Cholesterol Management in Elderly Patients: A Case Based Approach

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Goals

• Treat Elevated Triglycerides

• Reduce Cardiac Risk
An asymptomatic male

- 78 yo male
- CAD, DM, PAF, RI
- Tchol: 280
- TG: 1788
- HDL: 16
- Cr: 1.8

Meds:
- Fenofibrate 54 mg
- Niaspan 500 mg
- Lovaza 3 tabs twice daily
Treating Triglycerides

- Triglycerides are priority when over 500: Pancreatitis
- Triglycerides are secondary when under 500: Prevention
Lifestyle Modification Critical

TG Levels: AHA 2011

<table>
<thead>
<tr>
<th>Level</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimal</td>
<td>&lt;100</td>
</tr>
<tr>
<td>Desirable</td>
<td>&lt;150</td>
</tr>
<tr>
<td>Borderline</td>
<td>150-199</td>
</tr>
<tr>
<td>High</td>
<td>200-499</td>
</tr>
<tr>
<td>Very High</td>
<td>&gt;500</td>
</tr>
</tbody>
</table>

Diet Advice:

- Borderline, High, Very High TG levels (150-1000)
  - Metabolic
  - VLDL
  - Carb restrict
- Severe TG elevation: >1000
  - Genetic
  - Hyperchylomicronemia
  - Fat restrict

Borderline, High, Very High TG levels (150-1000)
- Metabolic
- VLDL
- Carb restrict

Severe TG elevation: >1000
- Genetic
- Hyperchylomicronemia
- Fat restrict
Secondary Causes of Hypertriglyceridemia

- **Dietary:** alcohol, carbohydrates
- **Hormones:** estrogens
- **Drugs:** atypical antipsychotics, antiretroviral therapy, steroids
- **Diseases:** diabetes, insulin resistance, renal insufficiency, nephrotic syndrome, hypothyroidism
- **Pregnancy**
Fish oil

Lovaza® or Vascepa® 2 tablets twice daily

**Pro’s:**
- ‘Natural’
- Effective

**Con’s:**
- Blood thinning
- Insurance

Vascepa

LOVAZA® is a registered trademark of the GSK group of companies
VASCEPA® is a registered trademark of the Amarin group of companies
Fibrates

**Fenofibrate**

- **Pro’s**
  - Once per day
  - DM: microvascular

- **Con’s**
  - Drug interactions
  - Renal dosing

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*Graph showing 38% reduction in non-traumatic amputations with fenofibrate.*

Niacin

Niaspan

- Pro’s
  - ‘Natural’
  - HDL raising

- Con’s
  - Symptoms
  - Gout, PUD, AF, DM
  - Safety monitoring
Stopping unnecessary meds

- University of Colorado Seniors Clinic (age>=age 75)
- 2000 patients in 2012
- Screened for non-statin cholesterol medications
- Discontinued in patients who were not using for TGs or to get to LDL goal
- 23 drugs were stopped (saving $38K)
- Low percentage were prescribed nonstatin lipid lowering agent, but of those half were unnecessary

The Consultant Pharmacist October 2014
Prevention: Statin in the Elderly

After further lifestyle counseling, and increasing Niaspan, repeat lipid profile on our 78 yo patient:

- Tchol 212
- HDL 32
- TG 300
- LDL 130

• Should patient be put on a statin?
High

CAD < 75 yo
LDL > 190
DM > 7.5%
Risk > 7.5%

Atorva 40, 80
Crestor 20, 40

Non-HDL < 100
LDL < 70
Advanced Testing

Mod

CAD > 75 yo
DM < 7.5%
Risk > 7.5%

Atorva 10, 20
Rosuv 5, 10
Simva 20, 40
Prava 40, 80

Non-HDL < 130
LDL < 100
Advanced Testing

Low

< 7.5%

Family history of CAD
CAC
ABI/PVR
hsCRP

Advanced Testing
Unique risk factors
Coronary Artery Disease

THE MAGNITUDE OF THE PROBLEM:

- Approximately 50% of CAD presents with MI or death
- Conventional risk factors only explain 50-60% of cardiac risk
- 60% of patients presenting with CAD have 0-1 Risk Factor
Traditional Risk Factors Not Sufficient:  
*Who REALLY is at RISK?*

Jim Fixx  
Sir Winston Churchill
Class II Recommendations

- Family history of CHD:
  - Male <55 years old
  - Female <65 years old

- hs-CRP:
  - >/=2.0 mg/L

- CAC score:
  - >/=300 Agatston units or >/=75 percentile for age, sex, ethnicity

- ABI:
  - <0.9
The prevalence and extent of CAC in asymptomatic patients according to traditional risk factors (RFs).

