metabolism
- LDL ↑
- ApoB ↑
- HDL ↓
- Trigly. ↑

Age-Adjusted Relative Risk

Body Mass index (kg/m²)

Men

Women

Relationship Between BMI and Risk of Type 2 Diabetes

NHANES – Prevalence of Obesity 1961-2010

NCEP Metabolic Syndrome Definition
(Any three of the five criteria)

- Blood pressure ≥130 / ≥85 mmHg
- Fasting plasma glucose ≥110 mg/dL
- Triglycerides ≥150 mg/dL
- Waist circumference Women >35”
- Men >40”
- HDL-C Women <50 mg/dL
- Men <40 mg/dL


Components of the Metabolic Syndrome and Incidence of CHD Events


Metabolic Syndrome as a Predictor of CHD and Diabetes in WOSCOPS


Cardiometabolic Risk Factors

Non-modifiable
- Age
- Race/ethnicity
- Gender
- Family history

Modifiable
- Overweight/obesity
- Smoking
- Physical inactivity
- Abnormal lipid metabolism
- Hypertension
- Insulin resistance
- Inflammation

Components of the Metabolic Syndrome


NIH Obesity clinical guidelines- Key Points

(1) A low-calorie diet (LCD; 800–1,200 kcal/day) can reduce total body weight by an average of 8% over 6 months and can help reduce abdominal fat.

(2) A very-low-calorie diet (VLCD; 250–800 kcal/day) produces greater initial weight loss than a LCD, but long-term weight loss at > 1 year is similar with both diets.

(3) Aerobic exercises result in modest weight loss and may reduce abdominal fat in overweight and obese adults. It may also improve cardiopulmonary fitness.

(4) Reduced calorie intake and increased physical activity, when used in combination, produce greater weight loss than the use of either modality alone.

(5) When behavior therapy is used in combination with other weight loss approaches, it provides additional short-term benefits.

Key Elements Of Lifestyle Change

Increased Activity

Dietary Changes

Benefits of the Mediterranean Diet?

- **Weight loss:**
  - Meta analysis of 16 RCT’s with 3,436 patients comparing diet for weight loss demonstrated a significant effect on weight (1-7.5%) and BMI (0-0.2 kg/m²), with greater reductions in the setting of energy restriction and increased physical activity.

- **CHD risk:**
  - One systematic review of cohort and 43 RCT’s found a RR of 0.34 for CHD and strong causality association between Mediterranean Diet “pattern” (fruits, vegetables, legumes, nuts, whole grains, MUFA>SFA) and improved CHD risk among 140 cohort studies.

- **Dementia/Alzheimer’s Disease:**
  - Prospective study of 1,180 elderly NYC population followed for 5 years found that higher adherence to Mediterranean diet was independently associated with a lower HR of 0.80 for Alzheimer’s equal to physical activity (HRR, 0.87).

NIH Obesity clinical guidelines- Key Points

(6) Pharmacological therapy for obesity should only be used as part of a comprehensive weight loss program (including diet and physical activity) for patients with a BMI of >30 with no concomitant obesity-related risk factors, or for patients with a BMI of >27 with concomitant obesity-related risk factors or diseases.

(7) Bariatric surgery is an option for severely obese patients (BMI > 40 or > 35 with comorbidity conditions) who are at high risk of obesity-related morbidity and who have failed a trial of less invasive interventions.

(8) The initial goal of weight loss therapy should be to reduce body weight by approximately 10% from baseline weight.

(9) Target weight loss should be approximately 1–2 pounds/week for a period of 6 months.

(10) Initially, moderate levels of physical activity for 30–45 min at least 3–5 days per week should be encouraged.

