

HIV Primary Care: Managing Comorbidities in the HIV-Infected Adult

Hermeyone Wilson, APRN, BC, AACRN
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Objectives

- * Stage a patient's HIV infection.
- * Prescribe treatment and manage common comorbidities in HIV Primary Care.
- * Make appropriate referrals and consultations with patient and healthcare team.

Comorbidity

- * May be
 - * Medical or psychiatric
 - * Exacerbated by "primary disease"
- * May exacerbate "primary disease"
- * But, is not caused by "primary disease"
- * Treating primary disease will not treat the comorbidity (may exacerbate comorbidity)

Functional Definition of Comorbidity

- * Any condition not included in the CDC list of AIDS defining conditions.

Comorbidities in HIV

* Opportunistic Infections	* Malignancies
* Endocrine Disorders	* Neurocognitive Disorders
* Cardiovascular Disease	* Mental Health and Substance Abuse
* Renal Disease	* Dermatologic Conditions
* Liver Disease	* Sexually Transmitted Diseases

Baseline Evaluation of the HIV-Infected Adult

* Date of HIV Dx	* Medication Hx
* CD4 nadir	* Hospitalizations/Past Surgeries
* ARV Hx	* Allergies
* STD Hx	* Mental Health Hx
* OI Hx	* Social Hx
* Past Medical Hx	* Laboratory Analysis
* STD hx	* Diagnostic Testing
* Family Hx	

Case Study

- * A.S. 56 year old female, smoker
- * DX HIV 1993
- * Allergies: Lisinopril (rash), Truvada (acute renal failure)
- * Current Medications: Actos 30mg QD, Calcium 500 + Vitamin D3 QD, Coreg 12.5 mg BID, Effexor XR 150 mg 2 tabs QD, gemfibrozil 600 mg BID, Intelence 200 mg BID, ISENTRESS 400 mg BID, Lantus 10 units QHS, Lasix 20 mg QD, Lipitor 40 mg QD, Lyrica 300 mg BID, ProAir MDI 90 mcg 2 puffs q6 hours PRN, tramadol 50 mg QD, Vitamin D2 50,000 unit twice a week, zolpidem 10 mg QHS

Case Study: A.S. Baseline Labs

- * CD4/T-cell: 684/38.9%
- * HIV RNA: 44,100 copies
- * RT mutations: K70R, T69S, M184V,
- * HgB: 9.3 g/dL
- * Hct: 32.1%
- * Glucose: 86 mg/dL
- * BUN: 39.0 mg/dL
- * Creatinine: 1.8 mg
- * Total Cholesterol: 200 mg/dL
- * Triglycerides: 286.0 mg/dL
- * HDL: 28.9 mg/dL
- * LDL: 113.9 mg/dL
- * Urinalysis: Protein 300 mg/dL, Albumin 150 mg/dL, Creatinine 100 mg/dL, A:C ratio >300 mg/g HIGH

Case Study: A.S. Baseline Diagnostic Tests

- * DEXA Scan: T-score -3.8 (Hip), T-score - 3.2 (Spine)
- * Chest Xray: Mild Cardiomegaly, pulmonary edema
- * Height 5'3", weight 162 lbs., BMI 28.71
- * BP 160/91

Case Study

*What are A.S. comorbid conditions?

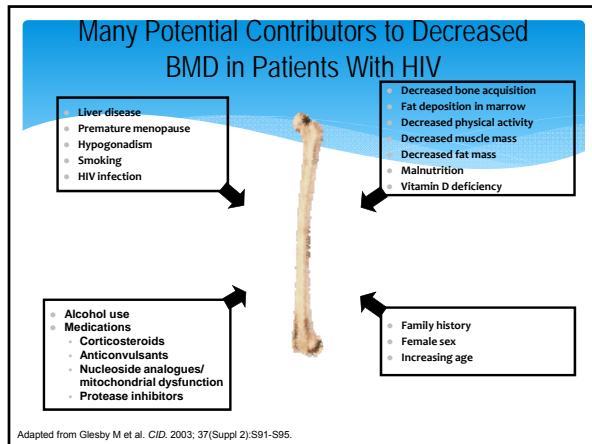
A.S. Comorbid Conditions

- * **Endocrine Disorders**
 - * Diabetes
- * **Bone Health Disorders**
 - * Osteoporosis
 - * Hip Placement
 - * Multiple fractures
- * **Cardiovascular Issues**
 - * Hypertension
 - * Hyperlipidemia
 - * Tobacco Abuse
- * **Renal Disorders**
 - * CKD, Stage 3
- * **Neurological Conditions**
 - * Neuropathy
- * **Psychiatric Conditions**
 - * Insomnia
 - * Depression

