Abstract: P3412

Risk factors, biomarkers and framingham risk estimate fail to identify presence of subclinical atherosclerosis in young individual with family history of premature coronary artery disease

Authors:
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Topic(s):
Risk Factors and Prevention – Cardiovascular Risk Assessment

Introduction: Patients with family history of premature coronary artery disease (CAD) are at increased risk of CAD events at a younger age. Risk factor based approaches and clinical evaluation are most commonly used to assess these individuals. However, it has been recently shown that up to 50% of individual presenting with their first myocardial infarction (MI) were considered to be "low risk" prior to that event. MI is often a result of plaque rupture preceded by progression of subclinical atherosclerosis. Detection of subclinical atherosclerosis may therefore help target prevention of plaque progression. We assessed the value of clinical risk factor, biomarkers and Framingham Risk Score (FRS) in predicting subclinical atherosclerosis in individuals with a family history of premature CAD.

Methods: From 310 referrals, 222 individuals between the ages of 35 and 55 with a family history of premature CAD (CAD events in first-degree family members (male < 55, female < 65)) were enrolled for evaluation of risk of CAD. Those with familial hypercholesteremia (possible, probable or definite) were excluded. Patients underwent clinical and risk factor evaluations as well as Cardiac CT or Calcium Score (CS) to assess presence of subclinical / clinical atherosclerosis at the discretion of the treating physician.

Results: In this pilot, 141 individuals (59% male, mean age 45.9 ± 6.0 years) completed evaluation, and 65 (46%) had evidence of subclinical atherosclerosis on CT coronary angiography or CT calcium score with a mean segment involvement score (SIS) of 2.8 and mean CS of 152, putting them above the 80th percentile for their age and sex. Aside from male sex, age, and smoking history, other traditional risk factors and biomarkers including diabetes mellitus, hypertension, total cholesterol, LDL-C, HDL-C and Cholesterol/HDL-C were not significantly different between those with or without subclinical atherosclerosis (Table 1).

Conclusion: In young individuals with a family history of premature CAD, risk factors, biomarkers, and FRS failed to identify individuals with premature, subclinical atherosclerosis in this pilot study. Detection of subclinical atherosclerosis and early implementation of treatment with the aim of stabilizing plaques and stopping progression might prove vital in reducing events in these individuals. Further studies are warranted.
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<table>
<thead>
<tr>
<th></th>
<th>Positive for atherosclerosis (%)</th>
<th>Negative for atherosclerosis (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>65 (46%)</td>
<td>76 (54%)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>49 (73%)</td>
<td>34 (45%)</td>
<td>0.0002</td>
</tr>
<tr>
<td>Mean Age (years)</td>
<td>47.3</td>
<td>44.7</td>
<td>0.01</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>4 (6%)</td>
<td>3 (4%)</td>
<td>0.6</td>
</tr>
<tr>
<td>Hypertension</td>
<td>12 (18%)</td>
<td>11 (14%)</td>
<td>0.5</td>
</tr>
<tr>
<td>Mean Total Cholesterol (mmol/L)</td>
<td>5.26</td>
<td>5.31</td>
<td>0.8</td>
</tr>
<tr>
<td>Mean LDL-C (mmol/L)</td>
<td>3.23</td>
<td>3.28</td>
<td>0.8</td>
</tr>
<tr>
<td>Mean HDL-C (mmol/L)</td>
<td>1.33</td>
<td>1.34</td>
<td>0.8</td>
</tr>
<tr>
<td>Mean Cholesterol/HDL-C ratio</td>
<td>4.21</td>
<td>4.14</td>
<td>0.8</td>
</tr>
<tr>
<td>Smoking (Active / previous)</td>
<td>9 (14%)</td>
<td>2 (3%)</td>
<td>0.02</td>
</tr>
<tr>
<td>Mean SIS score</td>
<td>2.85</td>
<td>-</td>
<td>-</td>
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</tbody>
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