Dietary Considerations

- **Calorie level**
- **Macronutrient content**
- **Meal replacement products**

Diet and Reinfarction Trial: Methods

- Randomized, controlled, prospective
- Factorial design
- 2,033 men, <70 yo
- Allocated to receive (or not) advice to
  - decrease fat intake to <30% energy,
  - increase intake of fatty fish (200-400 g/wk), or
  - increase intake of dietary fiber to 18 g/d
- Followed for all-cause mortality for 2 yr
**Primary Prevention of Cardiovascular (CV) Disease with a Mediterranean Diet**

Outcomes According to Study Group

<table>
<thead>
<tr>
<th>Primary Endpoint</th>
<th>Mediterranean Diet, EVOO vs Control</th>
<th>Mediterranean Diet, Nuts vs Control</th>
<th>Hazard Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary endpoint</td>
<td>0.70 (0.53, 0.91)</td>
<td>0.70 (0.53, 0.91)</td>
<td>0.70 (95% CI)</td>
</tr>
<tr>
<td>Multivariate-adjusted 1</td>
<td>0.74 (0.59, 0.91)</td>
<td>0.74 (0.59, 0.91)</td>
<td>0.74 (95% CI)</td>
</tr>
<tr>
<td>Multivariate-adjusted 2</td>
<td>0.74 (0.59, 0.91)</td>
<td>0.74 (0.59, 0.91)</td>
<td>0.74 (95% CI)</td>
</tr>
<tr>
<td>Secondary Endpoint</td>
<td>0.70 (0.53, 0.91)</td>
<td>0.70 (0.53, 0.91)</td>
<td>0.70 (95% CI)</td>
</tr>
<tr>
<td>Stroke</td>
<td>0.64 (0.44, 0.93)</td>
<td>0.64 (0.44, 0.93)</td>
<td>0.64 (95% CI)</td>
</tr>
<tr>
<td>Myocardial Infarction</td>
<td>0.79 (0.44, 1.32)</td>
<td>0.79 (0.44, 1.32)</td>
<td>0.79 (95% CI)</td>
</tr>
<tr>
<td>CV Mortality</td>
<td>0.65 (0.46, 0.94)</td>
<td>0.65 (0.46, 0.94)</td>
<td>0.65 (95% CI)</td>
</tr>
<tr>
<td>All-cause Mortality</td>
<td>0.71 (0.62, 0.83)</td>
<td>0.71 (0.62, 0.83)</td>
<td>0.71 (95% CI)</td>
</tr>
</tbody>
</table>

Trial stopped early (median f/u 4.8 years) due to interim analysis showing benefit for primary endpoint with Med Diet


**Incidence of Outcome Events in the Total Study Population**

Primary Endpoint

<table>
<thead>
<tr>
<th>Year</th>
<th>Control Diet</th>
<th>Mediterranean Diet, EVOO</th>
<th>Mediterranean Diet, Nuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>2004</td>
<td>2004</td>
<td>2004</td>
</tr>
</tbody>
</table>

*Myocardial infarction, stroke, or death from cardiovascular causes


**Anti Obesity Medications**

Currently FDA approved

- Orlistat
- Lorcaserin
- Phentermine/Topiramate

Currently available as of 2013

Withdrawn from US Market

Drugs@FDA. http://www.accessdata.fda.gov/drugs
Orlistat

• Brand name: Xenical
• Prescription orlistat 120 mg TID approved for long-term weight management in 1999; OTC orlistat (60 mg TID) approved in 2007
• Mechanism: Gastrointestinal lipase inhibitor; decreases intestinal energy absorption
• Most common AEs: Oily rectal discharge, fecal urgency, fatty/oily stool
• Rare postmarketing reports of severe liver injury

Notes

• May decrease cyclosporine and levothyroxine levels
• May decrease fat-soluble vitamin absorption; users should take daily multivitamin containing vitamins A, D, E, K, beta carotene
• May enhance warfarin effect if vitamin K absorption is diminished