Risk Factors Associated with Comorbidities

- * The risk of having more comorbidities increases with age, smoking, duration of ART use, and the severity of previous immunodeficiency

Schouten, J. AIDS 2012; XXI International AIDS Conference



BMD in HIV+ Persons

- Multiple studies have found increased prevalence of osteoporosis and osteopenia in HIV-infected persons compared with uninfected persons
- Meta-analysis of studies
 - 67% HIV infected persons had reduced BMD (OR 6.4)
 - 15% HIV+ had osteoporosis (OR 3.7)

Inflammatory Biomarkers Associated With Bone Fracture

Incidence Rate (per 1000 Person-Years) of Fracture by Quartiles of Inflammatory Marker

Inflammatory marker	Q1	Q2	Q3	Q4
CRP	13.5	13.7	16.5	17.4
IL-6	14.2	15.6	13.0	17.5
TNF α	12.5	15.1	14.6	20.8†
IL-2sR	10.9	13.8	15.9	25.4§
IL-6sR	12.0	13.6	17.6	22.3‡§
TNF sRI	14.0	10.5	14.8	26.7‡§
TNF sRII	8.6	15.9	17.9	22.3

† P<.05 from trend test.
‡ P<.01 from trend test.
§ P<.001 from trend test.

Cauley JA et al. *J Bone Miner Res*. 2007;22(5):1088-1095.

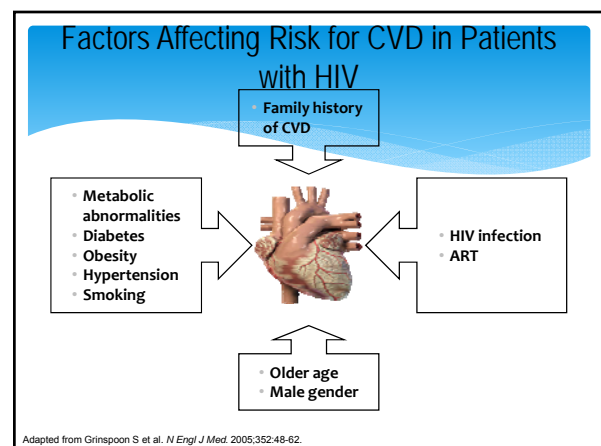
25-OH Vitamin D Deficiency Is Prevalent in HIV+ Patients

- 47% Boston outpatient HIV clinic (n=57)¹
 - Low vitamin D intake in 31% \leq 50 years and 76% 51-70 years
- Low calcium intake in 37% \leq 50 years and 71% 51-70 years
- 81% Italian HIV treatment-experienced patients (n=48)²
- 86% in Spanish cohort of men (n=30)³
 - Mean 25-OH vitamin D level 14.3 ng/ml in healthy controls vs 11.4 ng/ml (P=.044)

1. Rodriguez M et al. *AIDS Res Hum Retroviruses*. 2009;25(1):9-14.
2. Seminaro E et al. *HIV Med*. 2005;6:145-150.
3. Garcia Aparicio AM et al. *Clin Rheumatol*. 2006;25(4):537-539.