Mortality rate (per 1000 person-years) with increasing CAC according to burden of risk factors (RFs).

Interpretation: Two Approaches

1. Absolute score

<table>
<thead>
<tr>
<th>Calcium Score (2,3)</th>
<th>Implication</th>
<th>Risk of Coronary Artery Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>0*</td>
<td>No identifiable plaque</td>
<td>Very low, generally less than 5 percent</td>
</tr>
<tr>
<td>1-10</td>
<td>Minimal identifiable plaque</td>
<td>Very unlikely, less than 10 percent</td>
</tr>
<tr>
<td>11-100</td>
<td>Definite, at least mild atherosclerotic plaque</td>
<td>Mild or minimal coronary narrowings likely</td>
</tr>
<tr>
<td>101-400</td>
<td>Definite, at least moderate atherosclerotic plaque</td>
<td>Mild coronary artery disease highly likely, significant narrowings possible</td>
</tr>
<tr>
<td>401 or Higher</td>
<td>Extensive atherosclerotic plaque</td>
<td>High likelihood of at least one significant coronary narrowing</td>
</tr>
</tbody>
</table>

2. Adjusted score: >75\textsuperscript{th} percentile high risk
CAC in Asymptomatic Men
JUPITER TRIAL

[Graph showing cumulative incidence over follow-up years for different groups.]

<table>
<thead>
<tr>
<th>Group</th>
<th>No. at Risk</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥70 Rosuvastatin</td>
<td>2,878</td>
<td>2,779</td>
<td>2,684</td>
<td>2,187</td>
<td>1,413</td>
<td>695</td>
<td>474</td>
<td>351</td>
</tr>
<tr>
<td>Placebo</td>
<td>2,817</td>
<td>2,692</td>
<td>2,598</td>
<td>2,113</td>
<td>1,342</td>
<td>705</td>
<td>476</td>
<td>332</td>
</tr>
<tr>
<td>&lt;70 Rosuvastatin</td>
<td>6,023</td>
<td>5,852</td>
<td>5,718</td>
<td>4,363</td>
<td>2,480</td>
<td>1,289</td>
<td>879</td>
<td>632</td>
</tr>
<tr>
<td>Placebo</td>
<td>6,084</td>
<td>5,929</td>
<td>5,765</td>
<td>4,395</td>
<td>2,530</td>
<td>1,259</td>
<td>879</td>
<td>623</td>
</tr>
<tr>
<td>Monitored adverse event</td>
<td>Age 70–97 years</td>
<td></td>
<td>Placebo</td>
<td></td>
<td>Hazard ratio (^{\dagger}) (95% CI)</td>
<td></td>
<td></td>
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<tr>
<td>---------------------------------------------</td>
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<tr>
<td>Any serious adverse event</td>
<td>Rosuvastatin N</td>
<td>622</td>
<td>584</td>
<td>10.93</td>
<td>10.45</td>
<td>1.05 (0.93–1.17)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate (^{\ast})</td>
<td>10.93</td>
<td>10.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muscle weakness, stiffness or pain</td>
<td>Rosuvastatin N</td>
<td>494</td>
<td>467</td>
<td>8.92</td>
<td>8.50</td>
<td>1.04 (0.92–1.19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate (^{\ast})</td>
<td>8.92</td>
<td>8.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Myopathy</td>
<td>Rosuvastatin N</td>
<td>4</td>
<td>3</td>
<td>0.06</td>
<td>0.05</td>
<td>1.31 (0.29–5.84)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate (^{\ast})</td>
<td>0.06</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhabdomyolysis</td>
<td>Rosuvastatin N</td>
<td>1</td>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate (^{\ast})</td>
<td>0.06</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newly diagnosed cancer</td>
<td>Rosuvastatin N</td>
<td>144</td>
<td>155</td>
<td>2.30</td>
<td>2.54</td>
<td>0.91 (0.73–1.14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate (^{\ast})</td>
<td>2.30</td>
<td>2.54</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death from cancer</td>
<td>Rosuvastatin N</td>
<td>18</td>
<td>31</td>
<td>0.27</td>
<td>0.48</td>
<td>0.58 (0.32–1.03)</td>
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</tr>
<tr>
<td></td>
<td>Rate (^{\ast})</td>
<td>0.27</td>
<td>0.48</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gastrointestinal disorder</td>
<td>Rosuvastatin N</td>
<td>665</td>
<td>621</td>
<td>12.41</td>
<td>11.71</td>
<td>1.06 (0.95–1.18)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate (^{\ast})</td>
<td>12.41</td>
<td>11.71</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renal disorder</td>
<td>Rosuvastatin N</td>
<td>222</td>
<td>191</td>
<td>3.63</td>
<td>3.17</td>
<td>1.14 (0.94–1.39)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate (^{\ast})</td>
<td>3.63</td>
<td>3.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bleeding</td>
<td>Rosuvastatin N</td>
<td>127</td>
<td>106</td>
<td>2.04</td>
<td>1.73</td>
<td>1.18 (0.91–1.53)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate (^{\ast})</td>
<td>2.04</td>
<td>1.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatic disorder</td>
<td>Rosuvastatin N</td>
<td>61</td>
<td>59</td>
<td>0.96</td>
<td>0.95</td>
<td>1.01 (0.71–1.45)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate (^{\ast})</td>
<td>0.96</td>
<td>0.95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newly diagnosed diabetes</td>
<td>Rosuvastatin N</td>
<td>82</td>
<td>64</td>
<td>1.30</td>
<td>1.03</td>
<td>1.25 (0.90–1.74)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate (^{\ast})</td>
<td>1.30</td>
<td>1.03</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