Pregnancy category X

Phentermine

• Phentermine resin (15-30 mg/d) approved in 1959 for short-term (12 wk) weight management
• Phentermine HCl developed in 1970s with doses of 8-37.5 mg (generally equivalent to 6.4-30 mg of phentermine resin)
• Mechanism: Noradrenergic, sympathomimetic amine–decreases appetite
• Most common AEs: Tachycardia, increase in BP, tremor, overstimulation of CNS, dry mouth, constipation

Notes

• Generic; most commonly prescribed/least expensive option
• Phentermine HCl salt easily dissociates in GI tract, resulting in immediate-release of phentermine drug; absorbed ~3× faster than resin
• DEA Schedule IV drug
• Pregnancy category X

Lorcaserin

• Brand name: Belviq
• Approved in 2012 (10 mg BID) for long-term weight management
• Mechanism: Selective 5-HT2C receptor agonist–increases satiety
• Most common AEs: Headache, nausea, dizziness, fatigue, dry mouth, constipation

Notes

• Discontinue if 5% weight loss is not achieved by week 12
• Discontinue for evaluation if signs or symptoms of valvular heart disease

Pregnancy category X


BLOOM Study

Body Weight Over Years 1 and 2

BLOOM-DM

Change in Glycemic Parameters

*P < 0.05; †P < 0.01, least square mean change ± standard error of the mean.

HbA1C = glycosylated hemoglobin

**Phentermine/Topiramate**

- **Brand name:** Qsymia
- **IR phentermine HCl/CR topiramate approved for weight management in 2012 (titrated in AM up to 7.5/23 mg/day; max 15/58 mg/day)**
- **Mechanism:** Phentermine—decreases short-term appetite. Topiramate—decreases longer-term appetite and may have glycemic effects
- **Most common AEs:** Paresthesia, dizziness, cognitive dysfunction, dysgeusia

**Notes**

- Discontinue if 5% weight loss is not achieved after 12 weeks on full (maximum) daily dose
- Pregnancy category X (dMTA pake)

**Controlled-Release Phentermine/Topiramate 7.5 mg/44 mg**

- **Mechanism:** Phentermine 15 mg/topiramate 82 mg (titrated in AM up to 7.5/46 mg/d; max 15/92 mg/d)

- **Schedule IV drug**
- **If full/max dose discontinued, it should be done gradually to prevent seizures**
- **May contribute to secondary angle-closure glaucoma**
- **Discontinue if 5% weight loss is not achieved after 12 weeks on full (maximum) daily dose**
- **Blood pressure ≤140/90 mmHg using 0-2 antihypertensive medications**
- **Fasting blood glucose ≤110 mg/dL**
- **Triglycerides ≤200 mg/dL using 0 or 1 lipid lowering medications**
- **SBP 140-160 mmHg and/or DBP 90-100 mmHg or taking ≥2 meds for HTN**
- **Triglyceride level between 200-400 mg/dL or taking ≥2 meds for dyslipidemia**
- **Fasting blood glucose >100 mg/dL and (or) ≥140 mg/dL 2 hours post 75 gm glucose load (OGTT) and/or diagnosis of type 2 diabetes**
- **Wald circumference ≥102 cm (40 in) for men or ≥88 cm (35 in) for women**

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**EQUIP & CONQUER:**

**Study Entry Criteria**

<table>
<thead>
<tr>
<th>EQUIP</th>
<th>CONQUER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>One year</strong></td>
<td><strong>One year</strong></td>
</tr>
<tr>
<td><strong>Adults ≤70 years of age</strong></td>
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</tr>
<tr>
<td><strong>BMI ≥27 and ≤45 kg/m²</strong></td>
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</tr>
<tr>
<td><strong>Blood pressure ≤140/90 mmHg using 0-2 antihypertensive medications</strong></td>
<td><strong>(no lower BMI limit in T2DM)</strong></td>
</tr>
<tr>
<td><strong>Fasting blood glucose ≤110 mg/dL</strong></td>
<td><strong>Have two or more of the following obesity-related co-morbid conditions:</strong></td>
</tr>
<tr>
<td><strong>Triglycerides ≤200 mg/dL using 0 or 1 lipid lowering medications</strong></td>
<td><strong>SBP 140-160 mmHg and/or DBP 90-100 mmHg or taking ≥2 meds for HTN</strong></td>
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**EQUIP & CONQUER:**

