Dyslipidemia management in the HIV positive individual

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No conflicts of interest
Objectives

- Review the ACC/AHA blood cholesterol treatment guidelines and its application
- Discuss cardiovascular risk and management of dyslipidemia in HIV+ individuals using a case based approach
Key features of new guidelines

• No specific LDL-C targets
• 4 groups that benefit from statin therapy
• Development of pooled cohort equations to estimate 10 yr atherosclerotic cardiovascular disease (ASCVD) risk
• Identification of safety considerations in patients receiving statin therapy
Who benefits from statin therapy?

- 4 groups that benefit from statins
  - Clinically evident ASCVD
  - Primary LDL-C levels of $\geq 190$ mg/dL
  - Type 1 or type 2 diabetes mellitus, age 40-75, and an LDL-C level of $\geq 70$ mg/dL
  - a 10-year risk of atherosclerotic cardiovascular disease of $\geq 7.5\%$, according to the new pooled cohort equations, and an LDL-C level of $\geq 70$ mg/dL

Intensity of statin therapy

**High-intensity statin therapy**

- Daily dose lowers LDL cholesterol level by approximately ≥50% on average

**Recommended:** atorvastatin, 40 - 80 mg; rosuvastatin, 20 - 40 mg

**Moderate-intensity statin therapy**

- Daily dose lowers LDL cholesterol level by approximately 30 to <50% on average

**Recommended:** atorvastatin, 10 - 20 mg; rosuvastatin, 5 - 10 mg; simvastatin, 20 - 40 mg; pravastatin, 40 - 80 mg; lovastatin, 40 mg; fluvastatin ER, 80 mg; fluvastatin, 40 mg twice daily; pitavastatin, 2 - 4 mg
What intensity of therapy?

Patients ≥21 yr of age without heart failure (NYHA class II, III, or IV) or end-stage renal disease (undergoing hemodialysis)
Screen for cardiovascular risk factors
Measure LDL cholesterol

Clinical atherosclerotic CVD
- High-intensity statin therapy

Diabetes mellitus (type 1 or type 2) and age of 40–75 yr and LDL cholesterol 70–189 mg/dl
- Calculate 10-yr risk of atherosclerotic CVD
  - If risk <7.5%, moderate-intensity statin therapy
  - If risk ≥7.5%, high-intensity statin therapy

No diabetes mellitus and age of 40–75 yr and LDL cholesterol 70–189 mg/dl
- Calculate 10-yr risk of atherosclerotic CVD
  - If risk ≥7.5%, moderate-to-high-intensity statin therapy

LDL cholesterol ≥190 mg/dl
- High-intensity statin therapy
ACC Guidelines: the positives and the controversies

- Eliminates LDL-C goals
- Inclusion of stroke as an ASCVD risk
- Risk calculator for middle-aged individuals is likely appropriate
- Detailed safety guidelines

- Eliminates LDL-C goals
- Use of the new risk calculator overestimates individuals needing treatment
  - Age is a big driver of the calculator
  - Use in other ethnic groups can overestimate or underestimate risk
- Family history?
- Use “clinical judgment” as needed – guidance is not well outlined
But…

- These guidelines offer opportunity for a patient-centered approach for CVD risk management in primary prevention

- Guidelines are not rules
Management of dyslipidemia in HIV+

- New guidelines are a shift from NCEP/ATP III
  - No specific LDL-C targets
  - Development of pooled cohort equations to estimate 10 yr atherosclerotic cardiovascular disease (ASCVD) risk
  - Very detailed safety considerations identified

- Risk scores have not been validated in HIV+ individuals
Objectives

• Review the ACC/AHA blood cholesterol treatment guidelines and its application

• Discuss cardiovascular risk and management of dyslipidemia in HIV+ individuals using a case based approach
Increased cardiovascular risk in HIV infected individuals

HIV infected individuals have an atherogenic lipid profile:
  - High triglycerides
  - Low HDL-C
  - “Normal” LDL-C
  - Increased small dense LDL

Lipodystrophy → increased dyslipidemia

Increased CV risk - smoking, hypertension, insulin resistance
Cocaine use
Special considerations in management of lipids in HIV+

- Effects of ART drugs on lipids
- Drug interactions between ART agents and lipid lowering agents
- Pre-existing dyslipidemia prior to initiation of ART
Effects of ART drugs on lipids

- **Protease inhibitors** - in general
  - HDL-C may increase with treatment
  - Increased triglycerides → variable; common with ritonavir regimens
  - Increased MI risk (lopinavir/ritonavir)

- **NRTIs**
  - Stavudine → significant metabolic abnormalities
  - Abacavir and didanosine → increased MI risk
  - Tenofovir has few lipid effects

- **NNRTIs** - no significant atherogenic effects on lipids but can raise HDL-C
  - Efavirenz
  - Nevirapine, etravirine → beneficial lipid effects

- Integrase inhibitors, CCR5 antagonists - lipid neutral
# Statins and ART therapy

<table>
<thead>
<tr>
<th>Statin</th>
<th>Protease inhibitors</th>
<th>NNRTIs</th>
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<tbody>
<tr>
<td>Lovastatin</td>
<td>Contraindicated</td>
<td>↓AUC ↓Higher starting doses</td>
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<td>Simvastatin</td>
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<td>Atorvastatin</td>
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<td>Acceptable with monitoring efavirenz, etravirine- ↓AUC</td>
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<tr>
<td>Pravastatin</td>
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<td>Pitavastatin</td>
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<td></td>
<td>No change in AUC with lopinavir/ritonavir</td>
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Pre-existing dyslipidemia prior to initiation of ART

- **Very high LDL-C levels**: LDL-C >190mg/dL
- Familial Hypercholesterolemia
- Premature CVD
- Tendon xanthomas
- Aggressive lipid lowering

Mixed hyperlipidemia with strong family history of premature CAD:
- Familial Combined Hyperlipidemia
  - Genetic defect unknown
  - 2% global population
  - Strong family history of premature CAD
  - Mixed pattern of hyperlipidemia
  - High risk for premature myocardial infarction
General lipid management guidelines still apply!

- **Lifestyle modification**
  - Diet
  - Weight loss

- **Risk factor control**
  - Hypertension
  - Diabetes
  - Smoking cessation