Monitoring Bone Disease in HIV+ Patients

- HIV+ patients should be assessed for risk factors of bone disease:
 - Age
 - Sex
 - Weight/height
 - History of fracture
 - Secondary causes of BMD loss/fracture (eg, other disorders, alcohol/tobacco use)
- DXA should be performed in all HIV+ men \geq 50 years of age and postmenopausal women and/or HIV+ patients with a history of fracture
- Patients should be evaluated for any secondary causes of BMD loss
- If DXA results do not indicate need for treatment, lifestyle changes should be recommended and DXA should be repeated every 2-5 years
- DXA should be repeated every 1-2 years for patients in whom bisphosphonate or other treatment for BMD loss is needed



Cardiovascular Disease in the HIV Positive Population

- * Cardiovascular (CV) disease has emerged as a health concern in the aging HIV-positive population as HAART can provide durable clinical benefit and improved survival
- * Contributes to more than 10% of deaths among HIV positive individuals
- * Factors that affect CV risk are similar for HIV positive and negative individuals
 - * Risk may vary among ARV agents

IDSA Guidelines: General Approach to CV Risk in HIV Positive Patients

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    graph TD
      A[Obtain fasting lipid profile, prior to starting antiretrovirals and within 3 to 6 months of starting new regimen] --> B[Count number of CHD risk factors and determine level of risk. If ≥2 risk factors, perform a 10-year risk calculation]
      B --> C[Intervene for modifiable nonlipid risk factors, including diet and smoking]
      C --> D[If above the lipid threshold based on risk group despite vigorous lifestyle interventions, consider altering antiretroviral therapy or lipid-lowering drugs]
      D --> E[IF LIPID-LOWERING DRUGS ARE NECESSARY]
      E --> F[Serum LDL cholesterol above threshold, or triglycerides 200-500 mg/dL with elevated non-HDL cholesterol: STATINS]
      E --> G[OR Serum triglycerides >500 mg/dL: FIBRATES]
    
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Dubé MP et al. Clin Infect Dis. 2003;37:613-627. IDSA = Infectious Diseases Society of America.

Calculating Framingham Risk

Third Report of the Joint National Commission on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III)

Risk Assessment Tool for Estimating 10-year Risk of Developing Hard CHD (Myocardial Infarction and Coronary Death)

The [risk assessment tool](#) below uses recent data from the Framingham Heart Study to estimate 10-year risk for "hard" coronary heart disease outcomes (myocardial infarction and coronary death). This tool is designed to estimate risk in adults aged 20 and older who do not have heart disease or diabetes. Use the calculator below to estimate 10-year risk.

Age: years

Gender: Female Male

Total Cholesterol: mg/dL

HDL Cholesterol: mg/dL

Smoker: No Yes

Systolic Blood Pressure: mmHg

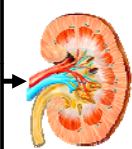
Currently on any medication to treat high blood pressure: No Yes

Available at: <http://hp2010.nhlbin.net/atpi/calculator.asp?usertype=prof>. Accessed September 25, 2008.

Risk Factors Contributing to Development of Kidney Disease

Modifiable risk factors

- Diabetes mellitus
- High blood pressure
- Kidney stones
- Inflammation (eg, glomerulonephritis)
- Allergic reactions to medications (eg, antibiotics)
- Medications
 - eg, NSAIDs
- Drug abuse
- Use of creatine, testosterone, hGH



Nonmodifiable risk factors

- Age
- Family history of kidney disease
- Trauma or accident
- Presence of other diseases
 - HIV/AIDS, hepatitis C, lupus, sickle cell anemia, cancer, congestive heart failure


Adapted from KDOQI CKD Guidelines. http://www.kidney.org/professionals/KDOQI/guidelines_ckd/p7_risk_g13.htm. Accessed July 5, 2010.

Renal Function Evaluation: Complementary Ways to Monitor Kidney Function


- Serum creatinine
- Creatinine clearance (calculated by Cockcroft-Gault [CG])
- GFR (calculated by MDRD)
- 24-hour urine test
- Urinalysis
 - Dipstick to screen for albuminuria or proteinuria
- Microalbuminuria
 - 24-hour urine for albumin
 - Microalbuminuria/creatinine ratio in a spot specimen
- Proteinuria
 - 24-hour urine test for protein
 - Protein/creatinine ratio in a spot specimen

KDOQI CKD Guidelines. http://www.kidney.org/professionals/KDOQI/guidelines_ckd/toc.htm. Accessed June 24, 2010.

