Hypertension Case Study

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Introduction

- JB 46yo, AAM, c/o SOB when walking up stairs or distances
- PMH: NIDDM
- SH: 15 pack/year smoker, family hx HTN, NIDDM, CVA, MI
- Meds: glypizide

Physical Exam

- BP 146/101
- ocular fundus with arteriolar narrowing
- S3 gallop
- LVH with 40% EF
- elevated lipid profile
- BMI 34

Hypertension

- SBP 140 mm Hg or greater
- DBP 90 mm Hg or greater
- taking antihypertensive medication
  - JNC VI

Measuring Blood Pressure

- seated, arms supported at heart level, bare
- no smoking or caffeine for 30' prior
- bladder should encircle 80% of arm, use mercury sphygmomanometer
- rapidly inflate 30mm Hg above disappearance of radial pulse

Measuring Blood Pressure

- release at a rate of 2-3 mm Hg/second
- SBP - first appearance of sound (phase 1)
- DBP - disappearance of sound (phase 5)
- average 2 readings 2 minutes apart
  - Hawkins (1997)

Blood Pressure Classification - JNC VI

HTN	Systolic	Diastolic
Stage 1	140-159	90-99
Stage 2	160-179	100-109
Stage 3	>180	>110

Blood Pressure Classification

- Stage 2

Blood Pressure Classification

- Target Organ Damage(TOD)
- ocular arteriolar narrowing
- S3 gallop
- LVH, 40% EF

Pathophysiology

- Sodium - greater salt sensitivity of AA
- Calcium - regulation in vascular smooth muscle altered in AA
- Stress - exaggerated BP response to stress in AA
- Hemodynamics - greater sensitivity and volume dependence in AA at all pressures
  - (Scott 1997)

Risk Stratification

BP	Group A	Group B	Group C
High Normal	Lifestyle	Lifestyle	Drug Therapy
Stage 1	LS(12 mos)	LS(6 mos)	Drug Therapy
Stage 2, 3	Drug Therapy	Drug Therapy	Drug Therapy

Risk Stratification

- Risk Factors
  - smoking, dyslipidemia, diabetes, family history, male, weight
- Target Organ Damage
  - left ventricular hypertrophy
  - S3 gallop
- Risk Group C - Drug Therapy

Risk Stratification

- higher prevalence of hypertension - 32.4% vs. 23.3%
- higher incidence of cardiovascular disease risk factors
- greater evidence of target organ damage

Therapeutic Goals

- BP 130/85 or less
- lifestyle modification
- hyperlipidemic control

Therapeutic Alternatives

- lifestyle modifications
  - reduce CV risk factors
  - effective in reducing BP
  - effective in reducing number and dosage of medications

Therapeutic Alternatives

- medications
  - appropriate in patients with multiple risk factors
  - target organ damage - medications can help to reduce

Pharmacologic Alternatives

- second line
  - diuretics - good drug for AA however increase insulin resistance and glucose intolerance
  - Beta Blockers - mask hypoglycemia secondary to sympathetic blockade, not as effective in AA

Pharmacologic Alternatives

- first line
  - ACE I - Class 1 evidence for DM, help reversal of LVH, fewer effects on glucose homeostasis
    - (Saunders, 1990; Brownley, 1999)

Therapeutic Plan

- fosinopril - 10mg
  - once daily, start at higher dose, can increase quickly to 20mg/day, maximum dose 80 mg

Therapeutic Plan

- lifestyle modification
  - stop smoking
  - weight loss
  - exercise
  - diet counseling
  - decrease caffeine use
  - relaxation

Monitoring Parameters

- blood
  - renal panel
  - fasting lipid profile
- urine
- side effects
  - cough, nausea, headache
- EKG

Medication Counseling

- fosinopril
  - take medication
  - cough - 3-10%
  - hyperkalemia - diet counseling for high potassium foods
  - medication interactions - lithiumtoxicity, antacids
  - neutropenia, agranulocytosis - <1%
  - angioedema, hypersensitivity, usually 1st dose

Additional Medication Options

- diltiazem - add as second agent AFTER fosinopril maxed
  - start at 120 mg, can increase to 360 mg/day as single dose
  - fewer effects on diabetes, RCT show as effective as diuretics for AA, less reduction of heart rate than others, greater exercise tolerance
    - once daily dosing
      - (Hall 1998; Brownley 1999)

Medication Counseling

- diltiazem
  - take medication
  - dizziness, flushing, constipation, headache
  - medication interactions - cimetidine, tegretol, CYP450 medication interactions, grapefruit juice

References

- Brownley, K.A. Hurwitz, B.E., & Schneiderman, N. (August, 1999). Ethnic variations in the pharmacological and nonpharmacological treatment of hypertension: biopsychosocial perspective. Human Biology, 71(4), 607-639.

References

- Clark, L.T. (August 23, 1999). Primary prevention of cardiovascular disease in high-risk patients: physiologic and demographic risk factor differences between african american and white american populations. The American Journal of Medicine, 107(2A), 22S-24S.

References

- Hall, W.D. Reed, J.W. Flack, J.M. Yunis, C Preisser, J & the ISHIB Investigators Group. (October 12, 1998). Comparison of the efficacy of dihydropyridine calcium channel blockers in african american patients with hypertension. Archives of Internal Medicine, 158(18), 2029-2034.

References

- Hawkins, D.W. Bussey, H.I. & Prisant, L.M. (1997). Hypertension. In J.T. DePiro, (Ed.). Pharmocotherapy A Pathophysiologic Approach (pp.195-218). Stamford, CT: Appleton & Lange.

References

- Saunders, E. et al. (August 1990) A comparison of the efficacy and safety of a beta-blocker; a calcium channel clocker, and a converting enzyme inhibitor in hypertensive blacks. Archives of Internal Medicine, 150, 1707-1713.

References

- Scott, N.A. (1997). Hypertension in african americans. In N.A. Scott (Ed.). Cardiovascular disease in african-americans (pp. 1-14). Birmingham, MI: Physicans Press.

References

- Sica, D.A. (Ed.) (December 1999) Managing hypertension in the southeastern United States: Applying the guidelines from the sixth report of the joint national committee on prevention, detection, evaluation and treatment of high blood pressure(JNC VI). The American Journal Of The Medical Sciences, 318(6), 357-364.

References

- The sixth report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure. (November 24, 1997) Archives of Internal Medicine157, 2413-2444.
- Uphold, C.R, & Graham, M.V. (1998). Clinical Guidelines in Family Practice. Gainesville, FL: Barmarrae Books, Inc.

References

- Weir, M.R. Et.al. (May 1998). Influence of race and dietary salt on the antiphyertensive efficacy of an angiotensin-converting enzyme inhibitor or a calcium channel antagonist in salt-sensitive hypertensives. Hypertension 31(5), 1088-1096.
- Www.amhrt.org/risk/index.html