**Weight Loss Over Time**

- **Proposed brand name: Contrave**
- **Investigational agent undergoing CV outcomes trial (Light Study)**
- **Mechanism: Naltrexone-opioid antagonist for treatment of alcohol dependence and blockade of effects of exogenous opioids; may reduce appetite and addictive behavior; bupropion-antidepressant of the aminoketone class chemically unrelated to tricyclic, tetracyclic, SSRI, or other antidepressant agents that may reduce appetite**
- **Most common AEs: Nausea, constipation, dizziness, dry mouth, tremor, upper abdominal pain, tinnitus**

**Notes**

- **Light Study enrolling obese patients (N =10,000) with estimated background rate of 1.0%-1.5% annual risk of major CV event with upper bound of 95% CI excluding hazard ratio of 2.0 at interim analysis (87 events, 1.4 at final analysis)**
- **The combination agent dosing being studied include naltrexone SR 32 mg/d combined with bupropion SR 360 mg/d**

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**Liraglutide for Weight Loss in Patients With Type 2 Diabetes**

- **Brand name:** TBD
- **GLP-1 analog approved for type 2 diabetes mellitus**
- **Mechanism:** Anorectic effect possibly mediated by activation of GLP-1 receptor expressed on vagal afferents and by GLP-1 receptor activation in CNS, which may affect visceral fat adiposity, appetite, food preference, and CV biomarkers in patients with type 2 diabetes
- **Most common AEs:** Dose-dependent nausea, vomiting, diarrhea
- **Not approved as a stand-alone weight management agent**

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**Study Entry Criteria**

- **BMI ≥27 and ≤45 kg/m²**
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**Placebo + BMOD, n = 301**

**Naltrexone/Bupropion**

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**References:**

- Mountain HE; Expert View, 2012.
Effect of Obesity Drugs on Lipids
Average Changes from Baseline

<table>
<thead>
<tr>
<th></th>
<th>Total Cholesterol</th>
<th>LDL-C</th>
<th>Triglycerides</th>
<th>HDL-C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orlistat</td>
<td>↓ 2%</td>
<td>↓ 4%</td>
<td>↑ 1%</td>
<td>↑ 9%</td>
</tr>
<tr>
<td>Lorcaserin</td>
<td>↓ 1%</td>
<td>↑ 2%</td>
<td>↓ 5%</td>
<td>↑ 2%</td>
</tr>
<tr>
<td>Phentermine/Topiramate</td>
<td>↓ 6%</td>
<td>↓ 8%</td>
<td>↓ 5%</td>
<td>↑ 4%</td>
</tr>
</tbody>
</table>

Summary
- Obesity/Overweight continues to be a problem worldwide associated with Cardiometabolic Risk
- Therapeutic interventions include lifestyle, bariatric surgery and pharmacologic therapies
- Weight loss vs. Preventing Weight Gain may be important issues
- Dietary Interventions can cause short term weight loss, and some long term CV benefits
- Pharmacologic intervention for weight loss should be used with an understanding of potential cardiometabolic benefits.

Hypertension and Obesity
Still Waters Run Deep
Robert Gleeson, MD, FACP, FNLA
Medical College of Wisconsin
Preventive Cardiology and Lipid Management

Does Preventive Cardiology Make a Difference?

