Patients with LDL-C > 190 mg/dl: When is ASCVD Risk Based on More Than Just a Number?

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Answer:
Answer: Always
Issues to Consider

Population-Based Risk vs Individual Risk
Issues to Consider

Population-Based Risk vs Individual Risk

Individual risk is essentially yes/no
Vast Differences in CHD Risk that Cannot Easily be Discerned
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25 yo male with FH

LDL-C 280 mg/dl

Started treatment at 18 yo

LDL-C 100 mg/dl

MI at 25 years old
### Vast Differences in CHD Risk that Cannot Easily be Discerned

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>FH</th>
<th>LDL-C Initial</th>
<th>LDL-C Current</th>
<th>Treatment History</th>
<th>CHD Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 yo</td>
<td>Male</td>
<td>FH</td>
<td>280 mg/dl</td>
<td>100 mg/dl</td>
<td>Started at 18 yo</td>
<td>MI at 25 years old</td>
</tr>
<tr>
<td>76 yo</td>
<td>Female</td>
<td>FH</td>
<td>454 mg/dl</td>
<td>454 mg/dl</td>
<td>Poor compliance</td>
<td>Elevated CAC score 370, No CHD events</td>
</tr>
</tbody>
</table>
Issues to Consider

10-year risk vs Lifetime risk
Issues to Consider

10-year risk vs Lifetime risk

Both are important, but may not be congruent
Potential Parameters that May be Useful to Improve CHD Risk Prediction

Laboratory
  hsCRP
  Homocysteine
  Lipoprotein(a)

Family History

Markers of Flow/Imaging
  Ankle-Brachial Index (ABI)
  Carotid IMT
  CT coronary calcium score
<table>
<thead>
<tr>
<th>Reclassification Characteristic</th>
<th>Color Code</th>
<th>Cases</th>
<th>Non Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up</td>
<td></td>
<td>14%</td>
<td>2%</td>
</tr>
<tr>
<td>Down</td>
<td></td>
<td>6%</td>
<td>1%</td>
</tr>
<tr>
<td>Difference</td>
<td></td>
<td>8%</td>
<td>1%</td>
</tr>
<tr>
<td>Net Reclassification</td>
<td></td>
<td></td>
<td><strong>7%</strong></td>
</tr>
</tbody>
</table>

The NRI is the difference in proportions moving up and down among cases vs controls, or \( \text{NRI} = [\text{Pr}(\text{up } | \text{ case}) - \text{Pr}(\text{down } | \text{ case})] - [\text{Pr}(\text{up } | \text{ control}) - \text{Pr}(\text{down } | \text{ control})]. \)
Evidence for Lp(a) as an Independent, Causal, Genetic Risk Factor for CVD

Distribution of CAC Scores by Age and Risk Factor Burden

Kaplan–Meier estimates of CHD and CVD events by CAC burden in the Framingham population

(CHD = recognized MI and death from CHD)

(CVD = recognized MI, death from CHD, and ischemic stroke)
Seven Year Risk of Nonfatal MI or CHD Death in Subjects Stratified by Framingham Risk and CAC Score

CAC added to models with age, gender, ethnicity, and risk factors alone resulted in net reclassification of 0.25 (P<0.001). 23% of subjects with events were reclassified as high risk and 13% without events were reclassified as low risk.

Polonsky, et al: JAMA 2010
Reclassification of CHD Risk by Coronary Calcium Score Added to Framingham Risk

MESA (Multi-Ethnic Study of Atherosclerosis)

Rotterdam study

JACC 2014;63(17):1703-1714
Distribution of CAC According to Statin Eligibility Criteria

MESA: 4758 men/women, 45-84 yo (mean 59 ± 9), without known CVD at enrollment
Median F/U 10.3 yr (9.7 to 10.8). CAC=0 in 44% of statin eligible (recommend/consider)

Area Under the Curve for Risk Factors + CAC Score

DOI: 10.3978/j.issn.2223-3652.2012.06.04
CAC Score and 15-Year Mortality with and Without Family History of CHD

Greatest benefit in subjects > 60 yo