Estimating GFR: Similar Serum Creatinine Levels Do Not Mean Similar GFRs



Plasma Creatinine:
1.4 mg/dL



	White Male, 25, 210 lb	Black Female, 86, 115 lb
CG	108	52
MDRD	66	46
CKD-EPI	69	39

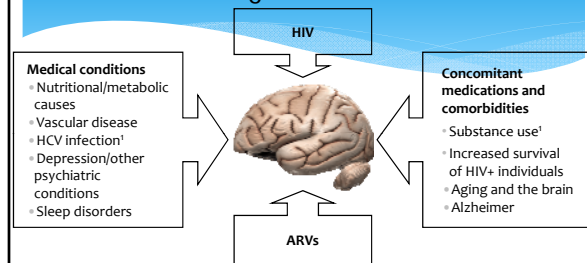
HIV and Age as Renal Risk Factors

- * Among 1758 HIV-infected patients enrolled in ACTG studies
 - * 30% of patients had low baseline glomerular filtration rate (GFR)^a
 - * Median age was significantly higher in patients with low versus normal GFR
 - * 42 vs 36 years, respectively; $P < .0011$
- * In the EuroSIDA cohort, the rate of chronic renal failure^b at baseline ranged from 3.5% to 4.7% depending on the method of GFR calculation
 - * By multivariate analysis, age was a strong predictor of chronic renal failure at baseline
 - * OR 5.47, 95% CI 4.4-6.72; $P < .00012$

Calculate A.S.' Renal Function

- * Glomerular Filtration Rate (GFR): MDRD
- * Creatinine Clearance: Cockcroft-Gault
- * A.S.' weight 187 lbs, height 5'3", BMI 34.2

Multifactorial Etiology of HIV-Associated Neurocognitive Conditions



Adapted from Valcour VG, et al. *J Acquir Immune Defic Syndr*. 2006;43(4):405-10.
Gonzalez R, Cherner M. *Int Rev Psychiatr*. 2008;20(1):49-60.

Neuropsychological Impairment, HIV, and Older Age

- * In a cross-sectional analysis of 202 HIV-positive patients enrolled in the Hawaii Aging With HIV Cohort:
 - * HIV-associated dementia was more frequent in adults aged >50 years vs those 20-39 years old
 - * OR 2.13, 95% CI 1.02-4.44
 - * After adjusting for education, race, drug use, ART status, viral load, CD4 count, and Beck Depression Inventory score, risk of HIV-associated dementia was even higher among older patients
 - * OR 3.26, 95% CI 1.32-8.07

Valcour VG, et al. *Neurology*. 2004;63(5):822-827.

Cancer Prevention in Persons Living with HIV

- * Smoking cessation
- * Hepatitis prevention and treatment
- * Screening: current guidelines in HIV-infected persons
 - * Colonoscopy: age 50 years, then every 10 years
 - * Earlier if strong family history
 - * Mammography: annually after age 50
 - * Age 40 depending on individual risk/benefit assessment
 - * Cervical Pap: annually after 2 normal tests in first year after HIV diagnosis
 - * More frequent if abnormal Pap

Aberg J, et al. *Clin Infect Dis*. 2009;49:651-681.

HIV Primary Care Coordination: Referrals and Consultations for A. S.

- * Supervising Physician
- * Orthopedic Provider
- * Cardiology
- * Nephrology
- * Neurology
- * Mental Health Provider

Case Study: A.S. Current Status

- * Hepatitis A,B,C negative
- * HgB: 9.3
- * Hct: 29.7%
- * CD4: 844/50.8%
- * HIV RNA: 26 copies
- * BUN: 43.0
- * Creatinine: 2.8
- * HgBA1C: 5.9%
- * BUN: 43.0
- * Creatinine: 2.8
- * HgBA1C: 5.9%
- * BP 151/82
- * Weight: 187 lbs
- * BMI: 34.2

What additional questions, laboratory or diagnostic tests would you obtain in management of this patient?

Summary

- * Obtain a comprehensive medical and treatment history for patients in your care
- * Identify and treat common comorbid conditions in people living with HIV/AIDS
- * Make appropriate and timely referrals and consultations for continuity of care for patients with comorbid conditions as needed
- * Coordinate care of the patient living with HIV/AIDS in the Primary Care setting