Why does preventive cardiology matter?
1. Since 1960, has worked to identify the major causes of atherosclerosis and CAD
2. Identified treatments that lowered the risk factor and CAD
3. Wrote guidelines for best treatment

But cardiovascular disease remains the leading cause of premature morbidity and mortality
The American Society for Preventive Cardiology is proud to continue the fight to prevent cardiovascular disease.
Please join us in our journey.
Together we can work to prevent atherosclerosis.
aspconline.org
Key Points about Obesity

1. Obesity increases risk of all CVD risk factors, events, and mortality
2. Obesity increases hypertension, which is largely untreated
3. Treating hypertension in the obese patient lowers risk of CVD events
4. Treating obesity lowers hypertension and improves other CV risk factors

Measuring BP in the Obese

- A standard BP cuff over-estimates BP in obese
- For every 5 cm increase in arm circumference, the BP increases 3/2 mm
- Standard cuff fits 9 to 13 inches circumference
- Large cuff fits 13 to 17 inches circumference

Regardless of etiology, hypertension increases

- CV deaths
- Coronary artery disease
- Stroke
- Peripheral artery disease
- Heart failure
- Valvular heart disease

Hypertension and CVD

- BP has a continuous, graded, and linear effect on CVD with a nadir of 115/75
- Above that, CVD events and mortality double for every
  - 20 mm increase in systolic
  - 10 mm increase in diastolic
- 66% of CHD deaths occur in men with systolic BP between 130 and 159

Obesity and Hypertension

- 75% of hypertension is related to obesity¹

<table>
<thead>
<tr>
<th>BMI</th>
<th>Prevalence of HBP % NHANES 2005 to 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 25</td>
<td>15.3</td>
</tr>
<tr>
<td>25-30</td>
<td>27.8</td>
</tr>
<tr>
<td>&gt; 30</td>
<td>42.5</td>
</tr>
</tbody>
</table>

Hypertension in obesity

- Only 30% of hypertension in obese is treated adequately

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¹ Krus et al. Circ 1998

² Kurukulasuriya UT et al. Med Clin North Am 2011 Sep;95(5):903-17
Obesity and CVD

1. Obesity is the leading public health crisis of our time
   • The obesity pandemic may be flattening century + gain in life
2. Obesity is epidemic in children and adolescents
   • CVD disease burden likely increases with duration of obesity

Obesity increases CVD by increasing

• Hypertension
• Atherogenic dyslipidemia
• Insulin resistance and diabetes
• Inflammation
• Thrombosis
• Endothelial dysfunction
• Sleep apnea

Obesity increases hypertension

• Multiple inter-related causative factors
  • Activation of the RAAS, SNS, insulin resistance, leptin, adiponectin, dysfunctional fat, FFA, resistin, 11 Beta dehydrogenase, renal structural and hemodynamic changes, and OSA
  • Obesity has a central role in development of CVD and risk is linear with weight gain

Metabolic Syndrome increases CVD risk more than the sum of its parts

<table>
<thead>
<tr>
<th>Condition</th>
<th>Relative risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular mortality</td>
<td>2.40</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>2.35</td>
</tr>
<tr>
<td>MI</td>
<td>1.99</td>
</tr>
<tr>
<td>Stroke</td>
<td>227</td>
</tr>
</tbody>
</table>

Mottillo S et al, J Am Coll Cardiol. 2010 Sep 28;56(14):1113-32

Is overweight with normal risk factors still a risk?

- Yes.
  - They still had impaired vaso-reactivity, increased LV mass, impaired clotting
- No
  - 22,000 hypertensive patients with CHD

<table>
<thead>
<tr>
<th>BMI</th>
<th>HR</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-25</td>
<td>1.0</td>
</tr>
<tr>
<td>25-30</td>
<td>0.77</td>
</tr>
<tr>
<td>30-35</td>
<td>0.68</td>
</tr>
</tbody>
</table>

1. Lind ATVB 2011;31
2. Uretsky Obesity Paradox Ann J Med 2007;120

Overweight versus waist measurement

- At every BMI and in both men and women, the risk of cardiovascular disease is increased by increasing abdominal fat
- WHR is better predictor of CVD than BMI