\(^{\ast}\) Rates are per 100 person-years

\(^{\dagger}\) Hazard ratios compare hazards in the rosvastatin group to placebo
PROSPER

![Graph showing the proportion of events with Placebo and Pravastatin](image)

- Placebo
- Pravastatin

Number at risk:
- Placebo: 2913 2832 2748 2651 2560 2458 2128 730 44
- Pravastatin: 2891 2812 2738 2655 2562 2483 2167 770 40

$p=0.014$
<table>
<thead>
<tr>
<th>Event Description</th>
<th>Pravastatin (n=1306)</th>
<th>Placebo (n=1259)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Secondary prevention</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHD death, non-fatal MI, and fatal or non-fatal stroke</td>
<td>227</td>
<td>273</td>
</tr>
<tr>
<td>CHD death, non-fatal MI</td>
<td>166</td>
<td>211</td>
</tr>
<tr>
<td>Fatal and non-fatal stroke</td>
<td>74</td>
<td>69</td>
</tr>
<tr>
<td>TIA</td>
<td>47</td>
<td>64</td>
</tr>
<tr>
<td><strong>Primary prevention</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHD death, non-fatal MI, and fatal or non-fatal stroke</td>
<td>181</td>
<td>200</td>
</tr>
<tr>
<td>CHD death, non-fatal MI</td>
<td>126</td>
<td>145</td>
</tr>
<tr>
<td>Fatal and non-fatal stroke</td>
<td>61</td>
<td>62</td>
</tr>
<tr>
<td>TIA</td>
<td>30</td>
<td>38</td>
</tr>
</tbody>
</table>
Conclusions:

- **Triglycerides: Lifestyle modification critical:**
  - Diet: Very low carb for most elevated TGs
  - Remember secondary causes of high TG (DM, Eth)h
  - Medications: Always when TG > 500
  - Agent selection: Fish oil and Fibrates first line

- **Cardiovascular prevention:**
  - Current ACC/AHA guidelines appropriate
  - Data in elderly patients is limited
  - Risk assessment in rare patients, but useful for children and grandchildren