Waist measurement

- Increased risk for HBP, diabetes, dyslipidemia if
  - Caucasian and Blacks M > 40 F > 35
  - S. Asian and Japanese M > 35 F > 31
- Most useful if BMI 25 to 35
- If BMI > 35, waist measurement adds little predictive value

Waist to hip ratio WHR from Nurses Health Study

- Normal
  - Men: WHR < 0.9
  - Women: < 0.8
- A larger WHR is always worse
- Females:
  - WHR > 0.88 compared to WHR < 0.72 has HR of CHD = 3.2
  - Even if BMI normal (20 to 25), a WHR > 0.76 compared to WHR < 0.76 has a HR of CHD = 2

Treating obesity to lower blood pressure

1. Lose weight
2. Lose weight and exercise more
3. Treat BP and CV risk factors
4. Lose weight, exercise more, and treat the BP
5. Major social campaigns like the no smoking campaigns
6. All of the above

Weight-loss and BP mixed results

- Weight-loss diets lower BP best
  - Diet weight loss of 4 kg lowers BP 6/3 mm Hg
  - Some weight-loss meds lower BP, some raise
  - Orlistat lowers BP but not as much as diet
  - Sibutramine no effect
  - Roux-en-Y gastric bypass lowers BP, but not as much as anticipated
  - Liposuction no effect on BP

Horvath Arch Med 2008 commentary
Benefits of Weight Loss

• 5% weight loss is associated with reduction of
  • angiotensinogen levels by 27%
  • renin by 43%
  • aldosterone by 31%
  • angiotensin-converting enzyme activity by 12%
  • angiotensinogen expression by 20% in adipose tissue


Weight loss options

• Commercial weight-loss programs
  • Work quite well, may be sustainable
  • Diet and exercise
    • Necessary to do both, but sustaining is hard
  • Pharmaceuticals
    • All short-term and with side effects
  • Surgery, esp. bariatric surgery
    • Long-term benefit, but need compliant patient

National Weight Control Registry predictors of successful long-term weight control

1. Self-monitoring of weight
2. Consumption of a low-fat diet
   • Different macronutrient components of diet are less important than over-all calorie restriction
3. Daily physical activity of approximately 60 minutes
4. Minimal sedentary “screen time”
5. Eating most meals at home

National Weight Control Registry

Major difficulty of weight loss

• “Body weight and body fat are tenaciously regulated.” emedicine on obesity options
• When patients lose weight by dieting, their total and resting energy expenditure also drop in an effort to conserve energy.
• The only way to counteract this drop is to increase activity levels

Anti-hypertensives in the obese

It’s the lower BP, not the drugs that matter
Treat high-risk obese when BP > 130/80

Landsberg et al J Clin Hypertens Jan 213
Anti-hypertensives in the obese

Most of the anti-hypertensive benefit comes from the lowest dose of the drug

Treating hypertension in obese according to Jan 2013 statement of ASH and Obesity Society

• Target < 140/90 unless DM, CKD and then aim for < 130/80
• RAAS inhibition
  • ACE or ARB
  • CCB
• Diuretics
  • Low-dose thiazide or thiazide like agents
  • Loop diuretics if required
  • Potassium sparing agents
• Avoid beta-blockers except for specific cardiac indication
• All agents are potentiated by weight loss

Treating hypertension in obese patients cont’d

• Beta-blockers and thiazides both increase insulin resistance and diabetes
• Thiazide diuretics increase dyslipidemia associated with obesity
  • If use thiazides, use low dose like 12.5 to 25 mg of HCTZ or chlorthalidone
• Beta blockers cause insulin resistance and weight gain
  • Limit beta blockers to post MI or HF

Summary

1. Obesity increases risk of hypertension
2. The combination substantially increases the risk of CVD
3. Treating hypertension in the obese requires treating the obesity as part of the therapeutic plan
  1. Lifestyle management is required for every case
4. Lower HBP in the obese is essential to reduce risk of CVD

Question & Answer